Able UK Marine Energy Park (AMEP): South Humber Bank

Environmental Scoping Report

September 2010

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ERM

Able UK Ltd.

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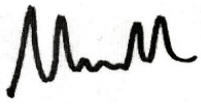
Environmental Scoping Report

September 2010

ERM Reference 0119511

For and on behalf of:
Environmental Resources Management (ERM)

Approved by: Mr. Steve Purnell

Signed: 

Position: Partner

Date: 17th September 2010

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CONTENTS

1 INTRODUCTION

1.1 BACKGROUND TO THE SCOPING REPORT

1.1.1 This Scoping Report has been prepared on behalf of Able UK Ltd ("Able"). It has been prepared as part of the process of undertaking an Environmental Impact Assessment (EIA) of Able's proposal to construct and operate a new quay with associated onshore facilities and a biomass power plant (collectively referred to as the *Able Marine Energy Park*, or AMEP) on the south bank of the River Humber, north of Immingham in North Lincolnshire.

1.1.2 The site of the proposed development is approximately 4 km north-west of Immingham and approximately 11 km north-west of Grimsby. The site is wholly within the administrative area of North Lincolnshire Council, approximately 1.2 km from its border with North East Lincolnshire Council. The proposed development location is shown in *Figure 1.1* and the proposed indicative development layout is shown in *Figure 1.2.*

1.1.3 The main components of the proposed development include:

- a new quay (approximately 1,630 m long), mostly of solid construction and built of tubular and sheet steel driven piles, with associated onshore facilities to accommodate wind turbine manufacture, assembly and installation as well as the associated supply chains;

- wind turbine assembly and testing capabilities, incorporating two operational wind turbines on the site;

- a 299 MW biomass plant at the south-west of the site, capable of supplying sufficient electricity for 500,000 homes, with associated conveyors, fuel storage, cooling water system and an electricity substation; and

- a helipad situated on the proposed project site to facilitate helicopter flights - the exact location, design and operating capacity of the helipad is yet to be determined.

1.1.4 Amongst other things, the proposed development will also include the following:

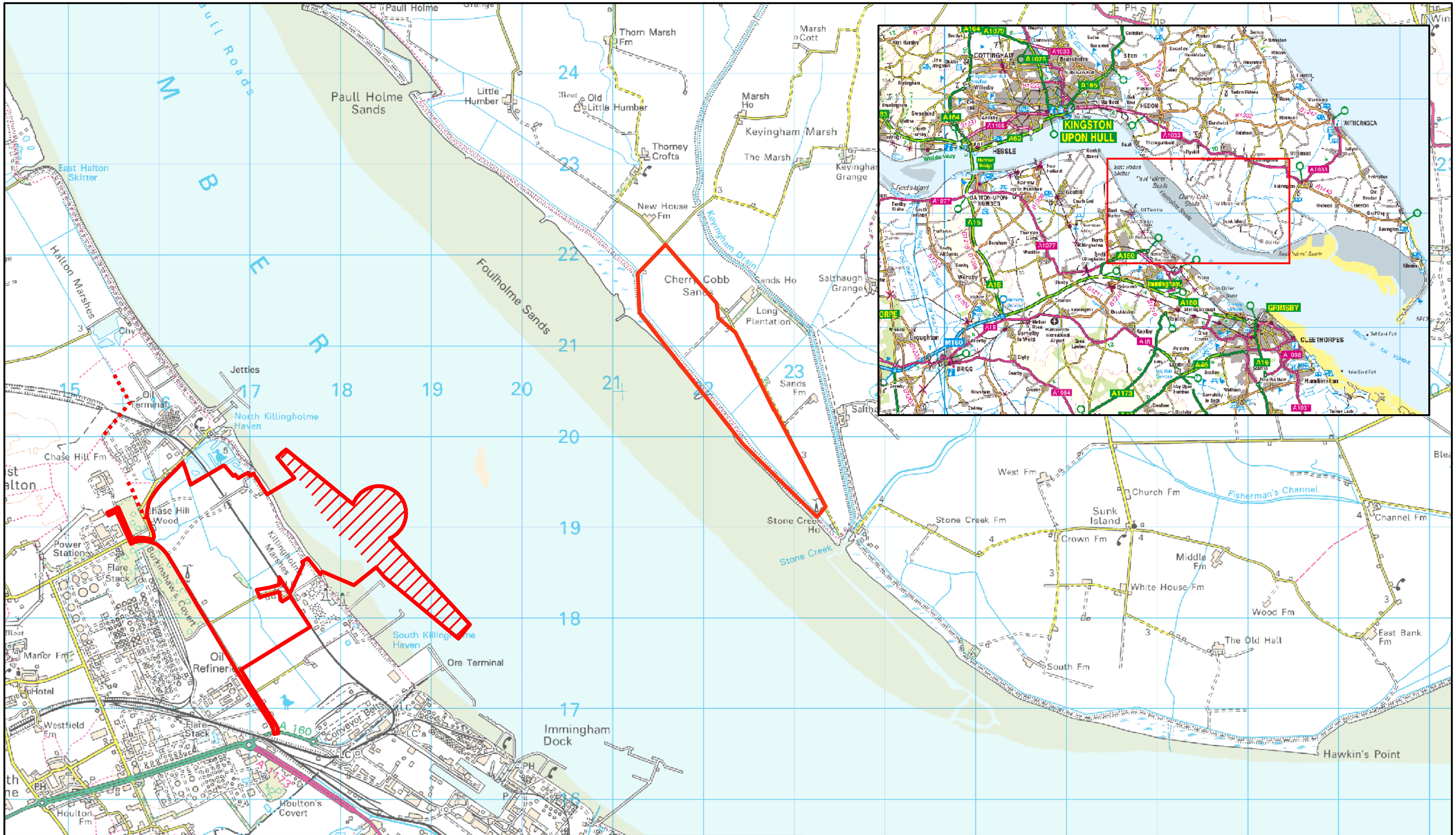
- ancillary plant, equipment and buildings;
- internal roads plus car and HGV parking;
- security fencing;
- landscaping of land within the site boundary;
- changes to access from Rosper Road;
- diversion of existing public footpaths around the site;
- connection to the electricity grid infrastructure;
- surface water management systems and foul drainage provision;
- lighting and other aids to navigation; and
- ecological mitigation areas.

1.1.5 *Chapter 3* of this Report provides a more detailed description of the key components of the proposed development.

1.1.6 This project is being specifically developed to support the implementation of Government policy in two separate areas: biomass and offshore wind energy (*draft NPS EN-1* and *EN-3*). The proposed development forms a key part of meeting the Government's strategy for achieving the targets for renewable energy provision in the UK, as described further in *Chapter 3*.

1.1.7 Due to the fact that the proposed quay will be capable of handling more than 5 million tonnes of bulk cargo annually, and the proposed biomass plant will generate more than 50 MW of electricity, the proposed development incorporates two "*nationally significant infrastructure projects*" (NSIPs). Therefore, under the provisions of The Planning Act 2008 (Chapter 29), it will be necessary for Able to make an application, or applications, for a Development Consent Order (DCO) to the Infrastructure Planning Commission (IPC) in order to authorise its construction and operation.

1.1.8 The application(s) for a DCO will include an Environmental Statement (ES), prepared in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (SI 2009 No. 2263) ("2009 EIA Regulations"). For NSIPs, the 2009 EIA Regulations implement European Directive 85/337/EEC as amended by 97/11/EC on assessing the effects of certain public and private projects on the environment.



KEY:

- Proposed Development Boundary
- Area of Dredging
- Route of Diverted Footpath

0 0.5 1
Kilometre

CLIENT: Able UK Ltd.	SIZE: A4	TITLE: Figure 1.1 Proposed Development Location

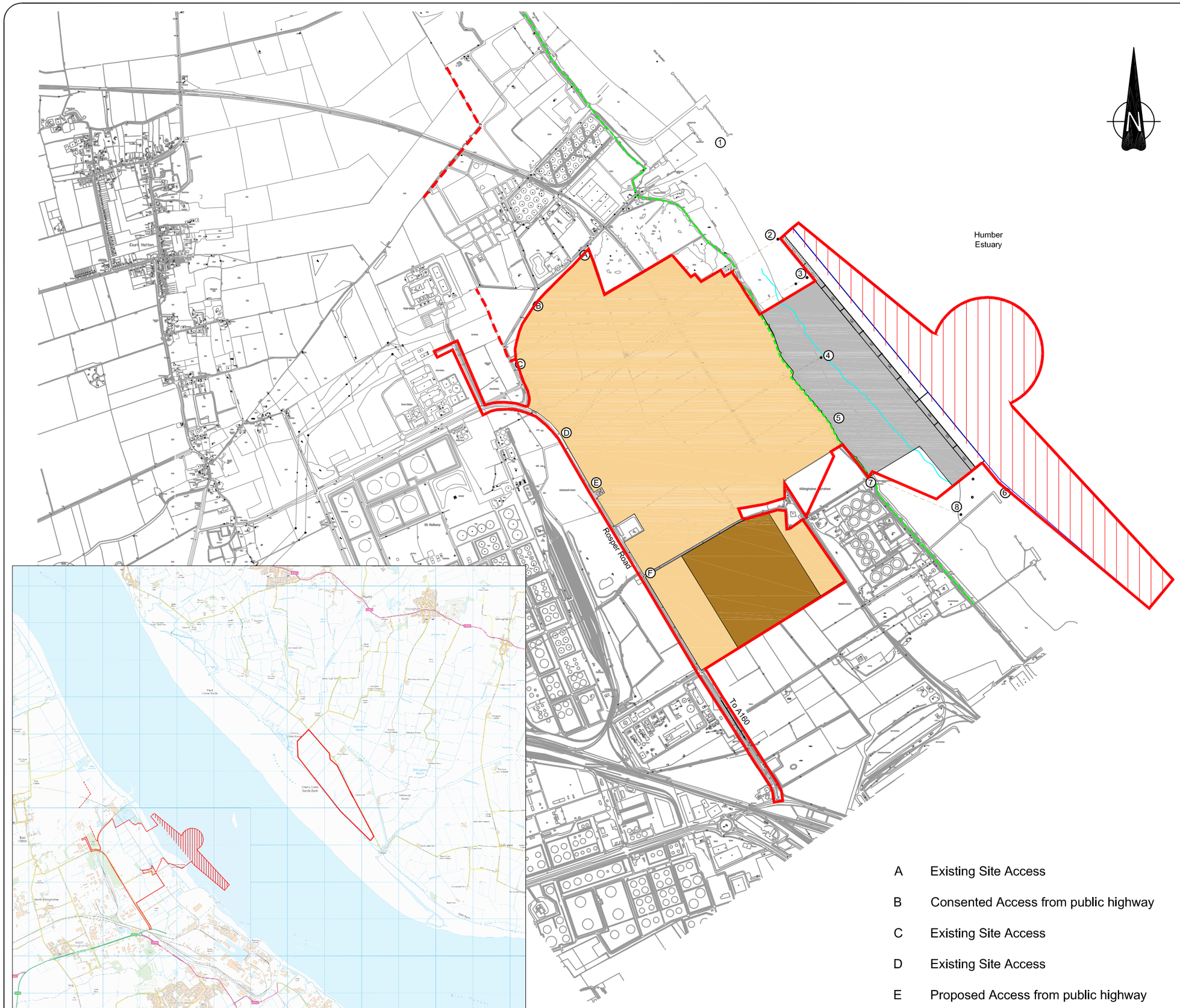
ERM
Eaton House
Wallbrook Court
North Hinksey Lane
Oxford OX2 0QS
Telephone: 01865 384800
Facsimile: 01865 204982

DATE: 16/09/2010	CHECKED: WB	PROJECT: 0119511
DRAWN: IG	APPROVED: SP	SCALE: 1:60,000

SOURCE: Reproduced from Ordnance Survey digital map data.
PROJECTION: British National Grid

DRAWING: LocationMapZoomIn.mxd
REV: 0

File: 0119511Able_CH_WB\MAPS\LocationMapZoomIn.mxd



KEY

- Marine Development (55.4ha) (Intertidal: 22.8ha Subtidal: 32.6ha)
- Suspended Quay (0.8ha)
- Area for Manufacturing (217ha)
- Area for 299MW Biomass Power Station (30ha)
- Dredge Area
- Existing Footpath
- Footpath Diversion
- Mean Low Water

1 HST Berth
2 Centrica CWI/Outfall
3 EON CWI/Outfall
4 Anglian Water Outfall
5 Existing NELDB Outfall
6 Killingholme Oil Jetty
7 NELDB Pumping Station
8 Proposed Anglian Water Outfall

A Existing Site Access
B Consented Access from public highway
C Existing Site Access
D Existing Site Access
E Proposed Access from public highway
F Existing Access

Rev	Date	Description	By	Chk	App
F	17/09/10	Boundary Ameneded	RK	RC	RC
E	13/09/10	Boundary Ameneded	RK	RC	RC
D	01/09/10	Boundary Ameneded	RK	JM	PMS
C	21/07/10	Quay Alignment Amended	RK	PMS	PMS
B	14/07/10	Recess added	PP	PMS	PMS
A	04/06/10	Preliminary Issue	RK	RC	RC

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Project: ABLE Marine Energy Park

Client: ABLE UK Ltd

Title: Indicative Masterplan

PRELIMINARY

Scale:	Drawn By	Checked By	Approved By
1:20,000@A3	R Keirl	R Cram	R Cram
Date:	04/06/2010	04/06/2010	04/06/2010

Drawing No. AME - 02003

Revision: F

1.1.9 This Scoping Report has been produced in accordance with various guidance documents, including the following:

- ERM (2001) *Guidance on EIA: Scoping*, prepared for the European Commission, June;
- Environment Agency (2002) *Scoping Guidelines for the Environmental Impact Assessment of Projects*, May; and
- IPC (2010) *Guidance Note 1 on Pre-application Stages (Chapter 2 of the Planning Act 2008)*, Revision 1, 29 March.

1.1.10 In particular, the IPC has recently issued specific guidance on screening and scoping for EIA projects (*Identifying the right environmental impacts – Advice Note 7*). This notes that a Scoping Report, whilst not a mandatory document, is advisable and should include, amongst other things, the following information:

- a plan to identify the land;
- a description of the development;
- a description of the setting and surroundings of the scheme;
- details of the alternatives looked at and how the preferred scheme was arrived at;
- the assessment methodology and significance criteria framework;
- the likely mitigation measures to be adopted and subsequent residual impacts associated with the project;
- the key environmental topics covered;
- the anticipated structure of the ES;
- which effects have been scoped out;
- the potential environmental effects;
- details of any consultation that has been undertaken; and
- confirmation that the reasonable worst case project has been assumed for assessment purposes.

1.1.11 This Scoping Report addresses all the above issues at appropriate points throughout the document.

1.2 PURPOSE OF THE REPORT

1.2.1 The primary purpose of this Scoping Report is to provide information and details on the proposed development that will facilitate the IPC in giving its opinion on the scope of information to be included in the ES. It supports a request to the IPC made under Regulation 8 of the 2009 EIA Regulations. In complying with these regulations this Scoping Report includes the following:

- a plan sufficient to identify the land (see *Figure 1.1*);
- a brief description of the nature and purpose of the proposed development and of its possible effects on the environment (*Chapters 3* and *6*); and
- such other information or representations as the person making the request may wish to provide or make - in this Scoping Report, this information includes, amongst other things, those policies of direct relevance to the proposed development (*Section 4*) and the proposed spatial and temporal scope and methodology proposed for the EIA (*Sections 5* and *6*).

1.2.2 A key objective of this Report is to provide consultees with relevant information on the proposed development and to enable the consultees to identify the key environmental issues from an early stage in the development of the proposed project and allow early recognition of these issues in the evolution of the scheme. The process also facilitates the "scoping out" of any aspects that would not be expected to result in significant adverse environmental effects.

1.2.3 On receipt of the request for a scoping opinion and this Scoping Report, it is understood that the IPC will consult with Able and the relevant consultation bodies. Provided the IPC considers that it has been provided with sufficient information, within 42 days of the date of receipt of the scoping request it will adopt a scoping opinion and send a copy to Able.

1.2.4 It is important to note that the submission of a request for a scoping opinion is a precursor to an intensive and detailed independent assessment of the environmental impact of the proposed development.

1.3 REPORT STRUCTURE

1.3.1 The remainder of this Scoping Report is structured as follows:

- *Chapter 2* provides background to the applicant and gives details of the proposed EIA study team;
- *Chapter 3* gives details of the proposed development, including the site and the surrounding area;
- *Chapter 4* sets out the planning background relevant to the application;
- *Chapter 5* gives an overview of the proposed methodology that will underpin the EIA studies;
- *Chapter 6* describes for each of the relevant environmental topics the broad baseline conditions, the assessment methodology appropriate to that topic, the likely key impacts and the approach to mitigation;
- *Chapter 7* details the consultation already undertaken and provides a summary of the responses received; and
- *Chapter 8* provides a summary of the report, sets out the anticipated structure and content of the ES and describes the next steps in the process.

In addition, *Chapters 9* and *10* contain a glossary and bibliography, respectively, and *Annex A* contains a list of bodies consulted to date.

2 THE APPLICANT, APPLICATION & STUDY TEAM

2.1 ABLE UK LTD

2.1.1 Able UK Ltd is a development company operating from its headquarters on Teesside. It has been in operation for 40 years, and has in that time engaged in extensive redevelopment, land remediation and reclamation, demolition and waste disposal and port operation.

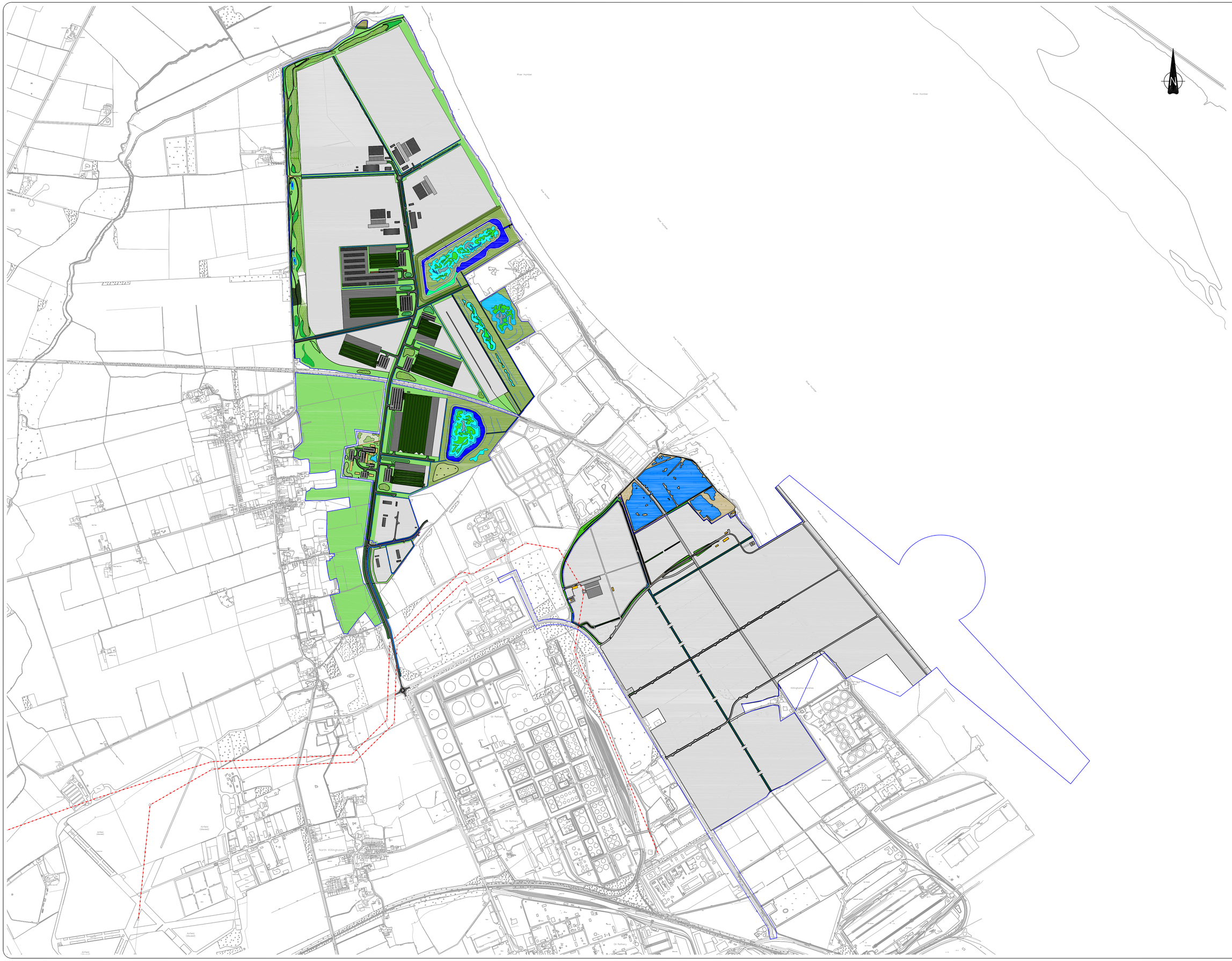
2.1.2 Able has a considerable landholding on the South Humber Bank, the Able Humber Port (AHP) facility, covering approximately 819 ha with extensive deep water river frontage. This landholding, given its proximity to the UK's largest port (Immingham, which is less than 2 km from AHP), its own river frontage, its sheer scale and central UK location, represents a significant resource of national significance. Able's proposed developments on the South Humber Bank are shown in *Figure 2.1.*

2.1.3 The South Humber Bank is one of the last remaining strategic development sites fronting a deep water estuary in the UK and comprises the largest employment land allocation in Yorkshire. It is attracting significant global development interest, with a predicted £3 billion of investment potential over the next 10 years.

2.1.4 To date some £50 million has been invested at the AHP facility. The first phase of AHP development encompassed 118 ha of the 299 ha "southern" site. This is now operational as a major centre for vehicle storage and distribution. GBA, a market leader in the field, are the principal tenants and are handling a wide variety of makes and models.

2.1.5 Able intends to make considerable further investments in developing the combined Logistics and Business Park (to the north of the site) as well as the proposed AMEP development.

2.1.6 The second phase planning application for AHP, covering 380 ha of the larger "northern" site, was submitted in June 2009 and is awaiting a planning decision, currently expected before the end of the third quarter of 2010. The northern site will consist of three separate elements: a Logistics Park, a Business Park and an Industrial Zone.



KEY

Rev	Date	Description	By	Chk	App
B	17/09/10	Boundary Amended	JM	RC	RC
A	31/08/10	Preliminary Issue	RK	RC	RC

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Project: ABLE MARINE ENERGY PARK

Client: ABLE UK Ltd

Title: Scoping Report Fig. 2.1

PRELIMINARY

Scale:	Drawn By	Checked By	Approved By
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Date:	31/08/2010	31/08/2010	31/08/2010

Drawing No. AME - 02008

Revision: B

2.1.7 The Logistics Park covers 380 ha and it is currently proposed (pending a planning decision) that plots will be available for development from 2011 onwards. The plans for the Logistics Park provide for a range of developments designed to cater for services to facilitate the continuing development of the South Humber Bank. These include the creation of transport depots, warehousing and external storage areas, together with offices, a business park and a motel. There will be road and rail links to Immingham Port and the Humber Sea Terminal (HST) and a large part of the site will also provide landscaping and the provision of habitat areas for wildlife and ecology. This land, which is the largest site available for port-related developments in the UK, is earmarked for industrial use in the Local Plan.

2.1.8 The Business Park is being developed to the west of the proposed access road leading to the Logistics Park. The Business Park is designed to accommodate eight office blocks, totalling 8,500 m^2 of office space, on a site 5 ha in size. It is anticipated that enough space will be created for 450 positions of employment.

2.1.9 The Industrial Zone, which extends over 40 ha, is located to the north of two existing gas power stations (owned by E.ON and Centrica). Two extant planning consents provide for the construction of a £200m bioethanol plant and a glass wool factory.

2.1.10 However, the most significant element of the AHP facility is the proposed development of AMEP on the southern site, which will, amongst other things:

- attract new business opportunities to the UK with major prospects within the renewable energy sector including offshore wind turbine manufacture and installation;
- add a competitive dynamic to the UK port industry that currently has only a small number of major players and owners;
- add to overall UK port capacity; and
- be developed and managed as a multi-user facility designed for flexible and varied use, with the potential to exploit bespoke and specialist requirements as well as more conventional port traffic.

2.1.11 A more detailed description of the proposed AMEP facility is provided in *Chapter 3*.

2.2 *APPLICATION DOCUMENTS*

2.2.1 In addition to the scoping opinion and the ES, the full application to the IPC for the proposed development will include as a minimum the following key documents:

- statement as to why AMEP is an IPC project;
- descriptions of the project, location and associated development;
- consultation report;
- draft DCO, and explanatory memorandum;
- land plan, identifying land required for the development etc;
- works plan, showing the location and limits of deviation;
- statement of reasons for compulsory acquisition, and funding statement;
- book of reference;
- report identifying any EU designated sites or Ramsar sites affected;
- plan identifying sites of nature conservation etc and assessment of effects;
- plan identifying sites of the historic environment and assessment of effects;
- flood risk assessment;
- plan identifying Crown land;
- plan identifying changes in access; and
- list of other consents required under other legislation.

2.3 *CONSULTATION TO DATE*

2.3.1 Promoters of projects are encouraged by the IPC to consult as early as possible on their proposed approach to allow time for resolution of any differences between the project promoter and consultees. With this in mind, Able has already undertaken informal consultation and sought feedback from statutory and non-statutory organisations prior to the development of this Scoping Report. An "*Informal Pre-application Consultation Document*" was issued in early July 2010 to a wide range of consultees, with a deadline for receipt of responses by 6th August 2010.

2.3.2 To date Able has consulted with a wide range of stakeholders, including, but not limited to:

- various Parish Councils;
- Government bodies (eg DECC, Environment Agency);
- local authorities (eg North Lincolnshire Council);
- interest groups (eg Natural England, English Heritage); and
- commercial interests (eg Renewable UK).

2.3.3 A more detailed summary of the consultation undertaken to date and the bodies consulted is provided in *Chapter 7* of this Report. A complete list of those bodies consulted during this informal consultation process is included in *Annex A* and where responses have been given; these have been used to inform the preparation of this Scoping Report.

2.3.4 On receipt of the request for a scoping opinion and this Scoping Report the IPC will consult with the statutory consultees to learn of their opinions and views on the proposed development. Having already been consulted during the informal consultation process, it is anticipated that most of the statutory consultees will be familiar with the proposed development and will be in a position to readily provide opinions which inform the scope of the EIA and the design of the proposed development.

2.4 STUDY TEAM

2.4.1 The preparation of the EIA is being led by Environmental Resources Management (ERM) (1), working closely with Able and various specialist consultants. Specific environmental topics and other aspects of the EIA are being addressed by the following:

- *Planning Policy* – Able
- *Geology and Ground Conditions* - Able
- *Estuarine Hydrodynamics* – JBA Consulting
- *Water Quality and Sediment Transport* – JBA Consulting
- *Commercial Fisheries* – Institute of Estuarine Coastal Studies (IECS)
- *Flood Risk Assessment* – JBA Consulting
- *Terrestrial Archaeology* - AC Archaeology Ltd
- *Marine Archaeology* – To be confirmed
- *Commercial and Recreational Navigation* – BMT
- *Traffic and Transport* – JMP Consultants Ltd
- *Socio-economics* – To be confirmed
- *Nature Conservation and Aquatic Ecology* – ERM
- *Terrestrial ecology baseline studies* – Applied Ecology Ltd
- *Marine ecology baseline studies* – IECS
- *Badger surveys* – The Badger Consultancy
- *Noise and Vibration* – ERM
- *Air Quality* – ERM
- *Light Impacts* – ERM
- *Landscape and Visual Impact* – ERM
- *Aviation Impacts* – ERM

(1) Environmental Resources Management Ltd (ERM) is an independent environmental consultancy (www.erm.com).

- *Microwave Links* – ERM
- *Other Wind Turbine Impacts* - ERM

In addition to the above, legal advice to the project is being provided by Bircham Dyson Bell LLP and scheme engineering is being undertaken by Hochtief and Able.

3 THE PROPOSED DEVELOPMENT

3.1 DEVELOPMENT JUSTIFICATION AND NEED

Climate Change and Renewable Energy

3.1.1 There is compelling evidence that the rising levels of greenhouse gases will have a warming effect on the earth's climate through increasing the amount of infrared radiation (heat energy) trapped in the atmosphere - the "greenhouse effect". Current levels of greenhouse gases are higher now than at any time in the past 650,000 years. As a consequence, the global temperature could rise by between 1.1 ºC and 6.4 ºC (IPCC, 2007).

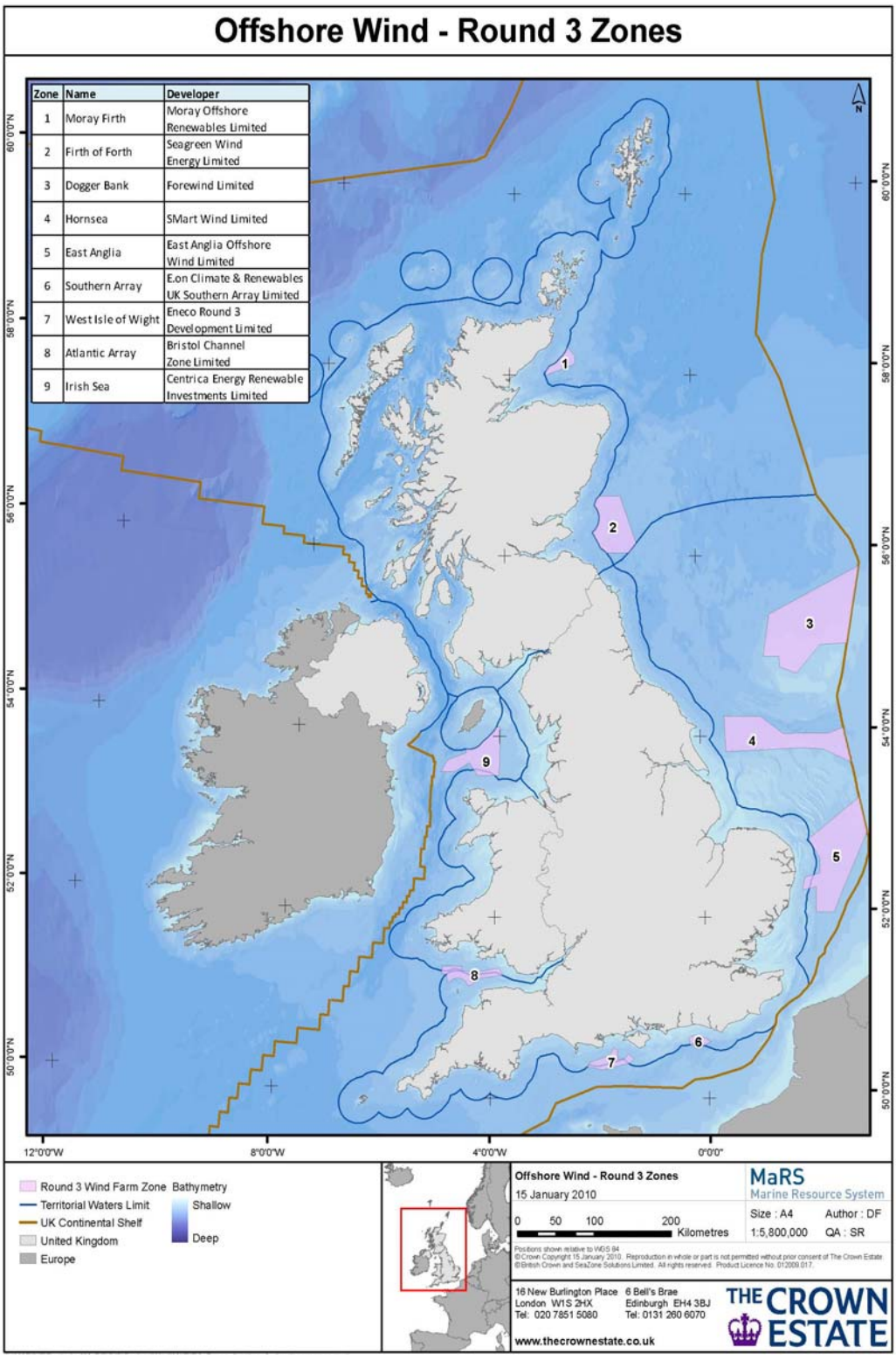
3.1.2 In 2009 the European Parliament issued the Renewable Energy Directive, 2009/28/EC. This Directive establishes a common framework for the promotion of energy from renewable sources and sets mandatory national targets for the overall share of energy from renewable sources. The Directive requires, inter alia, 15 percent of the energy consumed in the UK to come from renewable sources by 2020.

3.1.3 The Climate Change Act 2008 became law on 26th November 2008 and creates a new approach to managing and responding to climate change in the UK. The Act sets an ambitious and legally binding target of at least an 80 percent reduction in greenhouse gas emissions by 2050.

3.1.4 In July 2009 the Government published *The UK Renewable Energy Strategy*, which sets out the path for meeting the legally binding target established by EU legislation. The strategy sets a target for producing more than 30 percent of electricity from renewable sources by 2020, up from about 5.5 percent today. It establishes that most of this renewable energy will be from wind power, on and offshore, with biomass, hydro, wave and tidal also playing an important role.

3.1.5 The Government recently completed a full Strategic Environmental Assessment of offshore energy (DECC, 2009) and concluded that 25 GW of new offshore wind farm development ("Round 3" sites) would be permissible in addition to existing plans for 8 GW of offshore development (Rounds 1 and 2 sites). This step change in government policy will require significant investment in the infrastructure relating to the manufacture, assembly and installation of offshore wind energy.

Figure 3.1 Offshore Wind - Round 3 Zones



Source: http://www.thecrownestate.co.uk/round3_map.pdf

3.1.6 The draft National Policy Statement for Ports was issued for consultation on 9th November 2009. Consultation closed on 15th February 2010. The draft policy recognises the need for port development to support the offshore renewable energy sector through the provision of facilities to construct and transport components to the offshore sites.

The Suitability of the Proposed Development Site

3.1.7 This proposed development is being promoted specifically to support the implementation of Government policy in two separate but related areas: biomass and offshore wind energy (*draft EN-1* and EN-3).

3.1.8 The scheme forms a key part of meeting the Government strategy for achieving the targets for renewable energy provision in the UK. It will be purpose built to accommodate the needs of the renewable energy sector and will positively impact in terms of both offshore wind and biomass related power generation.

3.1.9 As the body with the sole authority to lease the sea bed between the UK territorial limit and the continental shelf, the Crown Estate has conducted three rounds of applications for offshore wind farm sites, the first two of which are under development. Able's proposed development is ideally located for the three largest sites allocated in Round 3 in the North Sea, which between them could support over 20 GW of electricity generation capacity.

3.1.10 The Department for Energy and Climate Change (DECC) issued its UK Offshore Wind Ports Prospectus in September 2009, listing potential port capacity that could supply these offshore sites. Of the potential facilities identified, Able's has the benefit of being the largest in terms of availability of onshore land; large scale development is necessary if a complete supply chain is to operate at a single site, and thus deliver maximum economic and environmental benefits.

3.1.11 The Able site on the South Humber Bank was identified in the Prospectus as being:

> *"…an ideal location for development for both offshore construction and manufacturing. It is located centrally on the east coast with good existing links and it is envisaged that the development will include new quays specified to meet the occupier's requirements"* (page 11).

3.1.12 The scale of the site affords the opportunity to develop an integrated cluster of activity which would incorporate direct manufacture by the original equipment manufacturers and their entire supply chains. This provides maximum opportunities regarding both production efficiencies and employment creation with the associated beneficial impacts upon the local, regional and national economies.

3.1.13 The site is well located as far as the potential for sustainable access is concerned, and in accordance with sustainable transport policy it is expected that both elements of the proposed development will be primarily served by sea and/or rail.

3.1.14 The main characteristics of the site are described further below in the remainder of this *Chapter*.

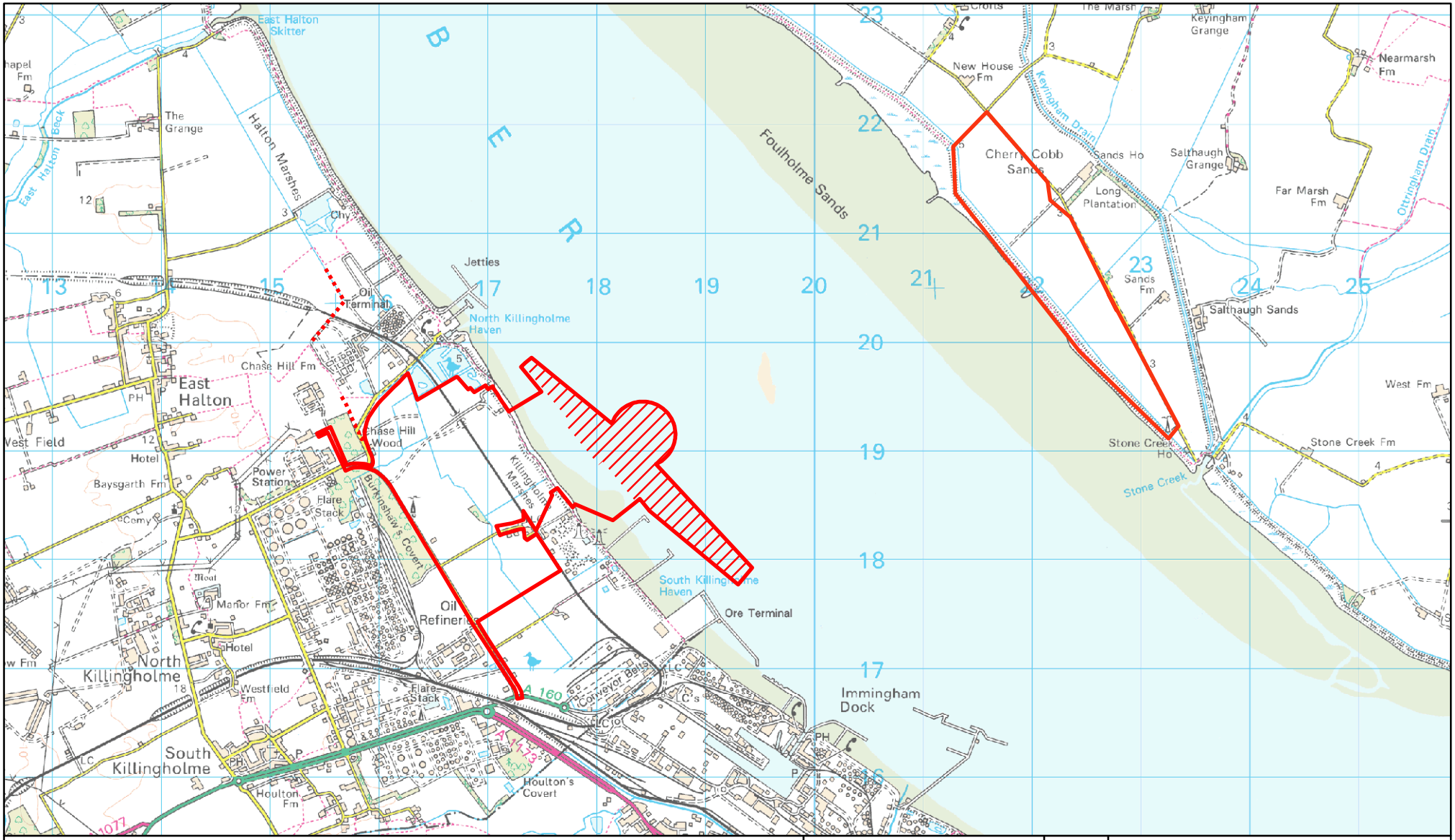
3.2 THE PROPOSED DEVELOPMENT SITE

Site Location

3.2.1 The site is located on the Killingholme Marshes and North Killingholme Haven on the Humber Estuary at approximate grid reference TA 170 190. It is bordered by the Humber estuary, the Killingholme Pits to the north and Burkinshaw's Covert to the west, and is surrounded on three sides by industrial development with some agricultural land uses present (*Figure 3.2*). Currently, hard standing covers approximately 118 ha of the site, which is being used as a vehicle storage area. The southern area of the proposed development site is currently used for agricultural purposes.

3.2.2 Immediately to the north of the site is the Humber Sea Terminal (HST); ABP Immingham Port lies to the south.

3.2.3 The site is bordered by Rosper Road, beyond which is the Total Oil Refinery and Conoco Philips Combined Heat and Power (CHP) Plant. The nearest communities are located in the villages of East Halton and North Killingholme, although there are a few isolated individual houses located on the boundaries of the proposed development site. The centre of Immingham (population c. 12,000) lies approximately 3 km from the southern boundary of the site.



KEY:

- Proposed Development Boundary
- Area of Dredging
- Route of Diverted Footpath

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Kilometre

CLIENT: Able UK Ltd.	SIZE: A4	TITLE: Figure 3.2 Immediate Site Surroundings

ERM
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Oxford OX2 0QS
Telephone: 01865 384800
Facsimile: 01865 204982

ERM

DATE: 16/09/2010	CHECKED: WB	PROJECT: 0119511
DRAWN: IG	APPROVED: SP	SCALE: 1:50,000

PROJECTION: British National Grid

DRAWING: SiteSurroundings.mxd

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The Humber Estuary

3.2.4 The Humber Estuary and its shores accommodate a combination of industrial development and sensitive environmental areas. The estuary drains approximately 20 percent of the total land surface of England and is the largest coastal plain estuary on the east coast of Britain. It is also heavily used by commercial vessel traffic, with some 40,000 ship movements annually.

3.2.5 The ports on the estuary handle around 14 percent of the UK's international trade. Industry alongside the estuary includes chemical works, an oil refinery and power generation. In addition, a planning application was submitted in April 2008 to build the "Humber Gateway", a major offshore wind farm project which would produce enough renewable energy to power up to 195,000 homes.

3.2.6 Alongside the extensive human uses, the Humber supports a rich variety of habitats and species and is recognised as one of the most important estuaries in Europe for overwintering birds as well as supporting nine species of international importance. It is due to the presence of these important habitats and species that the Humber has been granted a number of nature conservation designations under UK, European and International law.

3.2.7 In more recent years flood risk, sea level rise and consequential loss of habitat have become increasingly prominent issues in the estuary. Work by several bodies, including the Environment Agency and local Humberside authorities, on developing strategies and approaches to managing these issues, has been in development for a number of years.

Key Characteristics of the Development Site

3.2.8 A railway line passes through the site, and a redundant sewage works can be found to the west of the site. Former clay pits to the north of the site, which are now flooded, are classified as a Site of Special Scientific Interest (SSSI). The terrestrial area of the development site closest to the foreshore is on low lying ground that is considered to be at high risk of flooding. A raised embankment along the river bank supports a flood defence wall which protects the site from flooding. There is an existing footpath which runs between the existing developed areas and the foreshore. Recent aerial photos of the site are shown in *Figure 3.3*.

Figure 3.3 Existing Site Characteristics

3.2.9 The existing terrestrial area within the AMEP site includes approximately 118ha of land that has the benefit of extant planning consents for port related storage. Development has commenced over much of this area. The remaining terrestrial area on the site comprises

agricultural land that is allocated for industrial development in North Lincolnshire Council's Local Plan.

3.2.10 Elba Securities Ltd currently owns the majority of the land. Other landowners and titles on the proposed site include agricultural landholders, Total Oil and its tenants, Powergen plc and Associated British Ports (ABP), which leases some of the foreshore from the Crown Estate. In addition, E.ON has an easement granted for its power station cooling water outfall pipe.

3.2.11 Since the south bank of the Humber is already extensively industrialised this site, and hence the length of the proposed AMEP quay, is constrained by its neighbours to the north and south, the Humber Sea Terminal and the South Killingholme Oil Terminal respectively.

3.2.12 Other constraints include the presence of four inlets/outfalls in and around the site. Cooling water inlets and outfalls to the north are owned by E.ON and Centrica for their power stations. To the south of these, there is an Anglian Water sludge outfall and a North East Lindsey Drainage Board outfall; it is currently proposed that these two outfalls will be diverted in advance of the AMEP development.

3.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

Key Features of the AMEP Development

3.3.1 As described in *Chapter 1*, the proposed development comprises the following key elements:

- a new quay with associated onshore development;
- wind turbine manufacture, assembly and testing facilities;
- a biomass plant; and
- a helipad.

3.3.2 The proposed development includes the reclamation of approximately 55 ha of inter-tidal and sub-tidal habitat within the Humber Estuary for the new quay development. Associated development will include diversion and alteration of roads and footpaths, diversion of watercourses, construction of new footbridges, ecological mitigation works, works for the accommodation of vessels and the relocation of statutory undertakers' apparatus. Ancillary matters will include the acquisition of land, as described below.

3.3.3 The proposed development will include a new quay of approximately 1,630 m in length to serve the wind energy sector and the on-site biomass power station.

3.3.4 The terrestrial development area covers approximately 223 ha and will comprise large industrial buildings for manufacturing and assembly of offshore wind turbines with extensive areas of open storage for component parts of the offshore turbine structures. A stoned surface will be provided generally in storage areas. The industrial buildings will be steel framed and metal clad, and be similar in appearance to those already erected on the site under existing consents. Floodlighting would be erected to enable work to be undertaken on a 24/7 basis. The lighting would be similar to that already consented and operational on site. Offices with paved parking will be provided for management and administrative staff.

3.3.5 Approximately 150,000 m^2 of manufacturing floor space is proposed as part of the development which will provide the required facilities for original equipment manufacturers. In addition to space set aside for the biomass plant, the remainder of the site will be used for:

- external storage areas for wind turbine components, including towers, blades and nacelles;
- employee car parking; and
- ecological mitigation.

3.3.6 The total number of employees on site is expected to be in excess of 5,000. The offshore wind industry is an emerging high-tech industry which will provide a range of professional, skilled and semi-skilled employment opportunities.

3.3.7 The new quay will provide berthing facilities for vessels up to 10 m draft throughout its length with a short section providing berthing facilities for vessels up to 13.5 m draft.

3.3.8 The AMEP facility will be operational for 24 hours a day, 365 days a year. It is expected that shift working will take place to facilitate continual operations.

Access to the AMEP Site

3.3.9 The site can be currently accessed from an existing junction on Rosper Road and two existing junctions on Haven Road. It is proposed that two new road access points to the site will be created on Rosper Road.

These new road access points, as currently planned, are indicated on the proposed AMEP development layout in *Figure 1.1*.

3.3.10 During both the construction and operational phases, materials will be delivered to the site by a combination of road, rail and sea. The fuel for the operation of the biomass plant will be delivered by vessels to the site using the new quay.

3.3.11 It is currently proposed that a footpath which currently runs along the flood defence bund will be diverted round the edge of the site and possibly also around the Humber Sea Terminal to the north of the site. This option is to be developed in consultation with the local highway authority and other relevant consultees.

3.3.12 It is expected that HGV deliveries to service the site once operational will be between the hours of 0600 and 2200. A Travel Plan will be drawn up to develop site-wide targets for transport, including measures to promote the use of sustainable transport and to reduce reliance on single occupancy car journeys for staff and visitors.

Wind Turbine Construction and Testing Facilities

3.3.13 The proposed development will consist principally of manufacturing facilities for the offshore wind energy industry and a quay facility that will enable turbine components to be loaded onto vessels for transport to the offshore wind farms. Vessel loading will be undertaken by a combination of mobile harbour cranes and self-propelled mobile transporters.

3.3.14 Wind turbine parts are particularly heavy and require a specially adapted quay that can withstand the heavy lifts required to transport them and load them onto vessels. In the future, turbines are likely to increase in size, and become heavier with larger towers, blades and power capacity; hence it will be important for the design of the quay to take this into account to ensure future operability.

3.3.15 It is estimated that each wind turbine needs around 1 ha of quay space for storage and construction (as described in the Crown Estate's *A Guide to an Offshore Wind Farm*). The site area is designed to handle simultaneous assembly and shipping of multiple wind turbines, whether by the same or different manufacturers.

3.3.16 The three principal Round 3 offshore wind areas of Dogger Bank, Hornsea and Norfolk Bank between them have a capacity of around 20,000 MW. Based on the current average turbine capacity (3 MW) this

would require nearly 7,000 turbines. However, even a doubling of turbine capacity to 6 MW would require more than 3,000 turbines to be manufactured and transported offshore; based on currently predicted wind farm development timescales this equates to approximately two turbines a day.

3.3.17 The approach channel to the new quay will be dredged (as necessary) to permit the passage of vessels of 13.5 m draft in order to meet, inter alia, the requirements of Capesize vessels supplying biomass.

3.3.18 During the operation of the AMEP facility, it is expected that the wind turbine materials arriving on site for assembly will mostly arrive by sea. They will arrive either at the new quay directly or through adjacent port facilities. The remaining materials will be delivered by road or rail. Once assembled on site, the individual wind turbines will be shipped directly from the new quay for installation at various offshore wind farm sites in the North Sea or potentially to other emerging markets.

Biomass Facility

3.3.19 The biomass facility will use approximately 2 m tonnes of fuel per year. The primary fuel for the power station will be a combination of wood chips and wood pellets which will be sustainably sourced. It is expected that the biomass will be a combination of wood grown for a specific purpose (eg energy production), wood from cultivated forests (eg wood from thinnings) and residual biomass products from agriculture, timber and forestry operations (eg branches, tops, bark, shavings, chippings and sawdust).

3.3.20 The biomass feedstock will be transported to the site by vessels of various sizes up to the Capesize class, which have a capacity of up to 100,000 tonnes. The feedstock will be off-loaded from the vessels by cranes and transferred to the biomass plant fuel reception and storage area by conveyors.

3.3.21 The biomass feedstock will be stored in an enclosed storage facility which will be designed to hold sufficient biomass for approximately 20 days of operation of the power station. From the storage facility the feedstock will be conveyed via a system of enclosed conveyors to the boiler house.

3.3.22 Fossil fuel in the form of light fuel oil (LFO) will be used during start up. Up to 750 tonnes of LFO will be consumed per year dependent on the number of start ups. On average the power station will have a

maximum of five start ups per year. The on-site storage capacity for LFO is envisaged to be approximately 500 tonnes.

3.3.23 It is expected that significant quantities of ash will be generated by the biomass facility annually. Ash will be stored securely on site prior to regular removal from the site by road, rail or ship. If possible, the intention is to use the ash for a beneficial use either as fertiliser or in the building industry, subject to complying with statutory requirements. The least preferred option will be to landfill the ash.

3.3.24 It should be noted that locating the biomass plant within the AMEP site enables maximum use to be made of the new quay for both the import of biomass feedstock as well as to facilitate the requirements of the wind turbine manufacturing industry.

Helipad Provision

3.3.25 It is also proposed that there will be a helipad located on the AMEP site to facilitate helicopter movements to and from the site. However, the exact location, design and operating capacity of the helipad is yet to be determined.

Land Acquisition

3.3.26 The proposed development would require the compulsory acquisition of some land as well as acquisition from the Crown Estate of land below the mean high water mark. It may also require acquisition of land to provide compensation for habitat that is lost due to the development. Acquisition of other landowners' rights that may exist over Able's land and acquisition of rights over other landowners' land, such as access rights, temporary occupation during construction etc will also be required.

Miscellaneous

3.3.27 Although the biomass plant is below the current 300 MW threshold for electricity generating projects where carbon capture readiness is required to be demonstrated, land is being set aside as part of the development for any additional plant that may be needed for this purpose in the future.

Construction Phase

3.3.28 The proposed AMEP construction phase is envisaged to start in early 2012 and last approximately 24 months; therefore, it is currently planned that the facility would be part operational by early 2014.

3.3.29 The marine facility will be substantially designed as a solid structure abutting the existing deep water channel in the Humber. The perimeter of the infill area will be formed in a combination of revetments and tubular and sheet steel piles driven from barges operating in the river. The area behind the quay frontage will be in-filled with geological or estuarine materials, consolidated and topped off with a stone surface layer. Concreting works would be undertaken along the quay frontage to provide a suspended deck capable of supporting heavy duty harbour cranes.

3.3.30 It is expected that dredging works will be undertaken by a combination of trailing suction hopper dredger and backhoe dredger, depending on material type. The spoil site for disposal of dredge arisings will be agreed with the Humber Harbour Master. However, the intent where possible will be to retain dredged material within the Humber estuary system.

3.3.31 The development site area will provide the location for the construction contractors' facilities such as offices, worker restaurant and washing and toilet facilities as well as temporary material storage.

3.3.32 Terrestrial construction works will include re-grading of existing site levels, installation of services, installation of a foul and surface water drainage system, construction of industrial buildings up to 20 m high, on site roads and areas of hard standing. Piling is likely to be required for the foundations of the industrial structures and may be driven or cast in-situ type.

3.3.33 It is anticipated that there will be approximately 500 direct full-time equivalent jobs generated during the construction phase. Working hours are likely to be typically 0700 to 1900, with extended hours for some activities.

3.3.34 During construction, sea deliveries will make use of the adjacent port facilities. Rail deliveries would utilise the existing rail line that passes through the site.

4 PLANNING AND POLICY CONTEXT

4.1 INTRODUCTION

4.1.1 This section gives an overview of the current and emerging policies relevant to the proposed development at the national, regional and local planning levels, which will be reviewed during the EIA process.

4.1.2 As indicated in *Chapter 3*, the European Union (EU) has allocated targets for energy consumption from renewable sources to each member state, averaging 20 percent of all energy consumption (not just electricity consumption). The UK must increase its renewable energy production from a 2005 level of 1.3 percent of its total energy usage to 15 percent.

4.1.3 Offshore wind will need to play a significant role in the UK's future energy production, and there will be a market for the installation of wind turbines in the North Sea beyond the UK. Current estimates suggest that the Round 3 project alone will require some £100 billion of new investment.

4.1.4 Biomass will also play a key role in achieving these targets as part of a developing mixed renewable energy strategy.

4.1.5 These initiatives at the EU level set the context for much of the policy and legislation that will apply to the proposed AMEP development.

4.2 NATIONAL POLICIES

4.2.1 A series of draft National Policy Statements (NPS) has been prepared, which set out policy on major infrastructure projects in England and Wales. There will eventually be 12 of these documents in all. Three of these are particularly relevant to the proposed development:

- Overarching Energy (*EN-1*);
- Renewable Energy (*EN-3*); and
- Ports.

4.2.2 Consultation has now closed on each of these documents, although the Department for Energy and Climate Change (DECC) has recently confirmed that it will be re-opening consultation on both draft energy NPSs.

4.2.3 Amongst other things, these three NPSs set out the previous Government's policy on the need for biomass and other renewable energy infrastructure at port locations. It is widely anticipated that the previously identified priorities will remain core to the new Government's strategy; indeed, an aspiration to further increase the UK's already challenging 2020 renewable energy target is believed to be under consideration. A precise policy framework designed to deliver this is likely to evolve in the coming months.

4.2.4 However, the need for all forms of electricity generation is unequivocally stated in existing Government policy guidance as significant. The draft NPS EN-1 states on page 14, for example, that "*the IPC should start its assessment of applications for infrastructure covered by the energy NPS's on the basis that need has been demonstrated*". In addition, the Ports NPS states (at paragraph 1.12.1) that "*the decision-maker should accept the need for future capacity [and] support the development of offshore sources of renewable energy*".

4.2.5 In addition to the three relevant draft NPSs, the following national planning and policy documents, amongst others, will all be of relevance to the proposed development and therefore taken into consideration during the EIA process:

- *Project Appraisal Framework for Ports* (2003)
- *Modern Ports: A UK Policy* (2000)
- *Ports Policy Review Interim Report* (2007)
- *UK Renewable Energy Strategy* (2009)
- *UK Offshore Wind Ports Prospectus* (2009)
- *PPS 1: Delivering Sustainable Development* (2005)
- *Planning and Climate Change – Supplement to PPS 1* (2007)
- *PPS 4: Planning for Sustainable Economic Growth* (2009)
- *PPS 5: Planning for the Historic Environment* (2010)
- *PPS 9: Biodiversity and Geological Conservation* (2005)
- *PPS 10: Planning for Sustainable Waste Management* (2005)
- *PPS 12: Local Spatial Planning* (2008)
- *PPG 13: Transport* (2001)
- *Consultation paper on a new Planning Policy Statement 15: Planning for the Historic Environment* (2009)
- *PPG 20: Coastal Planning* (1992)
- *PPS 22: Renewable Energy* (2004)
- *PPS 23: Planning and Pollution Control* (2004)
- *PPS 25: Development and Flood Risk* (2010);
- *PPS 25 Supplement: Development and Coastal Change* (2010)
- *UK Biodiversity Action Plan* (1994)

- *Waste Strategy for England 2007* (2007)
- *Maintenance Dredging & The Habitats Regulations 1994: A conservation assessment protocol* (2007)
- *Freight Route Utilisation Strategy* (Network Rail, 2007).

4.3 REGIONAL PLANNING POLICY

4.3.1 The site for the proposed development lies within the Yorkshire and Humber Region and is covered by the May 2008 Yorkshire and Humber Plan Regional Strategy to 2026. Section 2 of this states that,

> "*Further development of the Humber Ports should be realised within the context of the RSS's objective of maintaining the integrity of internationally important biodiversity sites such as the Humber Estuary cSAC, SPA and Ramsar site*."

4.3.2 Regional Strategies were revoked by the Secretary of State for Communities and Local Government on 6 July 2010. Regional Spatial Strategies no longer form part of the development plan for the purposes of s38(6) of the Planning and Compulsory Purchase Act 2004. The decision by the Secretary of State to revoke Regional Strategies is now the subject of a judicial review. Regional policies will be included in the ES where they directly reference the proposed development, taking into account the following documents:

- *Corporate Plan 2008–2011* (Government Office for Yorkshire and The Humber, 2008);
- *Revised Corporate Plan 2008–2011* (Yorkshire Forward, 2009);
- *Regional Economic Strategy for Yorkshire and Humber 2006–2015* (Yorkshire Forward, 2006);
- *Yorkshire and Humber Plan Regional Spatial Strategy to 2026* (Government Office for Yorkshire and The Humber, 2008);
- *Let's Take it From the Tip – Yorkshire & Humber Region Waste Strategy* (Local Government Yorkshire & Humber, 2003);
- *A Carbon Capture and Storage Network for Yorkshire and Humber* (Yorkshire Forward, 2008);
- *Northern Way Growth Strategy* (Northern Way, 2004);

- *Hull & Humber Ports City Region Development Plan* (Humber Economic Partnership Ltd, 2006);

- *Planning for Rising Tides: Humber Flood Defence Strategy* (Environment Agency, 2008);

- *Humber Management Scheme* (HMS, 2004);

- *Draft Integrated Regional Framework* (Yorkshire and Humber Assembly, 2007); and

- *Regional Transport Strategy* (Yorkshire and Humber Assembly, 2006).

4.4 LOCAL PLANNING POLICY

4.4.1 The site of the proposed development lies wholly within the administrative area of North Lincolnshire Council, a unitary authority. The site forms part of the South Humber Bank Industrial Area, which is:

> "*proposed for industrial development principally because the land is allocated adjacent to a deep water channel of the River Humber. The site therefore has special potential for estuary related industry to locate there*". (North Lincolnshire Council, 2003, Section 5.30)

4.4.2 The following plans, at a local level, will be relevant to the preparation of the ES:

- *North Lincolnshire Local Plan* (North Lincolnshire Council, 2003)

- *North Lincolnshire Infrastructure Delivery Plan* (North Lincolnshire Council, 2010)

- *Lincolnshire Biodiversity Action Plan* (Lincolnshire Biodiversity Partnership, 2006)

- *Local Development Framework Core Strategy Submission Draft* (North Lincolnshire Council, 2010)

- *Local Transport Plan – 2006 to 2011* (North Lincolnshire Council, 2006)

- *Strategic Flood Risk Assessment for North and North east Lincolnshire* (North Lincolnshire Council, 2010)

- *Draft North Lincolnshire Economic Development Strategy* (North Lincolnshire Council, 2009)

- *Climate Change Action Plan for North Lincolnshire* (North Lincolnshire Council, 2007).

4.5 PLANNING HISTORY OF THE SITE

4.5.1 The following planning applications have previously been applied for by Able in relation to lands within the proposed AMEP development site, with their decisions also shown.

Table 4.1 Historical Planning Applications

Planning App. No.	Description	Date application made	Decision
2007/0101	Tarmac the 22.11 hectare site for use for port-related external storage, to include the construction of 2 workshop buildings, a modular office building, a modular security office building, construction of a wash pad and wash bay and construction of associated staff and visitor car parking and install a 3 m high security fencing, lighting towers and a sewage treatment plant at Able UK Ltd., Rosper Road, North Killingholme.	12/02/2007	Granted
2008/0525	Construct an 860 m new tarmac site access road of width 7.3 m at Able Humber Ports Facility, Rosper Road, North Killingholme.	04/04/2008	Refused (New application submitted)
2008/0571	Remove condition 1 of planning permission 2004/1528 (use to be discontinued on or before 31/12/2008) to make permanent the existing temporary consented use for vehicle storage and distribution, erect a single-storey security cabin, workshop and office building, raise ground levels to 3.1-4.0 metres AOD and surface with tarmac, install 3.0 m high electrified security fencing with bird deflectors and erect 4, 30 m high lighting masts on land off Rosper Road, North Killingholme.	01/05/2008	Granted
2008/1375	Vary Condition 3 on application PA/2006/0039 dated 01/08/2007 (relating to low level shrubbery and hedging) to replace the words "Within ten months of the permission …" to "Prior to the commencement of operation …" at Able UK Ltd. Rosper Road, North Killingholme.	25/09/2008	Granted

Planning App. No.	Description	Date application made	Decision
2008/1401	Remove Condition 1 on PA/2004/1528 (use to be discontinued on or before 31 December 2008) and Condition 9 on PA/2002/1828 (site to have a permeable surface at all times) in connection with use of land for vehicle distribution and storage at Area B, Able Humber Port Facilities, Rosper Road, North Killingholme.	23/10/2008	Granted
2008/1428	Remove Condition 1 (no access and egress from Haven Road) and Condition 2 (the use shall be discontinued before 31 December 2008) on planning permission PA/2004/1601 at Able Ports Facilities, Rosper Road, North Killingholme.	24/10/2008	Granted

4.6 ADDITIONAL CONSENTS

4.6.1 The following are additional consents which it is proposed will either be applied for separately or disapplied under the terms of the DCO application to the IPC. However, consultation will be undertaken as part of the EIA process to ensure the appropriate discussions are held the statutory bodies responsible for issuing the various consents below.

Table 4.2 Planning Consents Sought, to be Applied For, or Disapplied

Item sought	Proposed Position
Permission from ABP to dredge and build in the Humber.	Disapplied on application
Environmental permit	To be applied for separately to the Environment Agency.
Licence under the Food and Environment Protection Act 1985 (or marine licence if Part 4 of Marine and Coastal Access Act 2009 is in force).	Deemed in application
Consent under the Coastal Protection Act 1949 (or marine licence if part 4 of marine and Coastal Access Act 2009 is in force).	Deemed in application
Pollution Prevention and Control permit	To be applied for separately to the local authority
Grid connection	To be applied for separately to National Grid
Hazardous substance consent	Deemed consent will be sought in the application
Approval of design and sitting of buildings	To be applied for separately to North Lincolnshire Council

Item sought	Proposed Position
Greenhouse gas emissions permit	To be applied for separately to the Environment Agency
Flood Defence Consent	To be applied for separately to the Environment Agency.

5 EIA METHODOLOGY

5.1 INTRODUCTION

5.1.1 This chapter of the Scoping Report describes the broad principles of the methodology that will be adopted in undertaking the EIA. In so doing, it describes the approach that will be used to identify, evaluate and mitigate environmental effects. It also sets out the proposed temporal, spatial and technical scope of the EIA. Further details on individual topics are given in *Chapter 6*.

5.2 BASIS OF THE ASSESSMENT

Overview

5.2.1 EIA is a procedure required under the terms of European Union Directives 85/337/EEC and 97/11/EC on assessment of the effects of certain public and private projects on the environment.

5.2.2 The primary objective of an EIA is inscribed under Article 2 of the Directive, which states that,

> "*Member States shall adopt all measures necessary to ensure that, before consent is given, projects likely to have significant effects on the environment by virtue, inter alia, of their nature, size or location are made subject to a requirement for development consent and an assessment with regard to their effects*."

5.2.3 Article 8 of the Directive also states that,

> "*The results of consultations and information gathered pursuant to [the EIA procedure] must be taken into consideration in the development consent procedure*".

5.2.4 In practical terms, the purpose of the ES is to inform the decision-maker (in this case, currently the IPC) and to provide a source of information for the public, regarding the likely significant environmental issues attached to the development during its construction, occupation and (where relevant) decommissioning.

5.2.5 The environmental effects of the proposed development will be predicted for each relevant environmental topic (water quality, commercial fisheries, traffic, socio-economics etc) by comparing baseline environmental conditions (ie the situation without the

proposed development) with the conditions that would prevail were the proposal to be constructed and operated.

5.2.6 Effects will be predicted in relation to environmental receptors, that is: people (eg residents of buildings, users of facilities, employees of businesses), built resources (eg listed buildings) and natural resources (eg a site of ecological importance).

5.2.7 In addition to the relevant Directives, and where relevant, the EIA will be undertaken with reference to the following documents, amongst others:

- *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2009*
- *Circular 2/99 Environmental Impact Assessment*, DETR, March 1999
- *Environmental Impact Assessment: A Guide to the Procedures*, DETR, 2000
- *Preparation of Environmental Statements for Planning Projects that Require Environmental Assessment – A Good Practice Guide*, DoE, 1995
- *Note on EIA for Local Planning Authorities*, IDPM, April 2004
- *Guidelines for Environmental Impact Assessment,* IEMA, 2004.

Assessment Process

5.2.8 Flexibility to respond to commercial opportunities and emerging economic circumstances is essential if the proposed development is to proceed and be successful. A degree of flexibility will, therefore, be built into the scheme design.

5.2.9 This does, however, introduce some complexity into the EIA process common to many large scale developments, which are dependent on market conditions for their delivery. The 2009 EIA Regulations require an ES to provide a description of the location, design and size of the scheme to enable the likely significant environmental effects to be assessed and to enable the IPC, statutory consultees and the public to make a properly informed response.

5.2.10 A balance has to be sought, therefore, between defining the proposals in enough detail to assess their impacts, while leaving enough flexibility to

enable the development to be successfully delivered under emerging market conditions.

5.2.11 It is anticipated that parts of the proposed development may be divided into "land parcels", with parameters set as to appropriate levels of development with respect to height, massing and density. These parameters will provide an "envelope" for assessing the impacts of the development.

5.2.12 It is intended that the parameters will ensure that all of the objectives for the proposed development can be delivered. The EIA will take account of all the reasonable variations in the form of the development that would be permissible under the parameters, and present the likely significant effects of these where appropriate.

5.2.13 If the actual development turns out to be different in any substantial way, or its impacts are materially worse than predicted then a further application would need to be submitted prior to construction or implementation of any divergent elements.

5.3 PREVIOUS WORK UNDERTAKEN

5.3.1 It is important to note that a certain amount of baseline data collection has already been undertaken, or is currently underway, in connection with the proposed development. This has been undertaken principally in connection with the following environmental issues:

- site investigation of superficial ground deposits;
- phase 1 habitat and ecological environment;
- great crested newt surveys;
- water vole surveys;
- coastal bird survey; and
- breeding bird surveys.

5.3.2 These and other studies will form part of the EIA work going forward and will be valuable in contributing towards an understanding of the existing environmental conditions in the area. More detail is given on these surveys in the relevant sections of *Chapter 6*.

5.4 DEFINING THE SIGNIFICANCE OF ENVIRONMENTAL EFFECTS

5.4.1 The 2009 EIA Regulations require an ES to report on those environmental effects arising from a project that are considered likely to be significant.

5.4.2 While there is no statutory definition of what constitutes a significant effect, it is clear that the primary purpose of reporting an assessment of any effect of a project is to inform the decision-maker so that it is properly informed when making its decision. In many cases, such as for noise, there are accepted methods for quantifying effects and determining the threshold of significance. In others, such as visual impact, the effects cannot be measured scientifically and only established practice or guidance offers an approach to assessing the significance of effects. In these cases it is necessary to define more qualitative criteria and thresholds.

5.4.3 On this basis, a significant effect has been defined for the purposes of this project, as an effect that, either in isolation or in combination with others, that should – in the opinion of the team carrying out the EIA – be taken into account in the decision-making process.

5.4.4 This definition requires a common framework within which to predict the significance of effects for all environmental topics arising from the scheme. Within this framework, a set of criteria for each environmental topic will be used in order to predict any significant effects arising from the scheme.

5.4.5 In identifying significant effects, the EIA will take into account their nature and duration, as follows:

- *Site-specific effects*. Effects that result from a geographically localised impact and which are significant primarily at a neighbourhood or district level.

- *Wider effects*. Effects that are individually significant at a regional level, but which are unlikely to be significant locally.

- *Positive effects*. Effects that have a beneficial influence on receptors and resources.

- *Negative effects*. Effects that have an adverse influence on receptors or resources.

- *Temporary effects*. Effects that persist for a limited period only, due for example to particular construction activities (eg noise from construction plant). Where possible, the likely duration of effects will be identified.

- *Permanent effects*. Effects, which result from an irreversible change to the baseline environment (eg land take) or which persist for the foreseeable future (eg noise from operation).

- *Direct effects*. Effects that arise from the impact of activities that form an integral part of the project (eg new infrastructure).

- *Indirect effects*. Effects that arise from the impact of activities not explicitly forming part of the project (eg increased road traffic at Park and Ride sites).

- *Secondary effects*. Effects that arise as a result of an initial effect of the scheme (eg reduced amenity of a community facility as a result of construction noise).

- *Cumulative effects*. Those which arise from the combination of different effects at a specific location, the recurrence of effects of the same type at different locations and the interaction of different effects over time.

5.4.6 In general terms, there are three stages required to enable the significance of impacts to be identified, as follows:

- Identification of the baseline conditions and the sensitivity and importance of receptors.

- Identification of the magnitude of change (impacts) upon each receptor.

- Identification of the impact significance, which is the product of a combination of the above two variables.

5.4.7 The process used to combine the sensitivity of a receptor with the magnitude of change, in order to evaluate an impact's significance, is shown as a matrix in the table below. It should, however, be noted that in some cases this process may be implicit rather than explicit.

Table 5.1 Matrix for the Evaluation of Significant Environmental Impacts

Magnitude of Change	Sensitivity of Receptor			
	High	**Moderate**	**Low**	**Negligible**
High	Significant	Significant	Significant/ Not Significant	Not Significant
Moderate	Significant	Significant	Significant/ Not Significant	Not Significant
Low	Significant	Significant/ Not Significant	Not Significant	Not Significant
None	Not Significant	Not Significant	Not Significant	Not Significant

5.5 MITIGATION OF ENVIRONMENTAL EFFECTS

5.5.1 Schedule 4 of the 2009 EIA Regulations requires that where significant effects are identified, "a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment" should be included in the ES.

5.5.2 The achievement of high environmental standards is integral to Able's proposed development. Measures to avoid, reduce and if necessary mitigate environmental impacts will be built into the scheme parameters.

5.5.3 For each significant adverse effect of the proposed development that is identified during the EIA, the specialists undertaking the assessments will identify mitigation measures consistent with statutory requirements and good practice in their respective field. These measures will be committed through a number of routes, for example by proposed conditions or through a Code of Construction Practice or equivalent.

5.5.4 Residual effects (assuming mitigation options are applied) will be classified as non-significant or still significant (albeit reduced), as appropriate. Where effects are still significant, the extent of any amelioration will be reported in the ES.

5.6 SCOPE OF THE ASSESSMENT

Technical Scope

5.6.1 The range of environmental topics to be addressed in the ES is generally referred to as the technical scope. As defined in Schedule 4 of the 2009 EIA Regulations, an ES is required to report on impact particularly in relation to "*population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors*".

5.6.2 Potential environmental issues have been evaluated as part of this scoping exercise in order to determine the extent to which they should be included in the EIA, having regard to whether they are likely to give rise to significant effects. As a result of this exercise the assessment of some impacts may be "scoped out" of the EIA. Those issues not scoped out will form the technical scope of the EIA.

5.6.3 The basis on which an effect may be included or scoped out of the EIA is explained further in *Chapter 6*. An assessment will be undertaken by specialists for each of the environmental topics that have not been scoped out of the EIA.

5.6.4 It should be emphasised that the scoping out of environmental issues is reversible. If, as the proposal develops, it becomes apparent that a specific effect may arise in relation to a matter previously scoped out, the environmental issue in question will be readmitted to the EIA, as appropriate.

Spatial Scope

5.6.5 The spatial, or geographical, scope of the assessment takes into account the following factors:

- the physical extent of the proposed works, as defined by the scheme design;
- the nature of the baseline environment and the manner in which the impacts are likely to be propagated; and
- the pattern of governmental administrative boundaries, which provide the planning and policy context for the project.

5.6.6 For example, any potential effects on archaeology would tend to be confined to those areas physically disturbed by the works, whilst the effects of noise or visual intrusion could potentially be experienced at some distance from the works.

5.6.7 In most cases the impact is likely to affect interests for a limited area around the scheme. For some issues (such as socio-economics) the impact may affect regional and county level interests, or even be an impact of national or international significance.

5.6.8 Appropriate study areas will be considered for each environmental topic by the specialist(s) undertaking that assessment, as explained further in *Chapter 6*.

Temporal Scope

Overview

5.6.9 The temporal scope of the assessment generally refers to the time periods over which impacts may be experienced. This will be established for each discipline, where appropriate through discussion with the relevant statutory consultees.

5.6.10 In general, the following terms will be used:

- *short-term* – the impact is temporary and lasts for up to 12 months
- *medium-term* – the impact occurs for up to 5 years
- *long-term* – the impact remains for a substantial time, perhaps permanently.

Construction Phase

5.6.11 Construction phase impacts may potentially arise during the whole of the construction works, which is expected to be from 2012 to 2014. This is based on an estimated construction period of 24 months.

5.6.12 Concurrent construction of each of the core components of the proposed development (for example the quay and the biomass facility) would represent the most concentrated construction activity, during which period construction disruption impacts would be expected to be greatest. The EIA will, therefore, assess this scenario.

5.6.13 The assessment will also recognise that if construction were not concurrent, construction impacts are likely to be less intense, but spread out over a longer period. This is particularly an issue for construction noise.

5.6.14 The assessment will also take into account the time of day during which works are likely to be undertaken, notably whether they are undertaken during daytime or night-time periods.

Operational Phase

5.6.15 For the operational phase, the temporal scope will be determined by the predicted date of the proposed development commencing operation, which is taken to be 2014. For certain environmental topics, where effects are dependent on longer term considerations, such as natural or planned restoration or flood risk, which can affect ecology and landscape, the operational phase will be taken to extend beyond the proposed development commencing operation for assessment purposes.

5.6.16 Similarly, the traffic assessment (and assessments related to traffic, principally CO_2 assessment, noise and air quality) will take account of development and transport growth into future years and where a gradual increase in an effect, such as noise from port traffic growth, occurs the temporal scope of the assessment will also extend beyond the date of opening of the works.

Decommissioning Phase

5.6.17 Decommissioning is particularly important for a development with a design life not to be exceeded, and which could affect the land on which it was built (such as a waste disposal site).

5.6.18 However, in the case of the proposed development, consent is not being sought for any contaminating industrial processes and none will be carried out, save for placing building foundations on the ground and laying out services, roads and parking and storage areas. The buildings themselves would have a design life of up to 60 years but would not result, when being demolished, in any abnormal environmental problems.

Cumulative Impacts

5.6.19 Other schemes in the vicinity of the proposed development which have been granted permission (whether in outline or full), or for which an

application for consent has been submitted but not determined, will be considered in combination with the AMEP proposal in the assessment of cumulative impacts in the EIA, where relevant information is available. The assessment of cumulative impacts is an integral part of the EIA process and ensures that all aspects of potential impacts from the proposed development have been addressed to ensure minimum impact on communities and the natural environment. Those schemes considered in the EIA may potentially include, but are not limited to, the following:

- Drax Power Station – application to construct and operate a 290 MW biomass fuelled electricity generating station
- ABP's Quay 2005
- Vireol plc 150,000 tonne per year Bioethanol plant
- URSA glass wool manufacturing plant
- Grimsby Ro-Ro Scheme
- the Highways Agency's proposed improvements to the A160
- Dong Energy's proposed biomass plant at Hull

5.6.20 These schemes will be considered, alongside other planned developments identified through consultation, as part of the EIA where impacts could overlap temporally or spatially and an application for consent has been submitted.

6 ENVIRONMENTAL TOPICS & POTENTIAL EFFECTS

6.1 INTRODUCTION

6.1.1 This chapter sets out the broad scope of each of the major "topic" assessments for the EIA. Descriptions are given, under each topic heading, of the baseline conditions and sensitivities, potential impacts during the construction and operational phases and the proposed EIA methodology to be applied in assessing impacts on each topic.

6.1.2 Based on an understanding of the design and location of the proposed development and the local and regional environmental issues that are likely to be relevant, ERM has identified and reviewed those issues that are likely to be material considerations, ie scoped into the EIA process.

6.2 HYDRODYNAMIC & SEDIMENTARY REGIME

Introduction

6.2.1 This section focuses on the issues associated with the hydrodynamic and sedimentary regime within the estuary and how they will potentially be affected by the proposed development.

Baseline Conditions and Sensitivities

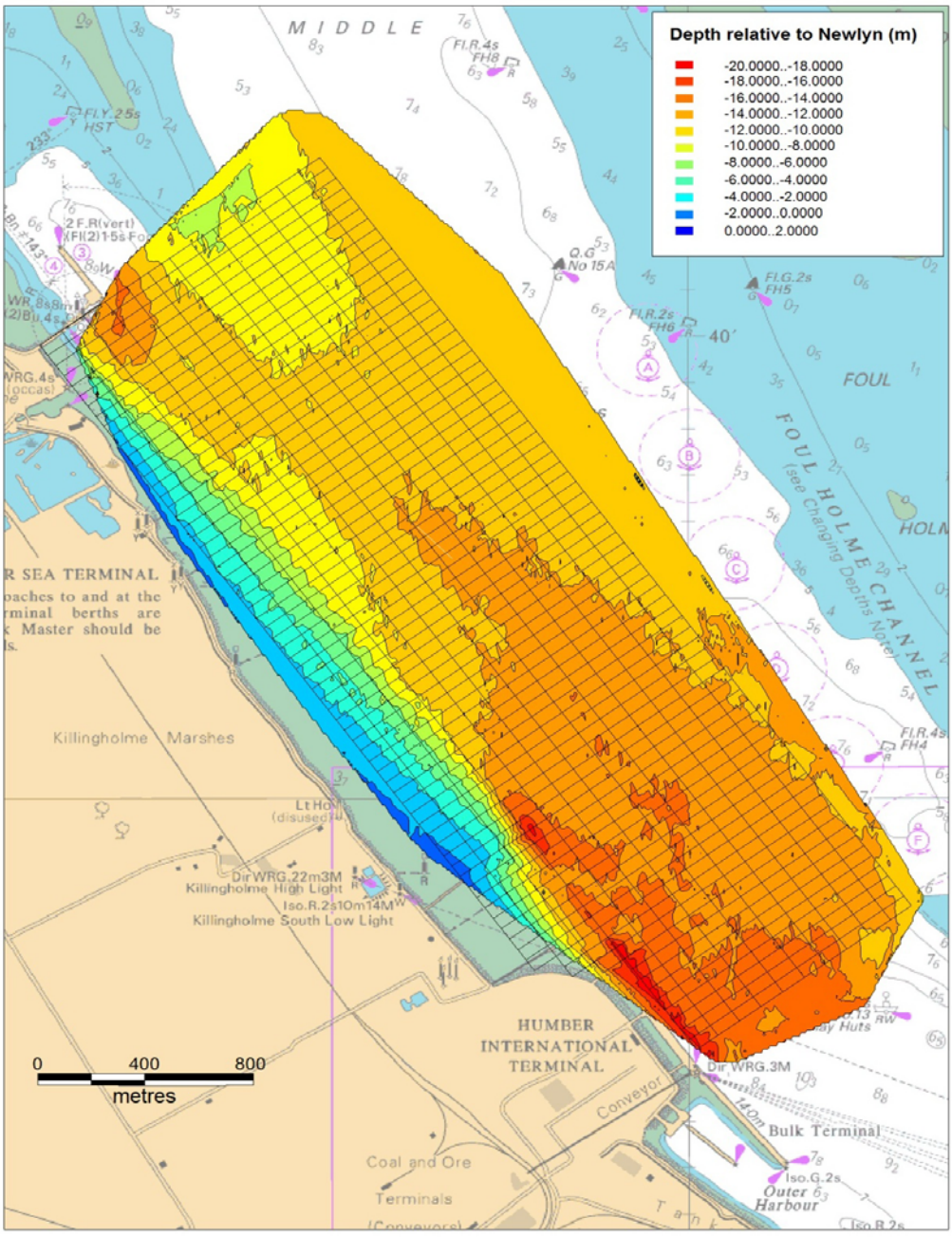
Overview

6.2.2 The hydrodynamic and sedimentary regime in the Humber estuary has been studied extensively over recent years in response to growing pressures on the estuary system (both natural and man-made). These include localised developments that require reclamation or dredging (for example port project or flood protection works) and the potential impacts of sea level rise resulting in a change in the area and distribution of protected habitat within the European protected sites and an increased risk of flooding.

6.2.3 Generally it is thought that the estuary has been slowly eroding in the outer and middle sections, whilst accretion occurs in the inner estuary (Environment Agency, 2000).

6.2.4 As shown in *Figure 6.1* there is a general trend of decreasing depth from the southern downstream end of the proposed project site at the Humber International Terminal to the northern upstream end at the Humber Sea Terminal. The deepest waters are adjacent to the berthing points of the Humber Sea Terminal, at the South Killingholme Oil Jetty and at the Humber International Terminal. This deep water facilitates the berthing of large vessels. These areas are regularly dredged to maintain these depths.

Figure 6.1 Humber Estuary Bathymetry



Source: IECS (2010) South Humber Channel Marine Studies: Bathymetry & Hydrography Survey Report

6.2.5 Apart from the berths the observed depths range from -8.1 to -12.1 m CD, with marginally deeper waters observed in the shipping channels and the approaches to the Humber Sea Terminal and an overall gradation to shallow waters towards the northern upstream section of the estuary.

6.2.6 A recent study (IECS, 2010) examined the water temperature and salinity at two separate locations within the estuary adjacent to the proposed project location. Adjacent to the shore of the estuary it has been shown that the water temperature follows a regular pattern displaying a gradual increase toward low water and falling again as the tide floods, with temperature ranging from approximately 12ºC to 16ºC. However, in addition to this general pattern, distinct peaks in temperatures reaching 18ºC have been observed at low water on most tidal cycles. It is, however, possible that these peaks in temperature are the result of nearby discharges from cooling water outfalls along the South Humber Bank.

6.2.7 Temperature fluctuations in deeper water are more stable, but do show the same general pattern of increasing temperature with the ebbing tide and falling temperature with the flooding tide. The temperature in the middle of the estuary ranges from approximately 11ºC to 15ºC.

6.2.8 Salinity readings close to the shore are erratic. There is a general trend of increasing salinity during the flooding tide and decreasing salinity on the ebbing tide. At low water there is a distinct peak in salinity which appears to coincide with the peak in temperature, with a corresponding trough in salinity at high water. These regularly occurring peaks and troughs coincide with slack water and as such would suggest the localised affect of a nearby outfall. For the majority of measurements, the salinity ranges from approximately 15 psu to 27 psu.

6.2.9 The tidal range within the Humber Estuary varies significantly. It ranges from 3 m during the neap tide to 6 m during the spring tide. The high water level on a spring tide at Goole is more than 1 m above the level at Spurn. Water levels can be up to 3 m above normal levels during extreme weather events.

6.2.10 For the average tide, the total volume of water between the mean high and the mean low tide is approximately 80 times the water discharged by the Humber River. This indicates that within the estuary the hydrodynamic regime is dominated by the tidal flow.

Sedimentary Regime

6.2.11 The Humber estuary is a major site for the accumulation of sediments and there are thought to be three important potential sources of sediment to the estuary:

- fluvial sediments from the catchment erosion;
- rapid coastal erosion of the Holderness coastline; and
- North Sea sediments.

6.2.12 About six millions tonnes (dry solid weight) of sediment enter the estuary each year, most of it either as background material from the North Sea or from erosion of the Holderness coast and only a small proportion (less than 3 percent) from the rivers.

6.2.13 Qualitative and quantitative contribution estimates for sediments in the estuary indicate that Humber estuary sand sized sediments are derived almost exclusively from marine sources. Source contribution estimates suggest 92 percent Holderness till and 8 percent fluvial for the 63-125 μm sediment fraction and 98 percent Holderness till and 2 percent fluvial for the 125-250 μm sediment fraction (Cox, 1999).

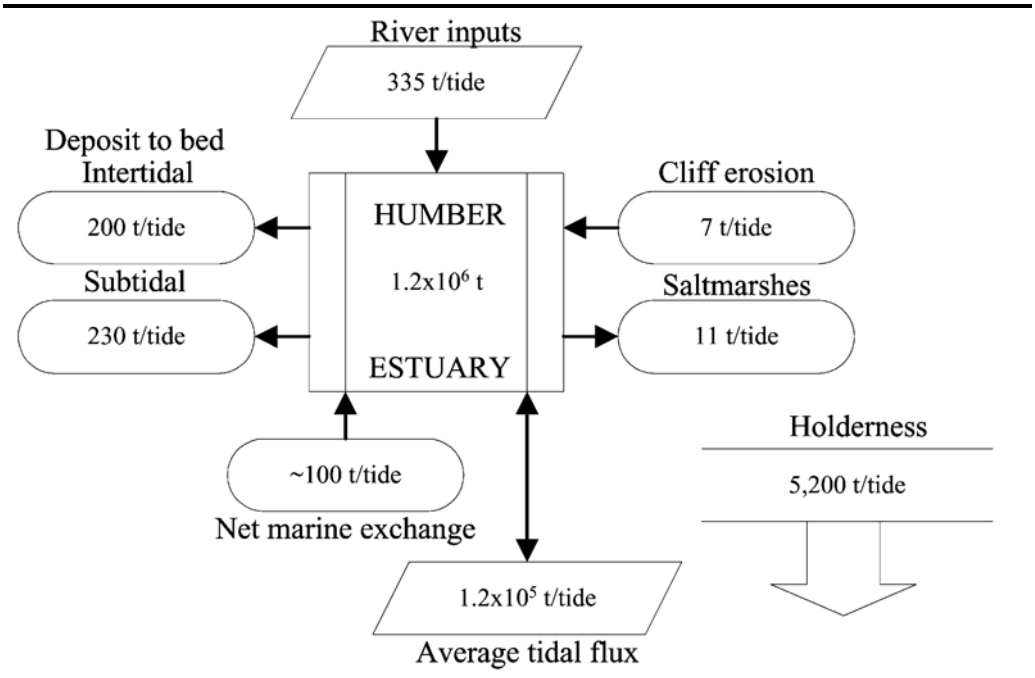
6.2.14 It is estimated that up to 1.26 million tonnes of sediment may be in the water column on any given tide with 85 x 10^6 t/year of sediment exchange across the mouth (SedNet, 2006). There is, however, a large degree of variability in the suspended sediment concentration throughout the estuary. The position of the turbidity maximum varies depending on the balance of freshwater/tidal water flows and the availability of sediment and is governed by the hydrodynamic sediment transport processes, including tidal asymmetry and salinity-induced gravitational circulation.

6.2.15 The exchange of material is important in understanding the impact on the sedimentary regime (*Figure 6.2*). Essentially material is exchanged at two levels, through flux at the mouth of the river and through exchanges in the estuary.

6.2.16 Within the estuary the exchanges consist of: maintained suspended sediment load; deposition to the bed and the export of material through dredging. While most of the marine sediment material returns to the North Sea on the ebb tide, some remains in the estuary, moving upstream along the shoreline and either accumulating there or entering the channels and being carried back towards the sea. Each year approximately three millions tonnes of sediment are dredged from the docks, port approaches and the main shipping channel. All of the

material dredged from the estuary is deposited within the estuary, closed to the source areas. Dredging is also conducted in offshore areas and may also affect the sediment regime within the estuary.

Figure 6.2 Net Sediment Budget for Humber Estuary



Source: (Townend & Whitehead, 2003)

6.2.17 Typically, the Humber estuary bed sediment types consist of sand/muddy sand within both the intertidal and the subtidal zones. The mud areas are predominantly located within low energy environments, near Burcom Sand and the intertidal areas at Read's Island and Whitton Sand upstream of the Humber Bridge. Coarser materials, including gravels, are found in the higher energy environments nearer the mouth of the estuary.

6.2.18 Overall, the estuary system is believed to be a net importer of sediment material and its dynamic equilibrium is influenced by both fluvial and marine sources. Typically, the estuary system imports finer sediments over the intertidal sandbanks and exports coarser material via the ebb tide channels.

6.2.19 A range of baseline information will be collated for the EIA in order to obtain a comprehensive picture of the hydrodynamic and sediment regime and to assess the sensitivity of these aspects of the physical environment in the estuary. In summary the baseline condition and sensitivities will be further informed by collating further survey and desktop data, on:

- Estuary bathymetry;
- Current and tide velocities and water levels; and
- Bed load sediment characteristics and suspended sediment loads.

6.2.20 It is considered important that key stakeholders are consulted to provide further information on the baseline conditions. Consequently additional engagement during the EIA process is envisaged with, amongst others, the Port Authority (Associated British Ports) and the Environment Agency. This consultation will continue through the impact assessment stage of the EIA.

Potential Impacts

Overview

6.2.21 The proposed development has the potential to impact on the hydrodynamic and sedimentary regimes in the Humber estuary. This potential impact arises principally due to the construction of the new quay within the intertidal and subtidal environment. However, there is also the potential of impacts arising due to the installation of a new cooling water intake/outfall pipeline as part of the biomass development. The potential impacts identified during scoping are summarised below for both the construction and operational phases of the development.

Construction

6.2.22 There will be a potential for impacts on the hydrodynamic and sedimentary regimes due to the construction of the new quay and the associated infrastructure within the estuary. Potential short-term impacts on the estuary regime associated with construction include:

- the removal of intertidal and subtidal sediments from the project location and relocation to dredging disposal sites, which may influence the sedimentary regime in the estuary;

- suspended sediment plumes during capital dredging / pile installation, in-fill of quay structure and cooling water intake / out-fall construction; and

- suspended sediment plumes associated with disposal of capital dredge arisings.

Operation

6.2.23 The longer term presence and operation of the proposed development has the potential to impact on the hydrodynamic and sedimentary regimes as a result of:

- alteration of the hydrodynamic and sedimentary regimes due to the altered morphology of the coastline once the new quay is constructed;
- impacts on wider estuary morphology and existing navigational channels as a result of altered hydrodynamic and sedimentation patterns;
- sediment plumes and alteration of the sediment regime associated with ongoing maintenance dredging requirements; and
- possible alteration of temperature differential in the location of the cooling water outfall pipeline.

6.2.24 The longer term physical presence of the new quay has the potential to cause significant changes to the hydrodynamic and sedimentary processes that currently exist in the middle part of the estuary. Changes to the hydrodynamic process could influence sedimentation patterns in the area and result in a secondary impact on intertidal habitats such as mudflats or saltmarshes, either causing erosion of intertidal areas or increased rates of accretion which, whilst sometimes beneficial in creating new mudflats, can also cause smothering of saltmarsh habitats. In addition to the potential impacts on the intertidal habitats, consideration will need to be given to the potential effects on the estuary as a whole and the potential that the proposed development could exacerbate the effects of sea level rise on the estuary.

6.2.25 This is also relevant in the context of nature conservation designations as intertidal mud, saltmarsh and sandflats are included in the Humber Estuary's Ramsar and SCI (SAC) designations. In addition to direct loss of habitats associated with the construction of the new quay, a significant change in the hydrodynamic or sedimentary regime may cause additional loss or change to these habitats and may be deemed a significant impact on designated habitats within the estuary.

6.2.26 The hydrodynamic and sedimentary regime may also be affected by the cooling water intake and outfall required for the biomass plant. The intake head is likely to be located close to the estuary bed, while the outfall will be located at or near the surface to ensure that the cooler

intake water can be separated from the warmer plume surface water. Hence, there is the potential that due to a temperature differential between the discharge and the receiving waters the settling rates of suspended sediment in the water column could be affected.

Proposed Assessment Methodology

6.2.27 The overall approach to this topic in the EIA will be to assess the impacts of the proposed project on the hydrodynamic and sedimentary regime through the use of computer modelling analysis.

6.2.28 In terms of assessing the potential impacts on the hydrodynamic and sediment regime, a two dimensional (2D) computer model will be developed and utilised to assess the impacts of the project during both the construction and operational phases. The 2D modelling will be used to examine issues including, but not limited to:

- changes to the morphology and tidal prism of the estuary;
- changes to the water levels;
- changes to tidal currents and bed shear stress;
- changes to suspended sediment concentrations;
- changes to sediment patterns and erosion and accretion rates from the quay construction and dredging;
- changes to maintenance dredging commitments in the estuary; and
- the impact of material disturbed during the dredge.

6.2.29 For the impacts on the hydrodynamic and sedimentary regime during the construction phase of the project it is envisaged that the sediment transport module of the modelling will be used to assess the potential distribution of sediment disturbed or released (ie sediment plumes) during construction activities such as dredging, vessel movements and piling.

6.2.30 The operational phase assessment will be assessed by using the modelling to illustrate how the long term physical presence of the quay and cooling water pipeline may alter the hydrodynamic regime in the area (ie tides, currents and water levels) and what secondary impact this may have on sediment movement patterns and associated rates of erosion and accretion in the estuary.

6.2.31 The EIA will present the results of the computer modelling assessment and interpret these results with regard to the predicted extent of impact on the hydrodynamic and sedimentary regime both around the proposed development location, and if relevant within the wider estuary. Any secondary impacts, such as loss of intertidal habitat due to changes in erosion rates will also be clearly identified and assessed in the EIA.

6.2.32 It will be important that relevant stakeholders are also consulted as part of the EIA process to determine their opinions on the approach towards assessing the impacts in terms of the hydrodynamic and sedimentary regimes and, the subsequent results of that assessment. Several stakeholders have, as part of Able's informal consultation process, already highlighted issues associated with changes to the hydrodynamic and sedimentary regime as key concerns. Those bodies that will be specifically consulted on these issues will include, but not be limited to:

- Humber Estuary Coastal Authorities Group;
- Environment Agency;
- Associated British ports (ABP);
- North Lincolnshire Council; and
- Natural England.

6.3 WATER QUALITY

Introduction

6.3.1 This section addresses the issue of water quality and details the approach to assessing the potential impacts of the proposed development on water quality.

Baseline Conditions and Sensitivities

6.3.2 The water quality within the Humber estuary has improved significantly over recent decades, in part due to the introduction of new laws and regulations as well as the introduction of two stage sewage treatment facilities and improvements in the quality of the component rivers themselves (Humber Management Scheme, 2004). To date the main sources of contaminants have been largely from effluent discharged directly into the estuary. However, the historical development of various industries around the estuary has also led to some pollution by oil and chemicals.

6.3.3 A preliminary assessment of baseline conditions in terms of water quality has been carried out based on a range of information from the Environment Agency (EA) website and additional desktop sources.

6.3.4 The Environment Agency are responsible for monitoring the water quality in the Humber and manage a comprehensive programme of both chemical and biological testing and monitor compliance with all permits for consents, authorisations and licences issued for discharges. The monitoring and management of the water quality is based on the requirements of various EU Directives and associated UK legislation.

6.3.5 The water quality classifications for rivers, lakes, estuaries, coastal waters and groundwaters throughout England and Wales are rated in accordance with the Water Framework Directive. The overarching approach of the Water Framework Directive applies across all EU Member States and sets out a multi-targeted methodology for the assessment of water qualities. In addition to assessing the standards of water bodies it also establishes environmental objectives for entire aquatic systems; river basin management plans examine the chemical and biological quality of water body. The ecological status of a water body is based on the biology, chemistry (physico-chemical and specific pollutants), hydrology and morphology of a water body.

6.3.6 Within the vicinity of the proposed development there are several surface water features which have been assessed under the Water Framework Directive and their results, in terms of ecological and chemical quality, are presented in *Table 6.1*.

Table 6.1 Surface Water Features Ecological and Chemical Quality

Topic	Skitter Bk/E Halton Bk from Ulceby Skitter to Humber Estuary	North Killingholme main drain	Habrough Marsh drain
Waterbody ID	GB104029067650	GB104029067580	GB104029067570
Management Catchment	Louth Grimsby and Ancholme	Louth Grimsby and Ancholme	Louth Grimsby and Ancholme
River basin District	Humber	Humber	Humber
Typology Description	Low, Small, Calcareous	Low, Extra Small, Calcareous	Low, Small, Calcareous
Hydromorphological Status	Heavily Modified Water Body (HMWB)	Artificial (A)	Not Designated A/HMWB
Current Ecological Quality	Poor Potential	Moderate Potential	Moderate Status
Current Chemical Quality	Does Not Require Assessment	Good	Does Not Require Assessment
2015 Predicted Ecological Quality	Poor Potential	Moderate Potential	Moderate Status
2015 Predicted Chemical Quality	Does Not Require Assessment	Good	Does Not Require Assessment

Topic	Skitter Bk/E Halton Bk from Ulceby Skitter to Humber Estuary	North Killingholme main drain	Habrough Marsh drain
Overall Risk	At Risk	At Risk	At Risk
Protected Area	Yes	Yes	Yes
Number of Measures Listed (waterbody level only)	1	0	0
Overall Biological Quality	Poor	-	-
Fish	Poor	-	-
Macro-invertebrates	Moderate	-	-
Overall Physico Chemical Quality	Moderate	Moderate	-
Ammonia	Good	Bad	-
Dissolved Oxygen	High	Good	-
pH	High	High	-
Phosphate	Moderate	-	-
Overall Hydro Morphological Quality	Not High	Not High	Not High
Hydrology	Moderate	Not High	Not High
Morphology	-	-	Good
Overall Specific Pollutants Quality	Good	Moderate	-
Ammonia	Good	Bad	-
Arsenic	-	High	-
Copper	-	High	-
Iron	-	High	-
Zinc	-	High	-

Source: Environment Agency's online environmental data mapviewer http://www.environment-agency.gov.uk/homeandleisure/37793.aspx

6.3.7 The Humber estuary itself is also assessed and rated under the Water Framework Directive. Its assessments and ratings are indicated in *Table 6.2*.

Table 6.2 Estuary Ecological and Chemical Quality

Topic	Humber Lower
Water Body ID	GB530402609201
River basin District	Humber
Typology	Mixed, macro, extensive intertidal
Hydromorphological Status	Heavily Modified
Current Ecological Quality	Moderate Potential
Current Chemical Quality	Fail
2015 Predicted Ecological Quality	Moderate Potential
2015 Predicted Chemical Quality	Fail
Overall Risk	At Risk
Protect Area	Yes
Number of Measures Listed (waterbody level only)	11
Overall Biological Quality	Moderate
Benthic Invertebrates	Moderate
Overall Physico Chemical Quality	Moderate
Dissolved Oxygen	High

Topic	Humber Lower
Nitrogen	Moderate
Overall Specific Pollutants Quality	Moderate
2-4-dichlorophenol	High
2-4-dichlorophenoxyacetic acid	High
Arsenic	High
Copper	High
Cyanide	High
Dimenthoate	High
Iron	High
Linuron	High
Mecoprop	High
Permethrin	High
Toulene	High
Zinc	Moderate

Source: Environment Agency's online environmental data mapviewer http://www.environment-agency.gov.uk/homeandleisure/37793.aspx

6.3.8 Within the Humber River Basin District, diffuse pollution pressures and morphological pressures are the main cause of the water bodies being at risk of not achieving potential status under the Water Framework Directive. Surface water bodies, including those identified in *Table 6.1* are classed as being at risk from these pressures including point and diffuse source pollution, water abstraction and flow regulation, morphological alteration and alien species.

Potential Impacts

6.3.9 The EIA will assess in detail the impact of the construction works associated with development of the project and the operation of the proposed development on the water quality of the Humber estuary. It is possible that the water quality in the locality of the development will be affected by both the construction and the operation of the proposed development.

Construction

6.3.10 The potential impacts on water quality associated with the construction of the proposed development that will be assessed in the EIA include the following:

- During the construction phase of the proposed development, and specifically the new quay, there is the potential for sediment disturbance and the release of contaminants. This disturbance could result in a higher suspended sediment load and the release of contaminants from the estuarine sediment which may affect ecological receptors. These contaminants could cause a range of problems, depending on their nature. They could settle/bind in the

estuary sediment and potentially be released at a later time in a more biologically active soluble form, or be dispersed in the water and affect receptors downstream.

- There is the potential for accidental spillages during the construction phase which may lead to a deterioration in the water quality. These spillages are likely to happen during the transport of material to or from storage areas on-site, as a result of inappropriate storage facilities, as a result of the construction activities in the estuary or due to poorly managed construction practices.

- Increased traffic on-site and in the Humber estuary, the movement of construction machinery and excavation activities, temporary stockpiling of material and wheel washing could all lead to the deterioration of water quality due to higher fine sediment delivery.

- Contaminated land could also impact on the water quality and the run-off of pollutants into the receptor water bodies would result in negative impacts on sensitive ecological receptors. The discharge of any contaminated waters would negatively impact on the water quality if the estuary. Permission to discharge contaminated waters must be sought from the Environment Agency in advance of the construction being undertaken if required; and

- The accumulation of litter due to increased activity on site could also negatively affect the water quality.

Operation

6.3.11 It is anticipated that there will be various impacts on the water quality due to the operation of the proposed development, including, but not limited to, the following:

- Permitted discharges of cooling water from the biomass power station could result in a deterioration of the water quality, as would discharges from the boiler water system and the flushing water system. There is expected to be a potential temperature uplift of up to 8ºC due to the cooling water discharge. The cooling water will also be treated with chlorine based disinfectant. Contaminants in the cooling water waste stream at concentrations greater than the background levels in the Humber estuary will be examined as part of the modelling to be conducted for the EIA.

- During the operational phase there will be the potential for spillages and leakages which may release contaminants into the surface

waters. These spillages and leakages could occur during the transport of material or as a result of the wind turbine assembly process.

- An increase in the area of hard standing will result in an increase in run-off and drainage, potentially higher sedimentation rates and a higher suspended solids load in the receptor water bodies.

Proposed Assessment Methodology

6.3.12 The proposed methodology and criteria that will be used in the EIA to assess impacts on water quality can be summarised as set out below:

- review of available information and applicable legislation pertaining to the water environment and the proposed development, including details and characteristics of the main features and their catchments, in terms of quality and use;

- defining a study area for the baseline water environment, describing existing conditions within that area and gaining an understanding of the importance, sensitivity and value of the various water environment features in the Study Area;

- identifying and assessing the potential temporary impacts and their magnitude relating to the construction of the scheme and temporary cumulative impacts associated with any existing or planned developments in the area (taking into consideration mitigation measures that are an integral part of the scheme);

- identifying and assessing the potential permanent and long term impacts and their magnitude relating to the construction and operation of the scheme and permanent cumulative impacts associated with any existing or planned developments in the area (taking into consideration mitigation measures that are an integral part of the scheme);

- developing measures to avoid, mitigate or compensate for identified impacts and to maximise any opportunities for environmental enhancement; and

- evaluating and reporting the significance of residual impacts to the water environment assuming the implementation of the mitigation measures developed for the scheme.

6.3.13 The assessment will also take account of existing and potential water uses and users, dependent species, habitats and receptors within, and associated with, the catchments that may be influenced by the proposals.

6.3.14 Where appropriate, the assessment will consider the sensitivities of, and effects upon, surrounding and dependent environments, including the effects upon flood plains, storm water storage areas and related developments and environments, initiatives (eg existing initiatives to improve water quality) and users of the water environment (eg abstractors, fisheries and recreational users).

6.4 ECOLOGY & NATURE CONSERVATION

Introduction

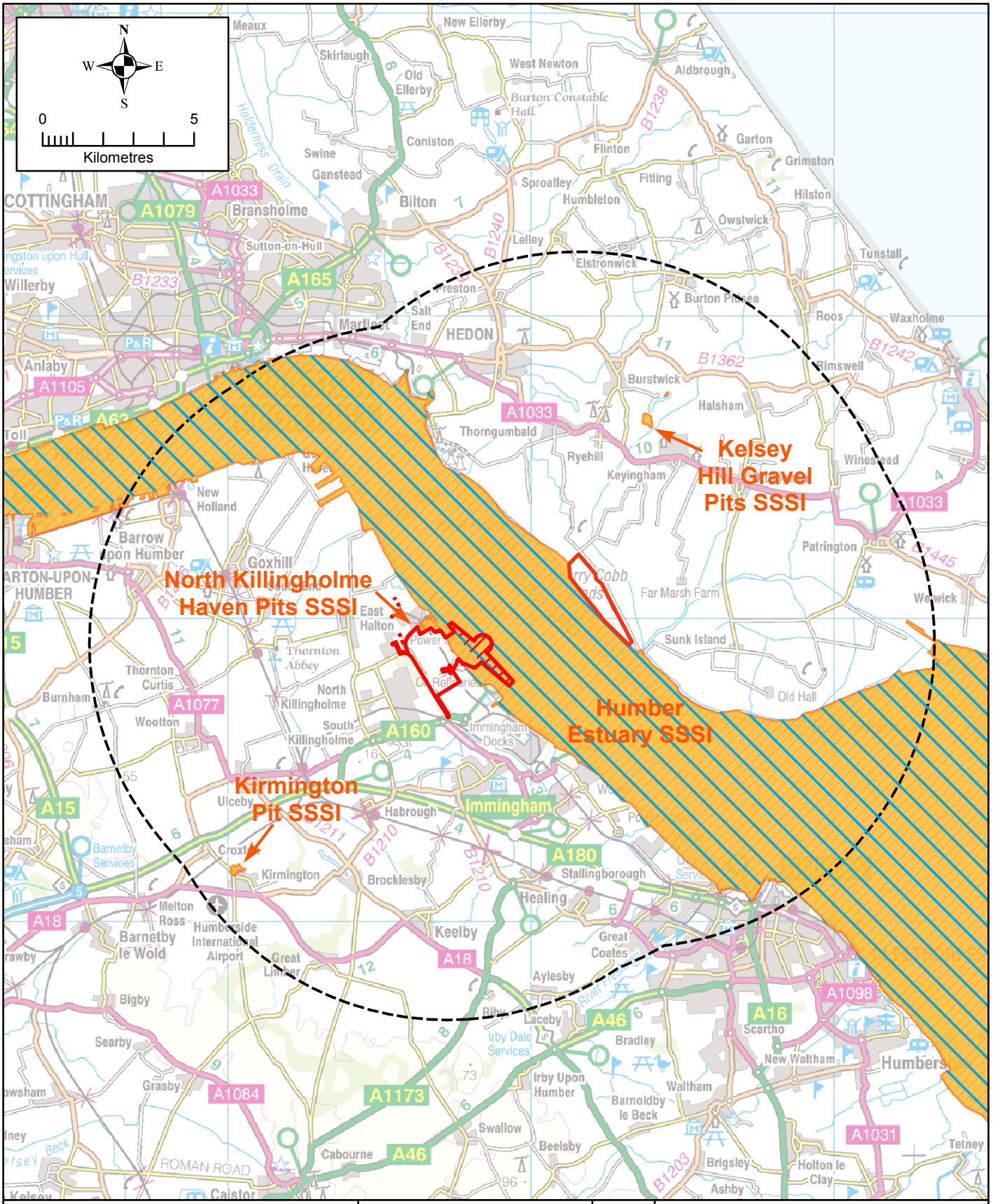
6.4.1 This section addresses the issues of ecology and nature conservation and details the approach to assessing the potential impacts of the proposed development in the EIA.

Baseline Conditions and Sensitivities

Designated Sites

6.4.2 The Humber estuary is approximately 24,470 ha in area and encompasses a variety of habitats, including intertidal and subtidal muds and sands and salt marshes and reed beds, supporting a wide range of rare and threatened species of plants, fish, invertebrates and mammals.

6.4.3 The site of the proposed development beyond the high water mark, ie the new quay, lies within the Humber Estuary SSSI, Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site and is adjacent to the North Killingholme Haven Pits SSSI. These designated sites are depicted in *Figure 6.3*; and the reasons behind their designation are outlined in *Table 6.3*.



KEY:

- Proposed Development Boundary
- Area of Dredging
- Route of Diverted Footpath
- 10 km Buffer
- Humber Estuary SAC, SPA and Ramsar Site
- Site of Special Scientific Interest

CLIENT: Able UK Ltd.

SIZE: A4

TITLE: Figure 6.3 Designated Sites

ERM
Eaton House
Wallbrook Court
North Hinksey Lane
Oxford, OX2 0QS
Tel: 01865 384800
Fax: 01865 204982

DATE: 16/09/2010 | CHECKED: WB | PROJECT: 0119511

DRAWN: IG | APPROVED: SP | SCALE: 1:175,000

PROJECTION: British National Grid

DRAWING: Designations.mxd

REV: 0

File: 0119511Able_CH_WB\MAPS\Designations.mxd

6.4.4 The legislative backgrounds to the designations within the vicinity of the proposed development are as follows:

- Special Areas of Conservation (SACs) are designated in accordance with *Council Directive 92/43/EEC* on the conservation of natural habitats and of wild flora and fauna ("the Habitats Directive"). The Habitats Directive establishes a network of important high quality conservation sites across the Member States of the EU, based on the conservation of 189 individual habitats and 788 separate species identified in Annexes I and II of the Directive as amended.

- Special Protection Areas (SPAs) are designated in accordance with *Council Directive 79/409/EEC* on the conservation of wild birds ("the Birds Directive"). The Birds Directive establishes a framework for the conservation and management of, and human interactions with wild birds throughout the Member States of the European Union, based on the species identified in Annex I of the Directive.

- Ramsar sites are wetlands of international importance, designated under the Ramsar Convention, 1971. Sites proposed for selection are advised by the UK statutory nature conservation agencies, or the relevant administration in the case of Overseas Territories and Crown Dependencies, co-ordinated through JNCC.

- Sites of Special Scientific Interest (SSSI) is a conservation designation for protected areas throughout the UK. An SSSI may be designated on any area of land which is considered to be of special interest by virtue of its flora, fauna, geological or physiographical features.

Table 6.3 Reasons for the Designation of Sites in the vicinity of the Proposed Development

Site Name	Reasons for Designation
North Killingholme Haven Pits SSSI	This SSSI comprises a complex of four flooded clay pits with associated rough grassland and scrub. It attracts a variety of waders and wildfowl and is important for its saline lagoon habitat, which supports several rare invertebrate species. It provides suitable habitat for diving ducks, such as pochard, tufted duck and, occasionally, scaupm, breeding species including little grebe, and reed, sedge, willow and grasshopper warblers. Spotted redshank, dunlin, greenshank, common sandpiper, little ringed plover, ruff and black-tailed godwit, the latter often in large numbers, are regular visitors. Rare species observed include spoonbill, avocet, little egret, little and Temminck's stints, red-necked phalarope, and curlew, pectoral, Baird's and white-rumped sandpipers.
Humber Estuary SSSI	The Humber Estuary is a nationally important site and includes a series of nationally important habitats such as the estuary itself and the associated saline lagoons, sand dunes and standing waters. The site is of national importance for the geological interest at South Ferriby Cliff and for the coastal geomorphology of Spurn. The estuary supports nationally important numbers of 22 wintering waterfowl and nine passage waders, and a nationally important assemblage of breeding birds of lowland open waters and their margins. It is also nationally important for a breeding colony of grey seals *Halichoerus grypus*, river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus*, a vascular plant assemblage and an invertebrate assemblage.
Humber Estuary SAC	This SAC was primarily designated due the presence of two habitats listed in Annex I, namely estuaries; and mudflats and sandflats not covered at low tide. These habitat types are located in the area where the new quay is to be constructed. The Humber Estuary also includes other habitats which are listed as Annex I Habitats, including: • sandbanks which are slightly covered by seawater all the time; • coastal lagoons; • *Saliconia* and other annuals colonising mud and sand; • Atlantic sea meadows (*Glauco-Puccinallietalia maritimae*); • embryonic shifting dunes; • shifting dunes along the shoreline with *Ammophilia arenaria* ('white dunes'); • fixed dunes with herbaceous vegetation ('grey dunes'); and • dunes with *Hippophae rhamnoides*. Grey seals *Halichoerus grypus*, river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* are Annex II species present in the Humber Estuary and are a qualifying feature, but again not a primary reason for the site selection.

Site Name	Reasons for Designation
Humber Estuary SPA	The outline of the Humber Estuary SPA coincides approximately with the Humber Estuary SAC. The Humber Estuary qualifies as a SPA under Article 4.1 of the Birds Directive due to it supporting the following Annex I species of European importance: **During the breeding season;** during the breeding season the area regularly supports: • *Botaurus stellaris* (Europe - breeding): 10.5% of the population in Great Britain. 2000-2002. • *Circus aeruginosus*: 6.3% of the population in Great Britain. 1998-2002. • *Recurvirostra avosetta* (Western Europe/Western Mediterranean - breeding): 8.6% of the population in Great Britain. 1998-2002. • *Sterna albifrons* (Eastern Atlantic - breeding): 2.1% of the population in Great Britain. 1998-2002. **Over winter;** over winter the area regularly supports: • *Botaurus stellaris* (Europe - breeding): 4% of the population in Great Britain. 1998/9 to 2002/3. • *Circus cyaneus:* 1.1% of the population in Great Britain. 1997/8 to 2001/2. • *Limosa lapponica* (Western Palearctic - wintering): 4.4% of the population in Great Britain. 1996/7 to 2000/1. • *Pluvialis apricaria* (North-western Europe - breeding): 12.3% of the population in Great Britain. 1996/7 to 2000/1. • *Recurvirostra avosetta* (Western Europe/Western Mediterranean - breeding): 1.7% of the population in Great Britain. 1996/7 to 2000/1 **On passage;** on passage the area regularly supports: • *Philomachus pugnax* (Western Africa - wintering): 1.4% of the population in Great Britain. 1996-2000.

Site Name	Reasons for Designation
Humber Estuary Ramsar Site	The Humber Estuary is designated a Ramsar Site due to it meeting the following criteria: • Ramsar criterion 1: The site is a representative example of a near-natural estuary with various component habitats including dune systems and humid dune slacks, estuarine waters, interitidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons; • Ramsar criterion 3: The Humber Estuary Ramsar site supports a breeding colony of grey seals *Halichoerus grypus* at Donna Nook. It is the second largest grey seal colony in England and the furthest south regular breeding site on the east coast. The dune slacks at Saltfleetby-Theddlethorpe on the southern extremity of the Ramsar site are the most north-easterly breeding site in Great Britain of the natterjack toad *Bufo calamita*; • Ramsar criterion 5: Assemblages of international importance (153,934 waterfowl, non-breeding season, five year peak mean 1996/97 - 2000/01); • Ramsar criterion 6: species / populations occurring at levels of international importance including Eurasian golden plover (*Pluvialis apricaria*), Red knot (*Calidris canutus*), Dunlin (*Calidris alpine*), Black-tailed godwit (*Limosa limosa*), Common redshank (*Tringa tetanus*), Common shelduck (*Tadorna tadorna*), Eurasian golden plover (*Pluuvialis apricaria*), Red knot (*Calidris canutus*), Dunlin (*Calidris alpina*), Black-tailed godwit (*Limosa limosa*), Bar-tailed godwit (*Limosa lapponica lapponica*), Common redshank (*Tringa totanus*); and • Ramsar criterion 8: the Humber Estuary acts as an important migration route for both river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* between coastal waters and their spawning areas.

6.4.5 The Humber Flats, Marshes and Coast Important Bird Area (IBA) is a non-statutory designation as identified and monitored by Birdlife International and covers the Humber Estuary and coastline to the north and south of the Humber. It includes an elongated single-spit capped by sand-dunes (Spurn Point), extensive intertidal habitats (especially Mudflats), saline lagoons and reedbeds (*Phragmites*). This area includes two sites that were previously treated as two separate IBAs, the "Humber Flats, Marshes and Coast" and the "Tetney Marshes". The Humber Flats, Marshes and Coast IBA is designated as an IBA by Birdlife International due to its international importance for supporting a significant number of threatened bird species, its exceptional numbers of migratory species and because the site supports many bird species with restricted ranges.

6.4.6 In order to inform the understanding of the habitats and species in and around the proposed project site, a number of ecology studies will be undertaken or are currently underway to inform the EIA, including:

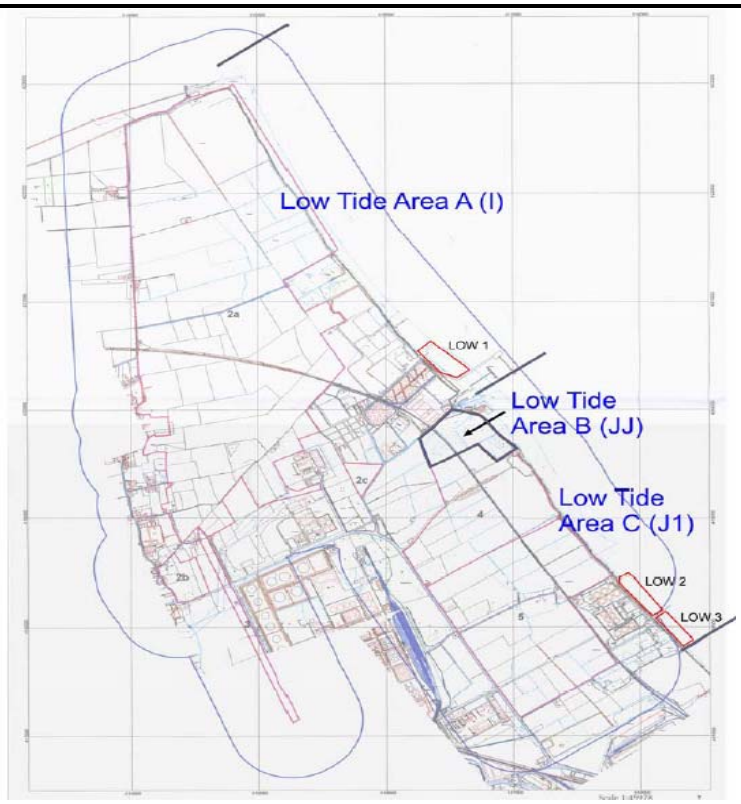
- an Extended Phase 1 habitat survey of the marine and terrestrial environment indicating the location of features of interest such as potential signs of protected species was undertaken and reported on in 2006;
- another Phase 1 habitat Survey, which was undertaken in 2010;.
- 12 months of coastal bird surveys (including monthly winter tide counts) and monitoring of flight lines throughout the year through vantage point surveys to quantify the numbers of birds that could potentially be at risk of collision with operational wind turbines;

6.4.7 The coastal bird surveys carried out monthly from May 2006 until February 2007 reported on bird numbers and location at both low and high tide. The survey was undertaken along the littoral edge of an 800 ha study site at Killingholme on the Humber Estuary. Standard WeBS recording methods were used with visits. Counts were carried out during the two hours either side of low water on Spring tides. *Figure 6.4* and *Figure 6.5* show the Low and High Tide survey sectors.

6.4.8 Desk based studies of existing bird populations and distribution will also be undertaken in order to produce a robust baseline against which to assess potential impacts to the designated sites which may be affected. Both the ecological and ornithological surveys will be carried out in accordance with recognised best practice guidance. The surveying work will also assist in the identification of suitable land for any compensatory measures that may be implemented for impacts to the Humber Estuary SPA and SAC.

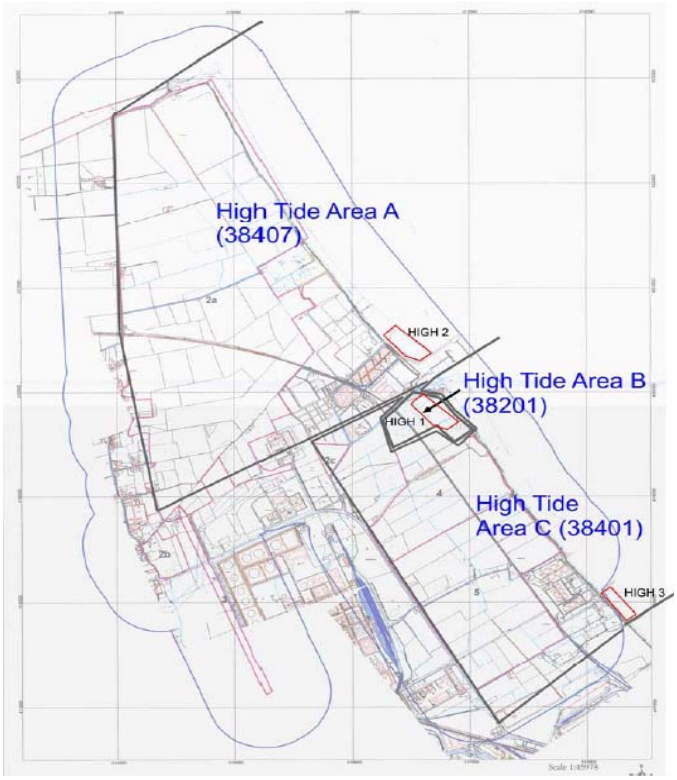
6.4.9 The Phase 1 habitat survey of the study area and 500 m buffer (*Figure 6.6*) carried out in 2006, was conducted using the techniques described by the JNCC (2003, 2004). The standard outputs from the Phase 1 survey include a habitat map and accompanying target-notes that highlight features of ecological interest. The survey was updated for the proposed application site in 2010.

Figure 6.4 Low Tide Survey



Note: Areas marked Low 1, Low 2 and Low 3 are 'hot spot' areas for waterbirds feeding at low tide.
Source: Coastal Birds Survey – Main Report, Just Ecology, 2007

Figure 6.5 High Tide Survey



Note: Areas marked High 1, High 2 and High 3 are 'hot spot' areas for waterbirds feeding at high tide.
Source: Coastal Birds Survey – Main Report, Just Ecology, 2007

Figure 6.6 Habitat Survey Study Area

Source: Extended Phase 1 and Scoping Study, Just Ecology, 2006

6.4.10 The Phase 1 survey included observations of any evidence for the presence of protected species and an assessment of the potential of the habitats present to support protected species, including mammals, birds, amphibians and reptiles.

6.4.11 Overall the EIA will consider in further detail the following within the baseline assessment:

- international and national nature conservation designations;
- intertidal and subtidal habitats in the Humber Estuary;
- subtidal habitats at the dredge and disposal location;
- fish populations;
- marine mammals;
- SPA bird populations;
- breeding bird populations;
- badgers;
- great crested newts;
- water voles;
- reptiles; and
- bats.

6.4.12 In order to further inform the baseline assessment in the EIA various sources will be used to obtain further information and data on these designated sites. The sources to be used include, but are not limited to:

- National Biodiversity Network Gateway website;
- Joint Nature Conservation Committee website;
- Wetlands International Ramsar Sites Information Service website;
- Environment Agency;
- Marine and Fisheries Agency;
- Institute for Estuarine and Coastal Studies;
- Centre for Environment, Fisheries and Agriculture Science;
- Marine Life Information Network for Britain and Ireland; and
- Bing Maps aerial photography and satellite imagery;

6.4.13 In addition it is recognised that a range of stakeholders will need to be consulted on the issues of ecology and nature conservation during the EIA. It is proposed that specific consultation discussions will be had with bodies including but not limited to:

- Environment Agency;
- Humber Industry Nature Conservation Association;
- Lincolnshire Wildlife Trust;
- North Lincolnshire Council;
- Natural England; and
- Royal Society for the Protection of Birds (RSPB).

Potential Impacts

6.4.14 A large proportion of the terrestrial area of the proposed development has already been developed for car parking and port related storage. It is, therefore, not expected that there will be significant loss of sensitive habitat or species from this area of the proposed development. It is possible that protected species will be identified in other areas of the proposed development, or in the immediate vicinity of the site (eg water vole). The EIA will, following the completion of the appropriate baseline survey work, assess the possible impacts to any sensitive habitats and species and develop suitable mitigation measures to protect both habitats and species.

6.4.15 The proposed new quay development would extend into the Humber Estuary SSSI, Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site and will be located adjacent to the North Killingholme Haven Pits SSSI. The associated onshore infrastructure also has the potential to adversely impact the designated interest features of these protected sites. Potential impacts

to these protected sites are likely to be the key challenge to development at this site and will be assessed in detail in the EIA.

Construction

6.4.16 A preliminary assessment of potential ecological impacts relating to the proposed development site has been undertaken, divided into impacts arising during the construction phase and impacts during the operational phase. The main potential construction phase impacts are summarised in *Table 6.4*.

Table 6.4 Potential Construction Phase Impacts

Source	Potential Impacts on Receptors
Land take for site clearance, construction in the estuary and the implementation of cooling water intake/outfall pipes	• Bird feeding habitat (intertidal mudflats) within the designated sites will be lost; • Non-designated habitats will be lost. These non-designated habitats include arable agricultural land and existing hard standing; • Increased turbidity due to dust generation causing smothering of benthos and decreased light penetration which decreases primary productivity (both probably insignificant as estuarine environments are naturally turbid); • There will be a loss of plant and animal species which inhabit the site of the proposed development; and • There will be loss of land within the estuary reclaimed as part of the new quay which will affect benthic species within the estuarine sediments.
Noise, vibration and visual stimuli (presence of people, machinery and lighting) during construction works	• Noise may arise from construction, however, marine species are unlikely to be affected given that it is a highly industrial area; and • Wintering, autumn passage and breeding birds will be disturbed resulting in a reduction in the numbers and species which use the site and the adjacent estuary shore for roosting and loafing; and • Other fauna not associated with the designated sites will be disturbed, including breeding birds.
Construction run-off and pilling resulting in water and sediment pollution	• Intertidal mud, estuarine sediments and aquatic habitats may be contaminated, which will lead to a reduction in their productivity and value to foraging birds and fish. Potentially resulting in contaminants entering the food chain which could damage the health of terrestrial and aquatic organisms including those for which the Humber Estuary is designated; • Liquid effluent run-off from construction site entering aquatic environment may contain oils or maintenance products from machinery; • Litter accumulation due to increased activity on site could cause negative impacts on both terrestrial and marine based flora and fauna.

Operation

6.4.17 The potential operational phase impacts are identified in *Table 6.5*.

Table 6.5 Operational Phase Impacts

Source	Potential Impacts on Receptors
Landtake for the proposed development and associated facilities both onshore and within the estuary	• direct loss of intertidal (ie mudflat) and estuarine habitat; • possible indirect loss or change to intertidal (ie mudflat) and estuarine habitat as a result of changes to estuary hydrodynamics and sediment regimes; • disturbance or displacement of designated interest feature species (predominantly birds) from the proposed development site; and • down-stream effects of the maintenance dredge plume and sediment disposition.
Noise, vibration and visual stimuli (presence of people, machinery and lighting) during operation of the proposed development	• Noise may arise from operation, however, marine species are unlikely to be effected given that it is a highly industrial area; and • Wintering, autumn passage and breeding birds will be disturbed resulting in a reduction in the numbers and species which use the site and the adjacent estuary shore for roosting and loafing; and • Other fauna not associated with the designated sites will be disturbed, including breeding birds.
Consented discharges causing water and sediment pollution (including the cooling water discharge)	• Liquid effluent run-off from operational site entering aquatic environment may contain oils or maintenance products from machinery; • The restriction of flow in the Killingholme Pits due to silting would lead to the stagnation of the water, resulting in algal proliferation, which will smother habitats and cause damage to the health of the aquatic organisms; • Litter accumulation due to increased activity on site could cause negative impacts on both terrestrial and marine based flora and fauna.
Cooling water abstraction	• Cooling water intake could lead to the entrainment and death of fish species and sea lamprey.
Discharge of airborne pollutants from the power station stack including NO_x, SO_2 and particulate matter	• Sensitive habitats could be negatively impacted by the deposition of air pollutants.

6.4.18 Although it will be possible to mitigate most of the above impacts to a degree (eg through design, timing etc) it is highly unlikely that the impacts could be fully mitigated such that there will be deemed to be no likely significant impact on the Humber designated sites. As such, an *appropriate assessment* will be required to assess whether the

proposed development will adversely [1] affect the integrity of the sites. The carrying out of an *appropriate assessment* will necessitate extensive consultation and engagement with the relevant stakeholders (such as Natural England, Environment Agency and RSPB) to agree issues such as the duration and extent of bird count surveys and viable mitigation measures.

6.4.19 If the *appropriate assessment* indicates that no significant adverse effect will occur on the designated sites the competent authority may proceed to grant consent; if not, further steps are required to demonstrate that the development should nevertheless be permitted before consent may be granted. These further steps can be summarised as follows:

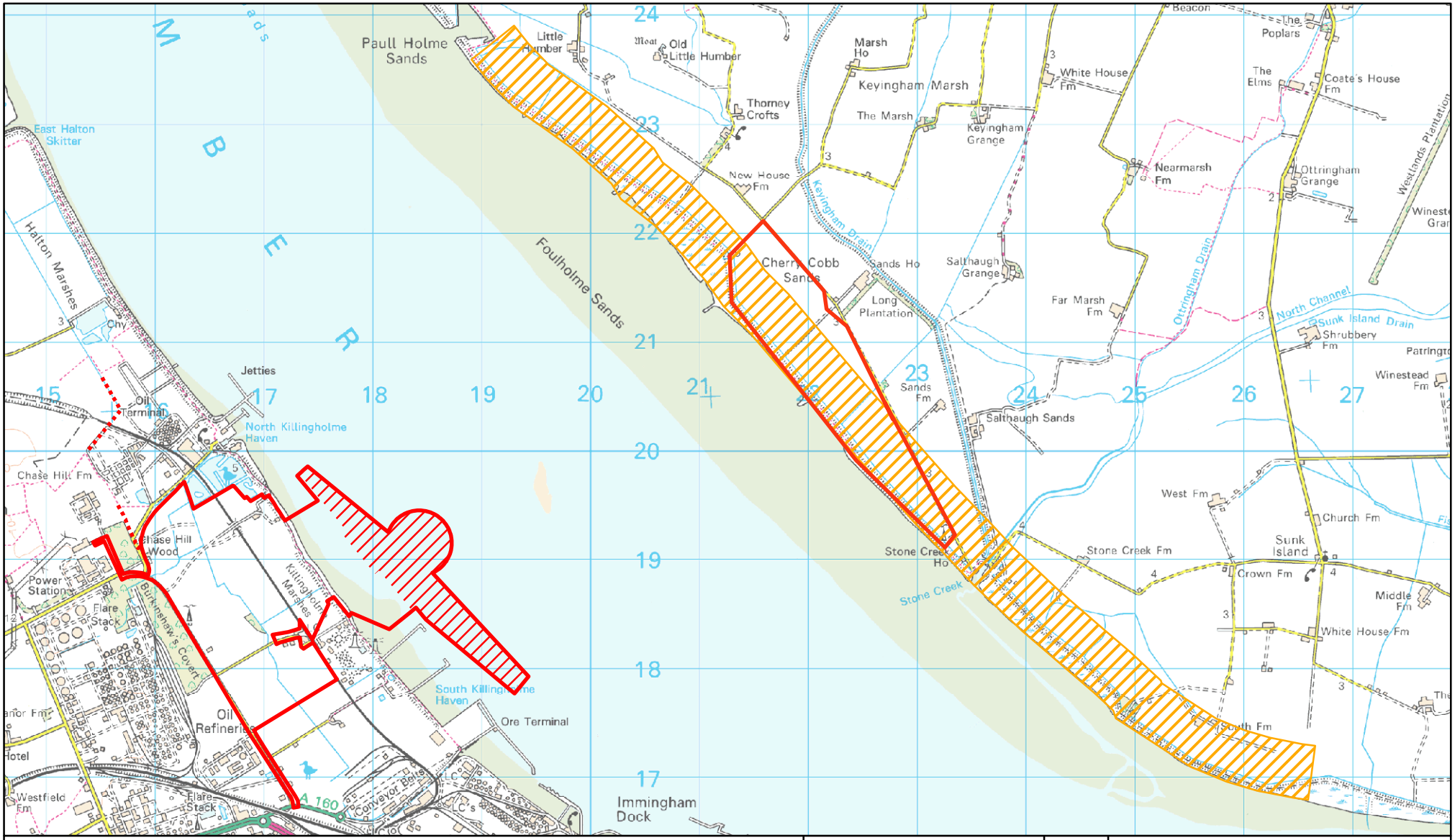
- The competent authority may grant consent, notwithstanding a negative appropriate assessment, if they are satisfied that there are *no alternative solutions* and i*mperative reasons of overriding public interest* as to why the project should be permitted.

- If consent is granted for imperative reasons of overriding public interest the competent authority shall secure that any necessary *compensatory measures* are taken to ensure that the overall coherence of Natura 2000 is protected.

6.4.20 It is acknowledged that unless the *appropriate assessment* for the proposed AMEP development concludes that there will be no adverse affect on the integrity of the sites there will be a requirement to ensure that any necessary compensatory measures are established to ensure that the overall coherence of the designated sites is protected. With this in mind Able has started the process of identifying areas of potential compensatory habitat for the protected habitat that will be lost due to the construction of the new quay. In particular, Able has identified a coastal strip of land on the northern bank of the middle estuary within which it may be possible to develop more detailed plans for the creation of compensatory habitat, as identified in *Figure 6.7*.

6.4.21 The proposals for creation of compensatory habitat will be progressed in discussion with the relevant consultation bodies, including but not limited to Natural England, the Environment Agency, the Crown Estate and relevant local authorities.

[1] When considering whether there is an adverse effect on the integrity of the site, following an appropriate assessment, the Courts have held that such effect would need to be significant in order to trigger the need for mitigation , ADT Auctions Ltd v Secretary of State & Hart DC [2000] JPL 1155



KEY:

- Proposed Development Boundary
- Area of Dredging
- Route of Diverted Footpath
- Proposed Envelope within which Compensatory Habitat will be Created

N / W / E / S

0 1 Kilometre

CLIENT: Able UK Ltd.

SIZE: A4

TITLE: Figure 6.7 Area Envelope Available for Proposed Habitat Creation

ERM
Eaton House
Wallbrook Court
North Hinksey Lane
Oxford OX2 0QS
Telephone: 01865 384800
Facsimile: 01865 204982

DATE: 16/09/2010 | CHECKED: WB | PROJECT: 0119511

DRAWN: IG | APPROVED: SP | SCALE: 1:50,000

PROJECTION: British National Grid

DRAWING: HabitatCreation.mxd

REV: 0

File: 0119511Able_CH_WB\MAPS\HabitatCreation.mxd

Proposed Assessment Methodology

6.4.22 The EIA will describe the impacts of the construction and operational phases on the terrestrial and marine ecology in and around the application site, including impacts on designated sites for nature conservation. The EIA will also identify both direct and indirect impacts and the necessary mitigation measures and additional enhancement to ensure that the residual impact of the proposed development is neutral or positive.

6.4.23 The proposed development will be assessed for potential impacts on ecological and nature conservation in the light of habitats and the species that are likely to be affected by the proposals taking into account the latest *Guidelines for Ecological Impact Assessment in the United Kingdom* published by the Institute of Ecology and Environmental Management (IEEM).

6.4.24 This will include an assessment of impacts to designated sites and habitats and species of interest. One of the impacts that will be considered is the potential for atmospheric deposition on the designated sites identified within 10 km of the proposed site.

6.4.25 As part of the assessment the significance of potential ecological impacts will be evaluated taking into account the following factors:

- the magnitude of both positive and negative effects, as determined by intensity, frequency and by the effect extent in space and time;
- the vulnerability of the habitat or species to the changes likely to arise from the development;
- the ability of the habitat, species or ecosystem to recover, considering both fragility and resilience;
- the viability of component ecological elements and the integrity of ecosystem function, processes and favourable condition;
- value within a defined geographic frame of reference (eg UK, national, regional or district);
- the biodiversity value of affected species, populations, communities, habitats and ecosystems, considering aspects such as rarity, distinct sub-populations of a species, habitat diversity and connectivity, species-rich assemblages, and species distribution and extent; and

- designated site and protected species status, and Priority Biodiversity Action Plan (BAP) or Habitat Action Plan (HAP) status.

6.4.26 The outputs of any required modelling work and Environmental Quality Standards (EQS) calculations will be used to assess the potential impacts of discharges (such as cooling water) on marine ecology. Key considerations will include:

- effects on migratory fish species, in particular those migrating up river to spawn;
- effects on other marine species;
- effects on benthic ecology; and
- disruption to sediment transport pathways and changes to sedimentary characteristics caused by local changes in currents.

6.4.27 In assessing the impact of the proposed development on nature conservation and aquatic ecology the EIA will examine each of the following:

- direct changes to intertidal and subtidal habitats from the proposed development;
- indirect effects on intertidal and subtidal habitats;
- the effects of underwater noise on fish species from construction and dredging activities;
- the effects of dredging and disposal on migratory lamprey;
- the effects of lighting on bird disturbance;
- the effects of construction and operational activities on bird disturbance;
- the effects of construction and operational activities on bird displacement;
- the effects of construction and operational activities on badgers;
- the effects of operational activities on bird collision;

- the effects of construction and operational activities on great crested newts;

- the effects of construction and operational activities on water voles; and

- the effects of construction and operational activities on bats.

6.4.28 It is important to note that throughout the EIA the methodologies for assessment of impacts on ecological features and designated sites and the findings of the assessment will be discussed and agreed with the relevant stakeholders including, but not limited to Natural England, the Environment Agency, RSPB and the Wildlife Trusts.

6.5 COMMERCIAL FISHERIES

Introduction

6.5.1 This section addresses the issue of commercial fisheries and details the proposed approach to assessing the impacts of the proposed development on commercial fisheries.

Baseline Conditions and Sensitivities

6.5.2 Both commercial and recreational fishing takes place in the Humber Estuary. Species fished include sole (*Solea solea*), shrimp (*Crangon crangon*), whiting (*Merlangius merlangus*), cod (*Gadus morhua*), a shellfish fishery for cockles (*Cerastoderma edule*), and three fisheries for diadromous fish species, namely Atlantic salmon (*Salmo salar*), sea trout (*Salmo trutta*), and eels (*Anguilla anguilla*).

6.5.3 The estuary is also an important spawning and nursery ground for some commercially important species, including sole (*S. solea*) and lemon sole (*Microstomus kitt*), herring (*Clupea sp*), plaice (*Pleuronectes platessa*) and sprat (*Sprattus sprattus*).

6.5.4 Marine fisheries within the Humber Estuary are regulated by the North Eastern Sea Fisheries Committee (NESFC) and the Eastern Joint Fisheries Committee, whilst those for diadromous (freshwater / estuarine) species by the Environment Agency. Both organisations issue permits and licenses for the right to fish. The NESFC and Eastern Joint Fishery Committee have certain powers to make bylaws and regulate through the use of permits, assessment of stock levels, fish minimum landing size and other technical measures such as minimum mesh sizes.

6.5.5 Naturally occurring factors that can potentially affect fishing in the estuary are those of erosion and deposition cycles in the estuary, which may move sediments and cause smothering of nursery and feeding areas of fishes. This can also change the suitability of an area for maintaining shellfish populations.

6.5.6 It is thought that over fishing in the North Sea can reduce the spawning populations and thus the return of nursery stages of marine fish, such as plaice (*Pleuronectes platessa*), to the estuary. Equally, over fishing in the estuary or the loss of intertidal or subtidal habitat, used both for feeding and spawning, can reduce the populations of diadromous fish. Spawning areas can also be lost through the process of aggregate extraction in adjacent marine areas, thus reducing the population of species entering the estuary.

6.5.7 The main fishing activities in and around the Humber estuary include the following:

- Trawling takes place in the middle and outer estuary down to the limit of the Humber estuary European marine site at Donna Nook. Trawling for sole also takes place around the area of Donna Nook.

- Long lining takes place throughout the year; vessels work lines for whitefish within the estuary. Long lining for cod takes place mainly in winter on the stretch of coast between Donna Nook and East Halton on the south bank, and Old Hall on the north bank.

- Eel fishing takes place along the fringes of the estuary and is regulated and licensed by the Environment Agency. The traps used are normally of the "Dutch Fyke" design, but strings of "Criggs" (basket like structures) are being increasingly used.

- Cockle gathering takes place on one main bed located close to Grainthorpe Haven, near Horseshoe Point, on the south bank of the Humber Estuary. Limited gathering also takes place on a smaller bed located on Cleethorpes foreshore. At present, there are approximately 30 permit holders, who are limited to hand gathering throughout the year, however, the main season is late summer/autumn.

6.5.8 It is not thought that extensive commercial fishing occurs in the middle estuary or in the vicinity of the proposed development. The majority of the fishing fleets in the Humber target grounds in the North Sea offshore from the estuary itself.

6.5.9 The current management objectives, both European and national, are aimed at the conservation of particular species, to achieve sustainable fisheries.

6.5.10 As part of the more detailed assessment of the fishing baseline in the EIA, specific discussions will be held with relevant stakeholders including but not limited to the Environment Agency, Sea Fisheries Committees and fishing and angling interest groups.

Potential Impacts

6.5.11 As a result of the works proposed in the intertidal and subtidal environments in the estuary (for example dredging and quay construction) the project has the potential to cause impacts on fisheries and fishing interests, as such it will be assessed as part of the EIA. In particular any changes to the hydrodynamic/sedimentary regime or water/sediment quality that may affect the potential spawning and nursery grounds in the estuary will be assessed (see *Section 6.2*).

Construction

6.5.12 The potential impacts on commercial fisheries that may arise during the construction phase are preliminarily identified in *Table 6.6*.

Table 6.6 Potential Impacts during the Construction Phase

Source	Potential impact
Exclusion from established fishing grounds	During the construction phase a safety zone around the construction vessels will be implemented. This is likely to result in a short term displacement of any fishing effort occurring in the immediate vicinity. Given the mobile nature of the fishing activity in the area, it is unlikely that there would be a significant effect during the construction phase. A Commercial Fisheries Management Plan will be established which will outline the requirements for the management of commercial fisheries during the construction phase.
Displacement of, or reduction in, fish and shellfish resources	There is the potential for a temporary displacement of sensitive fish species from the area of the construction works as a result of increased levels of underwater noise or sediment release associated with construction activities. This displacement could potentially have an effect on local fishing vessels, which may have to relocate to find the target species. Given the short term nature of any construction impacts it is not anticipated that significant effects will arise.

Source	Potential impact
Loss or damage to gear	The potential exists for the loss of fishing gear as a result of construction activities and increased vessel activity. The location and timing of construction activities planned, and/or hazards to fishing operations will be widely broadcast through Notice to Mariners, Kingfisher Bulletin and through frequent direct communication with the fishing industry. As such fishermen will have prior notice to allow for static gear to be removed from construction areas.

Operation

6.5.13 The potential impacts on commercial fisheries that may arise during the operational phase are identified in *Table 6.7*.

Table 6.7 Potential Impacts during the Operational Phase

Source	Potential impact
Increased conflict over diminished fishing ground	During the operational phase of the proposed development fishing vessels will be restricted from fishing within the vicinity of the new quay and on the shipping lines during the shipping of turbines out to their sites offshore. Fishing vessels may be forced to fish other grounds and increase fishing pressures in certain areas.
Displacement of, or reduction in, fish and shellfish resources	There is the potential for a permanent displacement of sensitive fish species from the area of the construction works as a result of changes in the sedimentary and hydrodynamic regimes in the vicinity of the new quay. This displacement could potentially have an effect on local fishing vessels, which may have to relocate to find the target species.
Loss or damage to gear	Due to the higher level of shipping that will arise due to the operation of the proposed development there is the potential of snagging hazards of fishing gears.

Proposed Assessment Methodology

6.5.14 Local fishing industry representatives and organisations will be contacted at an early stage in the EIA process to establish information on the scale and seasonality of fishing activities in the area as well as for their opinion as to the potential harm it may cause.

6.5.15 In line with recommended guidance, the EIA will identify the major commercial fish and shellfish species in the area, describing the fisheries, species and their seasonality. This will be done through

obtaining official UK landings and fishing effort data where possible. Specific studies and information will be used to support the desk based assessment, along with information collected through consultation with the relevant authorities, including the sea fisheries committees, Fishery Producers Organisations and relevant fisheries management organisations.

6.5.16 The assessment of the potential impacts on fish during construction and operational phases will be informed by the outcomes of the various other assessments including the hydrodynamic and sediment regime assessments, water quality assessments and the noise assessments. Through analysing the results of the assessments it will be possible to determine the effect of the proposed development on the commercial fisheries habitats and the effects on the species present in the Humber estuary, focussing on commercial species.

6.5.17 The assessment of the impacts on the commercial fish species will in turn inform the assessment of the impacts on the fishing industry. This assessment will be further informed by the findings of the assessment of the navigational assessments which will identify how fishing may be restricted during both the construction and operational phases of the proposed development.

6.5.18 The implications of the proposed development's construction and operation to the fishing industry and the economic impacts will be assessed and discussed, drawing on knowledge and studies of existing developments on the Humber estuary. Where appropriate effective mitigation measures will also be suggested.

6.6 DRAINAGE AND FLOOD RISK

Introduction

6.6.1 This section addresses the issue of drainage and flood risk and details the proposed approach to assessing the impacts of the proposed development on drainage.

Baseline Conditions and Sensitivities

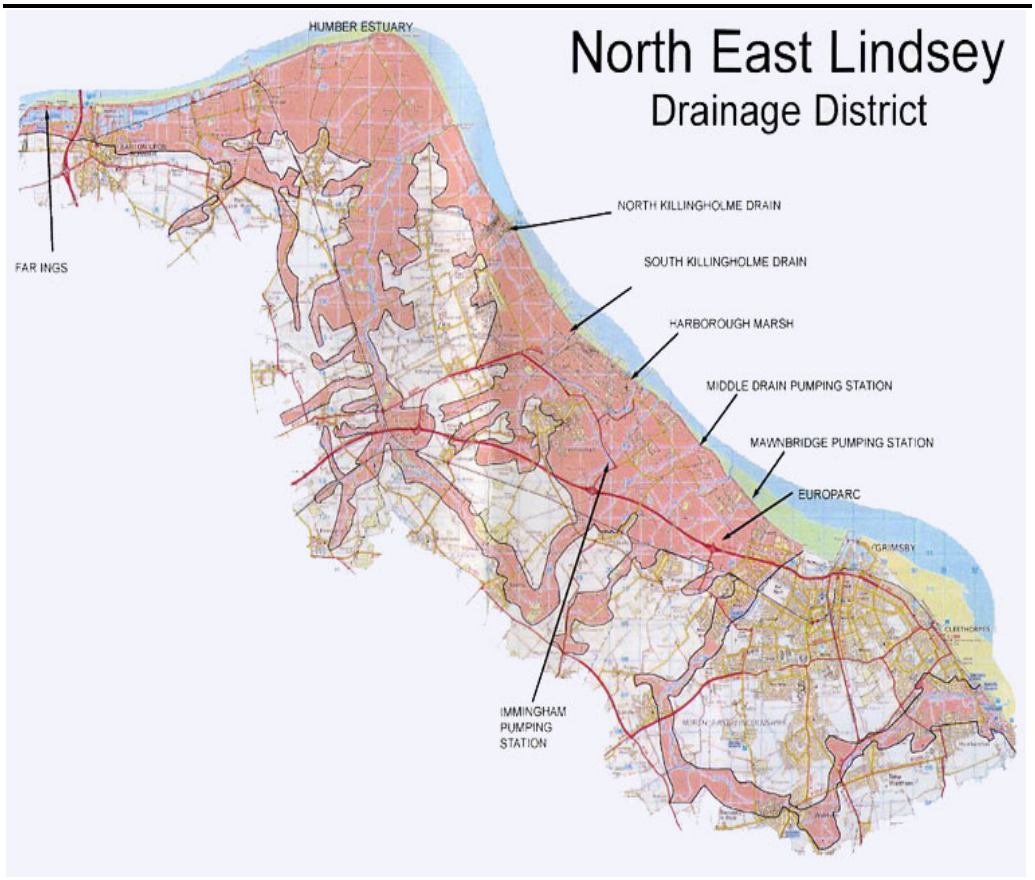
6.6.2 Currently, approximately 90,000 ha of land around the Humber is believed to be at risk of being flooded by a storm surge in the North Sea, including cities such as Hull and Grimsby, as well as smaller towns and villages. The area also contains major industries, including power stations, refineries and the country's largest port complex, handling 80 million tonnes of cargo each year. Most of the remaining land, over 85

per cent of the total, is farmed and consequently has relatively few people living on it.

6.6.3 The site of the proposed development lies within the North East Lindsey Drainage Board's District, which is responsible for the drainage district extending from the Humber Bridge to Cleethorpes and is comprised of a strip of land along the coast with a total area of 11,736 ha.

6.6.4 The area of land under residential property and industrial property (ie lands not classed as agricultural lands) totals approximately 3,700 ha. The drainage of the district is dependent upon both gravity outfalls and pumping to the Humber estuary, with the Board being responsible for approximately 130 km of the watercourses of which 27 km are vital to the continual protection of intensely developed areas.

Figure 6.8 North East Lindsey Drainage District



Source: http://www.northeastlindsey-idb.org.uk/mapofarea.php?fs

6.6.5 The key details of the district are as identified in *Table 6.8*.

Table 6.8 North East Lindsey Drainage District Key Details

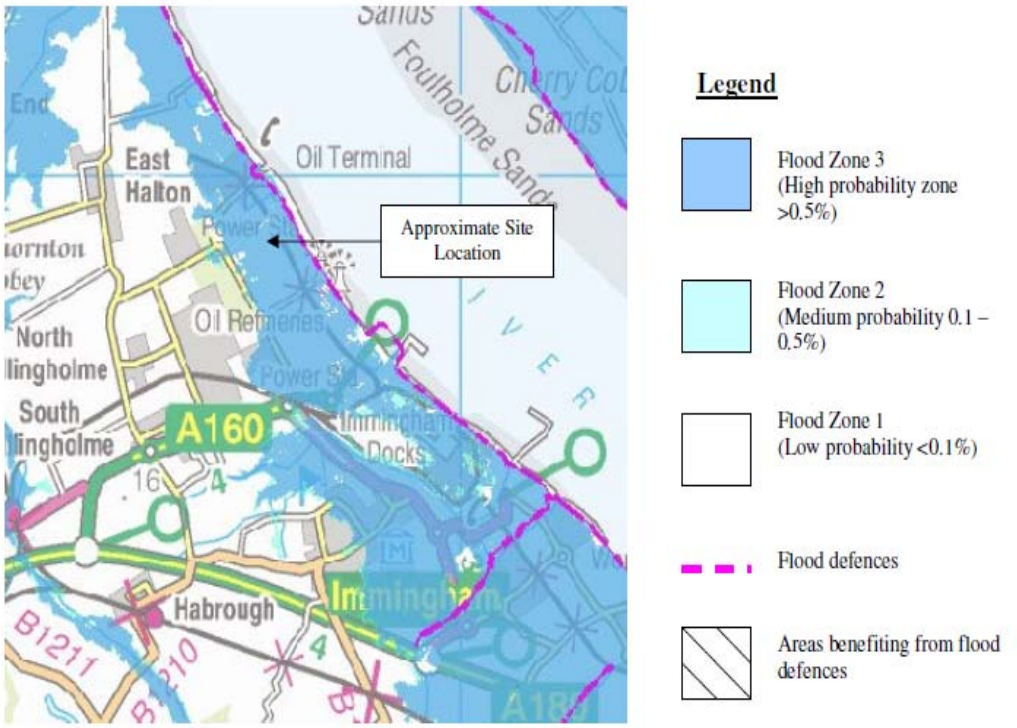
Issue	Measure
Catchment Area draining to and including the District	47,000 ha
Total area of the District	11,736 ha
Area of Agricultural land	8,036 ha
Area of Residential Property	2,300 ha
Area of Industrial Property	1,400 ha
Pumping Stations	6 No
Other Water Level Structures	6 No
Watercourses	187 km
Critical Watercourses	40 km
Raised Embankments	3 km
Passing through or adjacent to the District are the following assets maintained by:	
(i) Environment Agency	
Main Rivers	44 km
Tidal Flood Defences	26 km
Embankment Watercourses	23 km
Tidal Doors	14 No
(ii) Associated British Ports	
Tidal Flood Plains	3 km
Tidal Doors	1 No

Source: http://www.northeastlindsey-idb.org.uk/mapofarea.php?fs

6.6.6 The Humber Estuary forms the north eastern boundary of the proposed development site. The site of the proposed development lies within Flood Zone 3 as delineated by the Environment Agency's indicative Flood Zone maps. This places the site at risk from at least the 1 in 200 year tidal event from the River Humber, which equates to greater than a 0.5 percent annual exceedence probability.

6.6.7 The proposed development fits the Vulnerability Classification of "Water-compatible Development", in accordance with Table D.2 of PPS 25.

Figure 6.9 The Proposed Development Site in relation to the Environment Agency's Flood Zone Map



Source: Environment Agency Flood Zone map [www.environment-agency.gov.uk]

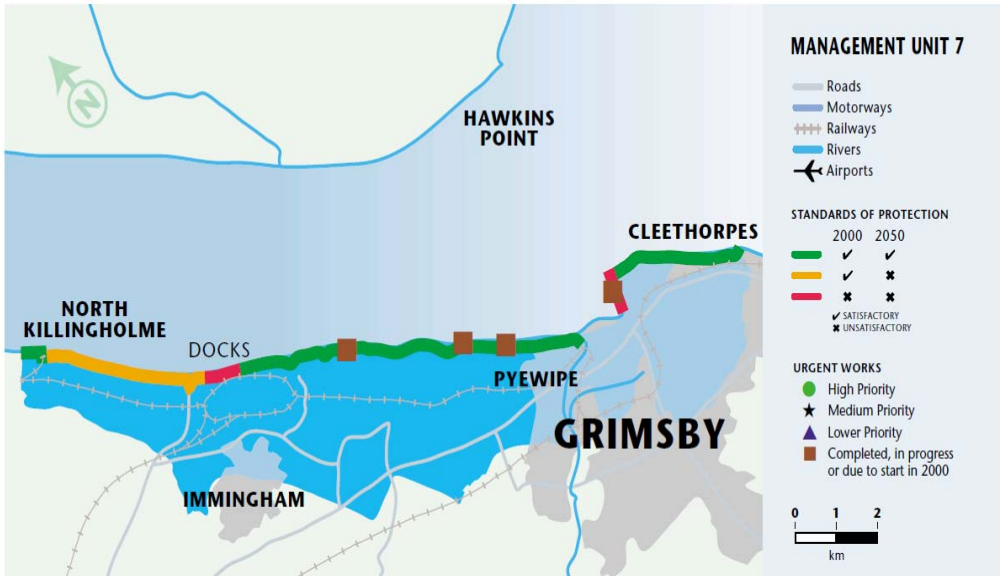
6.6.8 The Environment Agency are responsible for the maintaining and managing flood defences on the Humber and will be the primary stakeholder for the proposed development on this issue.

6.6.9 Flood defences in the area generally consist of earth embankments, mostly with rock or stone revetment and concrete wave walls (*Figure 6.10*). It is thought that erosion is taking place close to the proposed site at North Killingholme, and there is concern that this may threaten the future stability of the existing defences. The current strategy for flood defences in the area is to "hold the line" (ie maintain the defences), although it is acknowledged that continued erosion may make this difficult in the long term and realignment may be necessary. Therefore, the Environment Agency currently recommends that a buffer strip is maintained between the estuary and any new development to allow for work that may be needed in the future.

Figure 6.10 Estuary Flood Defences at Site

6.6.10 The Environment Agency recently published the *Humber Flood Risk Management Strategy*. The Agency are currently planning to improve the standard of flood protection at this location within 10 to 20 years, depending on the actual rate of sea level rise. The report indicates that the Agency will work with the local and regional authorities, property owners and developers to make sure that flood risk is taken into account at all stages of the planning process. However, the report also states that the Agency will work with the local planning authorities to avoid any permanent buildings being located immediately behind the defences and although works will be carried out to improve defences that protect existing development they will expect developers to pay the full cost of any new works needed to protect their development.

Figure 6.11 Flood Defences in Shoreline Management Plan Unit 7



Source: Humber Estuary Shoreline management Plan, Environment Agency, 2000

Potential Impacts

6.6.11 Over recent years there has been an increasing focus and importance attached to the risk of coastal flooding in the Humber, partly in recognition of the risks posed by sea level rise and coastal squeeze which are likely to increase pressure on the existing flood defences in the area.

6.6.12 Impacts on drainage and flood risk during the construction and operational phases of the proposed development will be assessed during the EIA. There is the potential for both impacts from flooding as well as the impact of the proposed development on flood risk within the vicinity of the proposed development.

6.6.13 As well as the risk of coastal flooding there is a lesser risk of flooding from the land side which will also be assessed as part of the assessment.

Construction

6.6.14 While there is little or no risk of climate change resulting in a sea level rise during the course of the construction phase of the proposed development there is the risk of flooding from extreme tidal events.

6.6.15 There is also the possibility that construction on the site could result in impacts on surface water systems and drainage which may lead to ponding or flooding on site which can result in uncontrolled discharges to the estuary or adjacent Killingholme Pits SSSI.

Operation

6.6.16 During the operational phase of the proposed development there is the potential for impacts on flood risk due to sea level changes. Changes to the sea level would increase the likelihood of the proposed development site or surrounding areas being flooded during extreme tidal events.

6.6.17 In addition, the operation of the proposed development will require an increase in the amount of hard standing area on the proposed development site, thereby reducing the infiltration rate of the soils and increasing the volume of surface run-off. If surface run-off exceeds the volume which the surface water management system is capable of handling there could be ponding and flooding of the site.

6.6.18 Land raisings on site could lead to the displacement of flood water and changes to the surface water run-off pathways, increasing the flood risk to the surrounding areas. However, the raising of the base level on the site will improve the existing level of protection against flooding. In order to ensure that there is no increase in the flood risk to adjacent areas any changes to surface water run-off pathways will be designed as part of a surface water drainage system.

Proposed Assessment Methodology

6.6.19 Taking into account the importance of the issues of flooding and the risks associated with coastal flooding it will be essential for the EIA to rigorously assess the impact of the development on flood risk and whether the existing defences provide sufficient protection. This will require extensive consultation with the Environment Agency. Other stakeholders that will be consulted in relation to the issue of drainage will include the North Lincolnshire Council, and the North East Lindsey Drainage Board as well as adjacent land users.

6.6.20 A comprehensive Flood Risk Assessment (FRA) will be undertaken based on quantitative thresholds and the methodology finalised during the EIA. The FRA will need to demonstrate that the proposed development will not adversely affect the Humber Estuary's flood defences. It will also need to assess the impact of the development on surface water within the site.

6.6.21 *Planning Policy Statement 25: Development and Flood Risk* (2010) seeks to provide clearer and more robust guidance to ensure that current and future flood risk is taken into account at all levels within the planning system. Under this guidance more reliance is placed on the development of appropriate flood risk assessments at the regional, local

and site specific level, which seeks to divert development away from flood risk areas and match land allocations to appropriate users.

6.6.22 The impact of the proposed development on the hydrological environment at the site will be evaluated in the EIA to determine the likelihood of the proposed development causing impacts to the surface water environments as follows:

- impacts on land drainage and flooding;
- impacts on the underlying groundwater system, in regard to groundwater quality; and
- impacts associated with the pollution of surface watercourses during construction, operation and decommissioning.

6.6.23 Information will also be sought from stakeholders through the consultation process and it is anticipated that this information will include data on flooding history, extreme tidal, fluvial events and flood defence heights. This information will be used to develop a baseline description of the proposed development site. The Environment Agency's national Flood and Coastal Defence Database will be accessed to gain further information and data which will inform the baseline for this topic. All the information and data obtained will be compiled and assessed in conjunction with a detailed topographic survey of the site to determine the level of flood risk at the site.

6.6.24 A scale map will be used to determine the extent, depth and flood flow pathways for the site for appropriate return periods. The flood risk assessment will assess the possible speed and rate of inundation of the site and the order in which the separate areas of the proposed development site might flood. Future changes to the baseline flood risk will be assessed in light of information regarding changes to the relative sea levels, changes in groundwater levels and increases in surface water run-off. In order to determine the likely impact of the development on water levels within watercourses in the vicinity of the proposed development existing and post development run-off rates will be extrapolated from existing baseline data. This assessment will determine if the proposed development requires any on-site water storage to limit the amount of surface run-off during periods of high surface water run-off which could potentially cause flooding on adjacent lands.

6.6.25 Design floor levels will be determined taking into account the possibility of flood defences overtopping. The assessment will also examine the issues of safe emergency access and egress during extreme

flood events and will indicate what depths of water will be encountered at separate areas of the site during such an extreme flood event.

6.7 NOISE AND VIBRATION

Introduction

6.7.1 This section addresses the issue of noise and details the proposed approach to assessing the impacts of the proposed development on sensitive noise receptors.

Baseline Conditions and Sensitivities

6.7.2 The proposed development is located in a largely industrial area, so it is likely that there are elevated noise levels both in and around the proposed site. In particular, the site and the surrounding area is already extensively used for car storage and export and import, therefore vehicle movements around the site are a regular occurrence. Other existing noise sources will include the nearby oil refineries, power stations, rail freight line and nearby docks, vessel movements and roads. There are currently three isolated residential properties adjacent (ie within 100m) of the boundaries of the proposed development site which will be the nearest residential receptors that may be exposed to noise impacts; however, the nearest residential communities are over 2 km from the site.

6.7.3 An ambient noise monitoring study will be carried out at the site of the proposed development to establish the baseline. This will involve a baseline survey at the nearest noise sensitive receptors in order to determine the currently prevailing noise climate, which will be used as part of the assessment.

6.7.4 The baseline will be further informed by noise monitoring previously undertaken at the proposed development site and the surrounding areas as part of previous projects.

6.7.5 All of the information from baseline noise monitoring will be compiled to develop an understanding of the existing noise impacts from the existing and surrounding developments. North Lincolnshire Council and the Natural England will be consulted to ensure that the scope of the noise monitoring is sufficient to assess the impacts on both sensitive human and ecological noise receptors in the vicinity of the proposed development.

Potential Impacts

6.7.6 Noise impacts will result from construction works, particularly the piling and breaking of hard ground and also increased traffic. It is possible that this will present a significant noise impact on the nearest three residential properties to the site and therefore this will be assessed in the EIA. It is less likely that the nearest communities will be impacted by construction noise on site given that they are approximately 2 km from site; however, the potential for impacts will nonetheless be assessed in the EIA.

6.7.7 One of the additional issues with regard to noise will be the potential impacts on bird species that use the intertidal area and nearby North Killingholme Pits SSSI. Increased noise, particularly during the construction phase of the proposed development, will potentially result in some disturbance to bird species (and hence the interest features of the designated SPA site). It is likely that mitigation measures will be required during the construction phase to ensure that noise is minimised as far as reasonably practicable. It may be necessary, depending on the findings of the assessment to restrict noisy construction activities (eg piling) to avoid peak bird use periods.

6.7.8 There will also, potentially, be impacts from underwater noise on marine ecology, especially during the construction phase of the proposed development. This will include impacts on marine fish species, mammals and invertebrates. The impacts on these species as a result of noise impacts will be assessed as part of the ecology and nature conservation assessments, utilising the results of the noise assessment.

Construction

6.7.9 identifies the main sources of noise impacts and the potential receptors which they may impact upon during the construction phase of the proposed development.

Table 6.9 Noise Impacts during Construction

Source of noise	Potential Impact on sensitive receptors
Construction activity on-shore	Construction activity on-shore may impact the nearest three residential dwellings on the boundaries of the site. Communities are less likely to be impacted due to their distance from the proposed development site. Disturbance to ecological receptors, in particular bird species, will also be an important potential impact for consideration in the EIA.

Source of noise	Potential Impact on sensitive receptors
Construction activity in the estuary	Underwater noise generated by construction activity within the estuary may negatively impact on marine ecology.
Increased levels of traffic/shipping	Although the number of vehicle movements during the construction phase has not yet been determined it is likely that there will be an increase in noise levels along some routes depending on the existing traffic volumes. This might result in impacts on sensitive human receptors in the vicinity of these routes. While the increase in road/rail based traffic will not significantly impact on sensitive terrestrial ecology it is possible that the increase in shipping associated with the construction of the proposed development will negatively impact on sensitive marine ecology.

Operation

6.7.10 *Table 6.10* identifies the main sources of noise impacts and the potential receptors which they may impact upon during the operational phase of the proposed development.

Table 6.10 Noise Impacts during Operation

Source of noise	Impact on sensitive receptor
Operational activity on-shore	Operational activity on the site may impact the nearest three residential dwellings on the boundaries of the site. Communities are less likely to be impacted due to their distance from the proposed development site. Disturbance to ecological receptors, in particular bird species, will also be an important potential impact for consideration in the EIA.
Increased levels of traffic/shipping	Although the number of vehicle movements during the operational phase has not yet been determined it is likely that there will be an increase in noise levels along some routes depending on the existing traffic volumes. This might result in impacts on sensitive human receptors in the vicinity of these routes. While the increase in road/rail based traffic will not significantly impact on sensitive terrestrial ecology it is possible that the increase in shipping associated with the operation of the proposed development will negatively impact on sensitive marine ecology.

Proposed Assessment Methodology

6.7.11 Existing noise levels will be monitored at the nearest noise sensitive receptors, currently believed to be the closest three residential dwellings and adjacent areas used by birds. The locations for monitoring noise levels will be determined through consultation with North Lincolnshire Council and other relevant consultees. It is anticipated that the noise levels will be largely dominated by industrial noise. Noise will be assessed in relation to measurements taken of existing noise levels and relevant criteria as discussed below. The noise

impact assessment will be conducted in accordance the British Standard 7445.

6.7.12 With regards to construction noise, noise levels will be predicted using the methods set out in British Standard 5228. The assessment criteria which will be used for evaluating the significance of construction noise are based on criteria set out in the Department of the Environment (DoE) Advisory Leaflet 72.

Table 6.11 Threshold Criteria for Evaluating the Effects of Noise during Construction

Period	Building/Location	Criteria for Assessment $L_{Aeq, period}$	Purpose
Daytime (0700 - 1900)	Dwellings/Offices (facade)	75 dB	To maintain speech intelligibility
	Schools	65 dB	To maintain speech intelligibility in classrooms
Evening (1900 - 2300)	Dwellings (facade)	65 dB (1)	To avoid disturbance
Night-time (2300 - 0700)	Dwellings (facade)	45 dB(2)	To avoid sleep disturbance

(1) Although BS 5228 does not propose noise criteria for daytime periods, it suggests that acceptable noise levels in the evening may need to be 10 dB(A) lower than daytime levels. For the purpose of this assessment, the evening has been defined as 1900 to 2300 hours.
(2) or equal to ambient L_{Aeq} levels if the ambient noise level is higher than 45 dB.

6.7.13 The approach which will be adopted in the assessment will be to determine the potential noise effects from construction activities and to compare predicted noise levels for each construction phase with the noise criteria in *Table 6.11*. In cases where predictions show that these criteria will be exceeded for at least a few days, a significant potential effect will be reported.

6.7.14 The main sources of noise from the operation of the proposed development are likely to be noise from the turbine manufacturing processes, the biomass facility and potentially the wind turbines on site. Noise effects resulting from operational traffic will also be assessed as the increase in traffic over the baseline may potentially be significant.

6.7.15 The assessment of fixed plant noise will take into consideration the nature of the noise to be assessed and will use the criteria provided in British Standard 4142, which describes a method for rating industrial noise affecting mixed residential and industrial areas.

6.7.16 The assessment of noise due to the operation of the two on-site wind turbines will be assessed in accordance with ETSU-R-97, *The Assessment and Rating of Noise from Wind Farms*. In accordance with this guidance, if the assessment predicts that the noise generated by the operation of fixed plant is likely to reach a level which may lead to noise complaints, and mitigation cannot be specified to avoid this, a significant impact will be reported in the EIA.

6.7.17 The noise assessment related to construction traffic will take into consideration the nature of the noise to be assessed and will take account of the following guidance as appropriate:

- Calculation of Road Traffic Noise (CRTN), 1988
- Planning Policy Guidance Note 24, Planning and Noise, 1994.

6.7.18 A comparison of the predicted noise levels with the assessment standards will identify areas where impacts can be expected and where mitigation would be needed. Some mitigation measures may be in the form of design standards that will have to be met by the eventual contractor. Appropriate mitigation options will be identified, but their detailed design would be undertaken after the EIA during the detailed design phase.

6.7.19 Underwater noise levels in the marine environment will be determined through desk-based research and utilising previous research undertaken and data compiled on the issue.

6.7.20 The findings of the noise assessment will be utilised in the assessment of the impacts on ecology and nature conservation to determine the impact of increased noise levels on both marine and terrestrial ecology.

6.8 AIR QUALITY

Introduction

6.8.1 This section details the approach to be used in assessing the potential impacts of the proposed development on air quality.

Baseline Conditions and Sensitivities

6.8.2 The proposed development lies within a heavily industrialised area. The nearest residential communities are East Halton and North Killingholme, located approximately 2-3 km from the proposed development site. However, as noted there are also three other isolated residential properties much closer to the proposed development site i.e.

within 100 m of the site boundary, which will be important receptors to consider in the air quality assessment. In addition, currently a public footpath runs adjacent to the proposed development site, along the top of the flood defences.

6.8.3 Due to the fact that the proposed development is relatively close to the administrative area of North East Lincolnshire it is necessary to explore the baseline air quality within both the North Lincolnshire and North East Lincolnshire areas.

North Lincolnshire

6.8.4 North Lincolnshire Council conducts ambient air quality monitoring for the following pollutants:

- PM_{10}
- NO_2
- SO_2
- benzene
- polycyclic aromatic hydrocarbons (PAH).

6.8.5 PM_{10} originates from a variety of sources, including industry, road traffic and natural sources such as soil dust and sea salt. North Lincolnshire Council has declared an Air Quality Management Area (AQMA) in the Scunthorpe area for a breach of the daily air quality objective. The annual and daily PM_{10} objectives are being breached in Low Santon (Scunthorpe). The results from East Common Lane are very close to the daily objective, while Scunthorpe Town has met the objective in two of the three years spanning 2005 to 2008.

6.8.6 The main sources of NO_2 (nitrogen dioxide) in North Lincolnshire are road traffic and industrial combustion processes. North Lincolnshire Council currently operates 36 diffusion tubes and five automatic analysers monitoring NO_2. As a result of the Updating and Screening Assessment in 2006, North Lincolnshire Council carried out a detailed assessment for NO_2. Monitoring has shown that objectives for NO_2 have not been breached during the monitoring period. NO_2 concentrations have, in fact, decreased at the Scunthorpe Town and Killingholme sites, although the concentrations are increasing at Kingsway House.

6.8.7 SO_2 (sulphur dioxide) is currently monitored automatically at three locations in North Lincolnshire. The primary source of SO_2 is from industrial combustion processes. The SO_2 objectives have not been breached in North Lincolnshire since monitoring began in 1997. At the

main Scunthorpe site the concentration of SO_2 and the number of exceedences of the 15-minute limit value have shown a significant decrease since 1998. Conoco Phillips has increased the height of its stack to reduce SO_2 concentrations in the Killingholme area, thus eliminating a potential breach of the 15-minute limit value at this location.

6.8.8 The main sources of benzene in North Lincolnshire are exhaust emissions from road traffic, industrial emissions from the two refineries at Killingholme and the Corus and Koppers operations in Scunthorpe. North Lincolnshire Council carried out a detailed assessment of benzene in the Killingholme and Scunthorpe areas in 2004. The benzene objective was not breached during that monitoring.

6.8.9 Monitoring for poly-aromatic hydrocarbons (PAHs) is carried out at one site in Scunthorpe, using two machines for a co-location study. The European standard (compliance date end of 2012) has not been breached at the Scunthorpe Town site since 2003. However, the UK strategic target value recommended by the Expert Panel on Air Quality Standards (compliance date end of 2010) has been breached every year since 1999. Monitoring of heavy metals and $PM_{2.5}$ commenced in the Scunthorpe area in May 2008.

6.8.10 The main industrial sources of 1,3 butadiene in North Lincolnshire are the two refineries at Killingholme. Road traffic is also a contributor. North Lincolnshire Council carried out a detailed assessment for 1,3 butadiene in the Killingholme area in 2006. Results showed that the objective was not being breached.

6.8.11 The introduction of catalytic converters has reduced CO (carbon monoxide) emissions from road traffic. The other source of this pollutant in North Lincolnshire is from local industry, such as the steelworks in Scunthorpe. Monitoring for CO was carried out at the Scunthorpe Town site (on Rowland Road) during 2005. The objective was not breached during the monitoring.

6.8.12 The introduction of unleaded petrol has reduced lead emissions from road traffic. The most significant source in North Lincolnshire is the steelworks site in Scunthorpe. As a result of the Updating and Screening Assessment in 2006, North Lincolnshire Council carried out a detailed assessment for lead in the Scunthorpe area. Results of lead monitoring carried out during 2006 and 2007 showed that the objective was not being breached.

6.8.13 Monitoring for ozone is not currently carried out in North Lincolnshire, as ozone is not studied in detail by Local Authorities. This is because the formation of ozone occurs away from the sources of the pollutants that generate it.

North East Lincolnshire

6.8.14 North East Lincolnshire Council currently monitors for:

- PM_{10}
- NO_2
- SO_2
- benzene
- ozone.

6.8.15 North East Lincolnshire Council has three air quality monitoring stations located at Fryston House Grimsby, Kings Road Immingham and Woodlands Avenue Immingham. These stations can monitor the levels of specific pollutants in real time, and because of this they can detect short pollution incidents. The data provided by the stations is used to ascertain whether compliance with the National Air Quality Standards is occurring.

6.8.16 North East Lincolnshire Council currently has a passive air quality monitoring network consisting of 34 NO_2 diffusion tubes and 1 benzene diffusion tube. They are located where potential pollution problems may occur.

6.8.17 North East Lincolnshire Council designated an AQMA in Immingham in October 2006; the PM_{10} 24 hour mean objective had been exceeded in 2004 and in 2005. The AQMA includes a residential area on Kings Road and Pelham Road, Immingham.

6.8.18 The PM_{10} exceedences measured in the AQMA are likely to be due to a variety of reasons including local dust re-suspension generated by high HGV traffic on Kings Road, as well as coal storage and various industrial activities in Immingham Docks.

6.8.19 The Local Air Quality Management Progress Report (2010) makes several conclusions regarding the air quality in North East Lincolnshire:

- Frystown House, Grimsby – some NO_2 concentrations which are just over the National Standard. However, properties in the area at least 10 m from the kerb, therefore it is unlikely that the NO_2 annual mean Air Quality Standard would be exceeded at the façade of the

properties. The data recorded for PM_{10} were within the requirements of the objectives.

- Peaks Parkway, Grimsby – again some NO_2 concentrations are just over the National Standard but it is unlikely that the NO_2 annual mean Air Quality Standard would be exceeded at the façade of the properties.

- Riby Square, Grimsby - NO_2 concentrations in excess of the National Standard and therefore require a Detailed Assessment based on the risk of exceedence of the NO_2 annual mean Air Quality Standard objective in the area.

- Kings Road, Immingham - again some NO_2 concentrations are just over the National Standard but it is unlikely that the NO_2 annual mean Air Quality Standard would be exceeded at the façade of the properties. The PM_{10} recordings at this location were below the objective.

- Woodlands Avenue, Immingham – the data recorded for NO_2, SO_2, PM_{10} were within the requirements of the objectives.

Sensitivities

6.8.20 Within a 10 km radius of the proposed development there are several designated sites, including the Humber Estuary Ramsar Site (UK11031), the Humber Estuary SAC (UK0030170), the Humber Estuary SPA (UK9006111), the Humber Flats, Marshes and Coast Important Bird Area (90022), North Killingholme Haven Pits SSSI (1006646), the Humber Estuary SSSI (1009830) and the Kirmington Pit SSSI (1003270).

6.8.21 The Humber Estuary includes habitats of intertidal mudflats, sandflats and coastal saltmarsh. Due to the sensitivity of these designated habitats the EIA will consider the impacts on these designated sites due to air quality changes. The EIA will also examine the potential impacts on locally important Sites for Nature Conservation in the surrounding 10 km. The need to examine these sites when undertaking the stack emissions study is dependent upon the presence of species sensitive to air pollution, which will be determined during the EIA.

6.8.22 Within the vicinity of the proposed development site there are several facilities which are responsible for emissions to air, including Centrica KPS Ltd, Hook2sisters Ltd, Corus UK, Ltd, px Biodiesel Immingham Ltd, E.ON UK Plc, Anthony Dawson Ltd, Total UK Ltd, Immingham CHP LLP, ConocoPhillips Ltd, Coal Products Ltd, PB Kent and Co Ltd,

Knauf UK GmbH, Cray Valley Ltd, NPower Cogen Ltd and Millennium Inorganic Chemicals Ltd.

6.8.23 The Updating and Screening Assessment (2009) for North East Lincolnshire Council indicates that shipping emissions from the operation of Immingham port were included in the Detailed Assessment of 2005, which led to the declaration of the Kings Road/Pelham Road AQMA for PM_{10}. The contribution of shipping emissions to local PM_{10} levels were approximately 7 percent.

6.8.24 The North Lincolnshire Air Quality, Updating and Screening Assessment (2006) is now out-dated and a full review of IPPC licences will be undertaken in order to determine which facilities, emitting to the air, will be examined within the air quality assessment.

Potential Impacts

Construction

6.8.25 There will be potential impacts on the local air quality due to construction activities and as a result of vehicle movements on-site and on the local road network.

6.8.26 It is expected that that construction phase will last for approximately 24 months and that they will be completed in 2014. There will be dust generated during the ground works stages of the construction phase. The removal of existing features will also give rise to dust. Piling will be used on-shore during the construction phase of the proposed development.

6.8.27 Due to the proximity of designated ecological sites a qualitative assessment of the potential impacts due to construction dust will be undertaken. Due to the distance between the proposed development and other sensitive receptors it is unlikely that the generation of dust will negatively impact on other receptors. It is assumed that standard construction industry good practice will be applied during the construction phase of the proposed development.

6.8.28 Construction traffic will potentially impact local air quality close to the routes to the proposed development site due to their exhaust emissions. Sensitive receptors along the access routes include residential properties and locations where there may be vulnerable occupants.

6.8.29 Criteria for assessing whether an assessment of the impacts of a road scheme on air quality are is required are stipulated in the Highways

Agency's Design Manual for Roads and Bridges (DMRB) Volume 11.3.1 (Air Quality), as follows:

- daily traffic flows change by 1,000 annual average daily traffic (AADT) or more
- heavy duty vehicle (HDV) flows change by 200 AADT or more
- a daily average speed change of 10 km/h or more
- a peak hour speed change of 20 km/h or more.

6.8.30 It is presently anticipated that there will be HGVs and LGVs travelling to the proposed development site each day. It is likely that the daily traffic flow could exceed 1,000 vehicle movements and therefore air quality screening calculations should be undertaken to determine the impact on local air quality within the EIA.

6.8.31 Materials for the construction of the proposed development will be delivered to the site by road, rail and sea. Following the outcome of the traffic assessment the approach to assessing the impacts on air quality during construction will be determined in consultation with the local authority.

Operation

6.8.32 The proposed development will include a biomass plant with a net power output of 299 MW, fuelled by clean woodchips and wood pellets. At base load operation, the biomass plant will operate on a continuous basis for 8,760 hours per year, or up to 8,500 hours at maximum continuous rating. It is estimated that there will be 5 start ups per year, using light fuel oil.

6.8.33 It is expected that the main air quality impacts of the proposed development during operation will be associated with the biomass facility and the emissions to air from the main stack. The *Technical Guidance Note D1* will be applied in determining the optimum stack height for the biomass plant.

6.8.34 The Large Combustion Plant Directive (2001/80/EC) and the Environment Agency's *Sector Guidance for Combustion Activities* set the limits on emissions of certain pollutants in the air and the EIA will assess the impact of the biomass plant on these levels. The UK Air Quality Strategy also establishes objectives for certain pollutants which the EIA of the proposed development must consider. Due to the size of

the biomass plant a detailed dispersion modelling study of the stack emission will be conducted as part of the EIA.

6.8.35 The EIA will not include an assessment of the emissions from the start up periods due to the fact that this process will only last a few hours and is considered to have negligible impacts compared with the main stack emissions.

6.8.36 The biomass facility will use approximately 2 million tonnes of fuel each year. The fuel will be delivered to the site via the proposed quay and transferred to the on-site storage via an enclosed conveyor system. The potential for impacts of dust during the operational phase due to the transfer of woodchips and wood pellets from the vessels to the storage facilities is considered to be negligible and is therefore not considered in the EIA.

6.8.37 Enclosed silos with fitted filter bags will be erected to store fly ash produced by the biomass plant. Due to the fact that fly ash silos with filter bags are an accepted and proven means of dealing with fly ash and the potential for fugitive emissions of dust is minimal it is determined that no further assessment is required.

6.8.38 During the operational phase of the proposed development the number of vehicles travelling to the site may be lower than the amount during the construction phase. The DMRB criteria for affected roads may, therefore, not be met for the operational phase. This will be corroborated by the traffic assessment.

6.8.39 Due to the fact that the fuel for the biomass plant will be delivered to the site via the new quay there may also be impacts on the local air quality due to emissions from shipping. DEFRA Local Air Quality Management Technical Guidance stipulates that the assessment of air quality effects from shipping does not need to be assessed where there are less than 5,000 shipping movements per year.

Proposed Assessment Methodology

6.8.40 The air quality impact assessment will allow baseline air quality levels to be identified, informing dispersion modelling to predict the likely effects of emissions associated with the development on air quality, and to enable optimisation of stack height to avoid any significant impacts.

6.8.41 Data on existing air quality and atmospheric pollutants will be assessed as part of the EIA to determine what the potential impact of the

proposed plant operation will be, and how this may impact upon human health in the nearby settlements.

6.8.42 The air quality assessment will be carried out in accordance with the Environment Agency's *Air dispersion modelling report requirements for detailed air dispersion modelling* and will include a review of ambient air quality and a detailed atmospheric dispersion modelling study.

6.8.43 As mentioned previously, the baseline conditions will be established, to include a review of the location and nature of existing local sources of emissions in the development site area, and the location of sensitive receptors. These existing conditions will be determined by carrying out a review of all available data. Data sources will include the local authority's air quality monitoring data and Air Quality Review and Assessment studies. It is not considered that specific air quality monitoring at the site will be needed as part of the assessment.

Construction

6.8.44 During construction the impacts are likely to be limited to impacts from dust from construction activity and emissions from construction traffic. Impacts from dust will be assessed qualitatively through a risk evaluation matrix. The impact of emissions from the exhausts of the construction traffic to air quality along roadsides near the site will be addressed using the DMRB screening methodology for the assessment of the impact on air quality of road traffic and included local traffic data and background air quality data. This method provides a robust estimate of ground level concentrations for direct comparison and evaluation with respect to the standards included in the Air Quality Standards Regulations 2007.

Operation

6.8.45 The air quality impact assessment from the operation of the facility will be limited to direct emissions from the biomass plant.

6.8.46 Operational emissions from the proposed main stack and auxiliary boiler have the potential to cause an impact to air quality. Impacts from the auxiliary boiler are expected to be confirmed as insignificant using the Environment Agency's *H1 screening methodology* (2003), while impacts from the main stack will be assessed through detailed dispersion modelling.

6.8.47 The atmospheric dispersion modelling study of operational emissions will be carried out using the United Kingdom *Atmospheric Dispersion*

Modelling System, Version 4.0 (ADMS), enabling stack height optimisation and determination of the predicted process contribution of substances released from the Plant as emissions. The optimal stack height will be determined for a variety of defined operational scenarios, considering both full-load and typical part-load operation, based on the resultant maximum short-term and long-term ground level air quality predicted during these operational scenarios. The optimal stack height will ensure that incremental ground level concentrations will be less than 1 percent of the relevant EALs (Environmental Assessment Levels) and therefore will be considered insignificant.

6.8.48 If relevant to the assessment, terrain and coastal influences will be incorporated within the study, in addition to the structural influences of the buildings within the proposed development.

6.8.49 The surrounding area and land use will be evaluated with respect to the sensitivity of receptors, and will include businesses and residences. The extent and density of the receptor grid will be optimised and agreed with the local authority.

6.8.50 ADMS is a computer-based model of dispersion in the atmosphere of passive, buoyant, or slightly dense, continuous or finite duration releases from single or multiple sources (including point, area or line sources). It uses an up-to-date parameter definition of boundary layer structure based on the Monin-Obukhov length and the boundary layer height. The model incorporates a number of complex modules, allowing for the effects of plume rise, complex terrain, buildings and coastlines to be accounted for when making predictions, and it is a model which is widely used by industry and regulatory authorities including the Environment Agency.

6.8.51 As recommended in the Environment Agency guidance, it is proposed that five years' sequential meteorological data from the most representative meteorological monitoring station will be used (and longer, where this is available). Meteorological data from the Humberside Airport Meteorological Monitoring Station will be used to generate worst case results.

6.8.52 A sensitivity analysis will also be undertaken using data from neighbouring stations for some of the overlapping years.

6.8.53 During modelling, direct comparison will be made between the predicted environmental concentration, of background levels plus long-term and short-term process contribution from the biomass facility and

the limits and objectives within the relevant Air Quality Regulations. The potential for fugitive emissions will also be assessed, as will dust emissions during the construction phase. Abatement of emissions to air will be discussed in relation to relevant standards, in terms of the severity of impact and frequency of emission.

6.8.54 Objectives for the protection of vegetation and ecosystems are detailed in the National Air Quality Strategy. Background air quality concentrations will be determined from the mapping of pollutants on the National Air Quality Information Archive. These background concentrations will be combined with the predicted incremental concentration at each of the sensitive sites to estimate the impact upon the vegetation and ecosystems in the surrounding area.

6.8.55 The global warming potential posed by these emissions will also be quantified using the Environment Agency's H1 methodology. It is proposed that a simple carbon balance assessment be undertaken for the operation of the plant. This will include inputs from the manufacture and transport of fuel, direct emissions from the plant, avoided emissions, the generation of electricity and will also consider any electricity that is offset.

6.9 LIGHT

Introduction

6.9.1 This section addresses the issue of light and details the proposed approach to assessing the impacts of the proposed development on sensitive light receptors.

Baseline Conditions and Sensitivities

6.9.2 Due to the fact that the area is heavily industrialised there are existing impacts as a result of lighting in the vicinity of the proposed development. In order to determine the existing level of lighting at the proposed development site a baseline light assessment will be undertaken to measure the Lux levels at various locations surrounding the site. The locations would coincide with sensitive receptors both human and ecological. Locations would be representative and a single reading may be taken to represent several nearby receptors. The location of these readings will be determined in consultation with North Lincolnshire Council. Light will be measured at locations within 1 km of the proposed development site boundary. This distance would not preclude the assessment of light impacts on sensitive receptors

further afield and these limits will be defined in the relevant ecological and landscape and visual chapters.

6.9.3 The light baseline study will also record the existing sources of light in the study area and their characteristics. It would identify if these existing sources are already obtrusive.

Potential Impacts

6.9.4 Although the closest communities are over 2 km from the proposed site, it is possible that certain human receptors will be sensitive to increases in light levels at the site due to the presence of three isolated dwellings close to the site boundary. Obtrusive lighting installations can have a negative impact on the appearance of the night sky and can lead to complaints from adjacent sensitive receptors, such as residents and recreational users. It is also likely that ecological receptors in the vicinity of the proposed development site are sensitive to lighting and the findings of this assessment will be used to inform the ecology and nature conservation assessments. There are various sources of lighting which may impact on nearby sensitive receptors:

- security lighting
- operational lighting
- car park lighting
- lights from within buildings
- road/junction lighting
- light from vehicle headlights

6.9.5 There are five potential effects associated with obtrusive light - sky glow, light presence, glare, intrusion and flicker (the last of these is addressed in *Section 6.18*, below).

6.9.6 *Sky glow* refers to sky luminance and site aura, which are large scale effects associated with direct and indirect light sources interacting with the atmosphere. They usually arise from large towns and cities and brightly lit installations.

6.9.7 *Light presence* arises when there is a leakage of light from a light source or that projected onto an area or building. The light which can be viewed causes minimal visual discomfort but fails to reach an intrusive level. This light presence may draw attention to a structure that was previously inconspicuous by day.

6.9.8 *Glare* is perhaps the most serious form of obtrusive light and cause a general visual discomfort. The impact of glare is dependant upon the

quantities and directional nature of the glare source, the physiological status and age of the person affected, the general nature of the area in which the effect occurs and the surrounding ambient lighting.

6.9.9 *Intrusion* is light trespassing into an area beyond the intended illuminated subject areas, such as into adjacent residential properties. Light intrusion may be the result of a single source or multiple light sources acting together, none of which need be a source of glare. The same measured value of light intrusion is likely to be less of a problem in a well lit urban area than in a previously unlit rural situation.

Assessment Methodology

6.9.10 Information will be collected from Able with regard to likely lux levels arising from the scheme. If detailed information is not available, assumptions will be made with regard to typical levels arising from car parks, security lighting etc.

6.9.11 The predicted lux levels which are stationary will be shown graphically using GIS and will illustrate how levels decrease from their source in accordance with the Inverse Square Law. Existing light sources will be included in order to identify areas where the greatest light accumulation is predicted to occur.

6.9.12 Light impacts arising from construction activities will also be addressed.

6.9.13 This information will be used to determine the significance of the impacts in terms of each of the potential effects identified above. It will also be used by the relevant specialists, such as the ecologists and landscape architects, to predict the significance of impacts on ecology and humans arising from the lighting of the proposed development.

6.9.14 A night time photomontage will be prepared to show how the proposed development affects lighting in the vicinity of the proposed development.

6.10 GEOLOGY & GROUND CONDITIONS

Introduction

6.10.1 This section addresses the issue of geology and ground conditions and details the approach to assessing the impacts of the proposed development on geology and ground conditions.

Baseline Conditions and Sensitivities

General Site Description

6.10.2 The proposed project site is predominantly flat and low-lying, with the southern half of the area used currently as agricultural land, and the northern half as hard standing for vehicle storage. A railway line runs north-south through the centre of the site.

Historic Site Land Use

6.10.3 The site has predominantly been used in the past as agricultural land, and there is relatively little historical industrial use on the site itself, although the area surrounding it has been extensively industrialised. There are no known active or historic landfills on site. Known previous activities within the site are (dates approximate, based on historical mapping) are as follows:

- 1908: flood defence embankment constructed along riverbank.
- 1931: railway is constructed running north-south through the site, with associated access roads from Killinghome station in the centre of the site to the lighthouses in the east and Rosper Road in the west.
- 1968: several drains crossing the site.
- 1971: flood defence wall constructed along riverbank.
- 1985: sewage works constructed on the western boundary adjacent to Rosper Road, and access road running east over the site, bridging the railway.
- 2003: part of northern area of site used for car storage.
- 2006: pylons crossing north west of site.
- 2007: larger part of northern area (approx half the site) now used for car storage.

Surrounding Land Uses

6.10.4 The western boundary of the site is defined by Rosper Road which provides direct access to the A160. Beyond Rosper Road lies the Total Oil Refinery and Conoco Philips Refinery and Combined Heat and Power (CHP) Plant. The eastern boundary of the site is marked by the existing flood defence wall beyond which lies the Humber Estuary. To

the north lies Humber Sea Terminal (HST), and to the south the Killinghome Oil Jetty and ABP Immingham Port. Notable historical developments in the area immediately surrounding the site include:

- 1886: Brick and tile works established adjacent to northern boundary, lighthouses constructed adjacent to southern boundary.
- 1892: Jetties extended from works and lighthouses.
- 1908/10: Brick and tile works expands and opens clay pit.
- 1931: Brick and tile works closed, railway constructed 600 m south of southern boundary, further jetties constructed and fish meal works established south of lighthouses.
- 1968: Brick/tile works and clay pit now shown as ponds and marsh area, works with chimneys and tanks adjacent to northern and southern boundaries.
- 1973: Gas works constructed 250 m north of northern boundary.
- 1974: Oil refinery 450 m west of western boundary, tanks at south eastern boundary shown as oil storage depot.

Geology

6.10.5 The site is overlain by approximately 0.4 m of topsoil and made ground (the made ground covering approximately 20 percent of the site, and being found in the immediate vicinity of the railway and around the north eastern boundary). Marine and estuarine deposits underlie the majority of the site except the western edge, which is underlain by glacial till. A localised area of glacial sand and gravel is shown in the south of the site.

6.10.6 Beneath these are layers of clay-silt alluvial deposits and boulder clay glacial deposits with some sand. The solid bedrock is between 14-18m below ground level across the site, approximately 90 percent Burnham Chalk (majority of terrestrial site area) and 10 percent Flamborough Chalk (quay area).

Hydrogeology

6.10.7 The site is not within any Source Protection Zone (SPZ); however, the western half of the site is a Nitrate Vulnerable Zone. The nearest

groundwater abstraction is approximately 300 m north west of the site. There have been no recorded pollution incidents on site.

6.10.8 The shallow alluvial deposits are classified as low permeability and non-water bearing; the deeper glacial deposits are capable of supporting water supplies at a local rather than strategic scale, although may contribute baseflow into the River Humber; and the chalk bedrock is a principal aquifer.

6.10.9 Much of the surface layer, notably the marine and estuarine deposits in the eastern half of the site, has high leachability potential, meaning any pollutants could quickly and easily reach underlying groundwater, however this risk is reduced in the western part of the site due to the cohesive glacial till, which would block the downward pathway of most pollutants.

Potential Impacts

6.10.10 It is not anticipated that contaminated land is likely to present a significant source of potential impacts, since the majority of the site has historically only ever been used as agricultural land, and the areas that have been industrially developed are either small and defined (in the case of the railway) or very recent and low risk (eg vehicle storage on hard standing). This recent change in land use and the presence of the railway in the centre of the site is likely to represent the greatest, albeit slight, potential for contamination.

6.10.11 The main potential sources of pollutants are likely to rise from the railway (ash, hydrocarbons etc) and the made ground and in the north east of the site. If hydrocarbons were encountered they would pose a threat to the controlled waters of the Humber estuary but leaching into the major chalk aquifer below the site would be less likely due to the thickness of cohesive glacial deposits overlying the chalk.

6.10.12 With regard to potential impacts in the estuary, previous investigations have suggested that the river bed in the north east of the site is not underlain by cohesive glacial deposits. It is considered likely that the chalk is either exposed in the river bed, or a thin veneer of alluvial deposits is overlying the chalk bedrock. As the alluvial deposits are considered as minor aquifers it is likely that the saline estuarine waters are in contact with the major chalk aquifer. Possible future dredging in this area may expose the major aquifer to increased amounts of saline ingress.

Construction

6.10.13 Potential impacts during construction result from the change in contamination sources, receptors (construction workers and visitors) and pathways compared to the baseline. Construction of the proposed development could include the following potential activities which could influence contamination sources and pathways:

- Vegetation clearance, excavation and removal of the ground which would potentially remove contaminants (if present) but could also release and mobilise contaminants (if present) during the clearance/excavation process.

- Redistribution of the ground and contaminants (if present), which could increase the potential for leaching of contaminants from the ground to the controlled waters receptors or introduce contaminants into new areas of the development site and thus to additional receptors.

- Stockpiling of excavated material prior to either re-use or removal which could release contaminants (if present) in the stockpile by entrainment in surface water run-off and increased leaching to groundwater.

- Use of plant and equipment on the development site which could accidentally leak fuels and oils, and introduce contaminants into the ground.

- Storage of fuel and oils on the development site which could leak/spill and introduce contaminants into the ground.

- Importation and placement of fill which could include contaminants.

- Placement of clean fill, foundations and hard standing which would potentially act as pathway barriers to human receptors and reduce the potential for infiltration of rainfall and reduce leaching to the controlled waters receptors.

- Temporary dewatering of the excavations which could potentially alter the groundwater flow direction for a short time and draw groundwater and contaminants into the excavation.

- Installation of service trenches which can act as preferential pathways for migration of vapours and contaminants in groundwater.

Operation

6.10.14 Potential impacts during the operational phase of the project that may result from the change in contamination sources, receptors and pathways compared to the baseline could include:

- Changes to receptors which will now comprise site occupants/visitors.

- Storage and handling of materials on the development site which could leak/spill and introduce contaminants into the ground.

- Changes to contamination sources, which could include removal or volatilisation of contaminants (source removal) during construction.

- Installation of vapour membranes in infrastructure preventing accumulation of vapours and ground gas.

Proposed Assessment Methodology

6.10.15 The EIA will assess in detail the potential for contaminated land to occur on the site and, subsequently, the risks associated with any disturbance of contaminated land.

6.10.16 The process of contamination risk assessment that will be adopted during the EIA can be summarised as follows:

- Hazard identification (establishing contaminant sources) and hazard assessment (establishing pathways and receptors and identifying Potential Pollutant Linkages (PPLs)). Both the hazard identification and assessment stages conclude in the development of a Conceptual Site Model (CSM).

- Risk estimation which predicts the likelihood (probability assessment) and degree (consequence assessment) of harm/pollution occurring. Risk estimation has two components: firstly probability assessment which relates to whether pollution/harm will occur in the short- and/or long-term (risk estimation is only undertaken when a PPL exists); and secondly consequence assessment which is the magnitude of harm that would

occur (because of the PPL) taking into account the sensitivity of the receptor.

- Risk evaluation, which is the process of deciding whether a risk is acceptable or not and entails the application of evaluation criteria. These evaluation criteria are set in relation to a level of harm or pollution to the specific receptor. They may be absolute standards or recommended limit values, for example, a health criterion value for the intake of a substance.

6.10.17 The approach to the assessment will develop a CSM for each stage of the proposed development; this will identify potential receptors to existing land contamination that could be changed by the proposed development and carry out a contamination risk assessment for each.

6.10.18 The impact assessment will be carried out by comparing the construction phase CSM and risk assessment with the baseline. This CSM comparison approach allows the changes in land contamination status during the construction phase of the proposed development to be divided into major, moderate, minor or negligible impact (or change) which can be positive, neutral or negative. Determination of effect significance consists of comparing the magnitude of the hazard/source and sensitivity of the receptor for each potential impact.

6.10.19 It is recognised that consultation will be required with the Environment Agency during this aspect of the EIA. The proposed methodology will be discussed with the Agency in advance of the EIA and the subsequent findings of the study presented to the Agency in advance of finalising the EIA report.

6.11 MARINE ARCHAEOLOGY AND HERITAGE

Introduction

6.11.1 This section addresses the issue of marine archaeology and details the approach to assessing the impacts of the proposed development on marine archaeology.

Baseline Conditions and Sensitivities

Wrecks

6.11.2 In the River Humber there are records of three wrecked ships from the post-medieval to early modern period (c 17th to 19th centuries), the exact positions of which are unknown, but which have been variously

accorded locations off Killingholme (eg Whitebooth Roads, Holme Spit). These wooden vessels were lost in heavy storms in deep seas or on sand spits and are unlikely to have survived in any intact form given the circumstances in which they sank.

6.11.3 Five wrecks are recorded of vessels which foundered in the late 19th or 20th centuries on the stretch of the Humber opposite the study area. These range from fishing boats to cargo ships and barges. In most cases, the exact position of these wrecks is unknown, being accorded a general location only. In one case, however, the wreck of a barge is marked on the relevant Admiralty chart and was detected during the geophysical survey undertaken as part of the current development proposal. The recorded location of this wreck places it very close to the area where the new quay is to be constructed, and it is possible it could be disturbed during any associated dredging works.

Aircraft

6.11.4 During World War II many British and German aircraft were lost in the Humber area either through hostile action or accident; although none are currently known to lie within study area, the discovery of aircraft wreckage in the intertidal zone or in deeper water is a possibility.

Palaeo-Coastline

6.11.5 It is apparent from consideration of the distribution of archaeological sites in the study area that, other than a few isolated finds of material recovered from fieldwalking, evidence of significant prehistoric and Romano-British settlement is restricted to areas away from the estuarine alluvium which occupies a 1-2km wide strip along the coast. In the north eastern part of the study area, Iron Age settlement remains were shown to be present beneath a thick layer of alluvial clay, while a possible contemporary coastline, fringed by creeks and channels, was detected beneath the alluvium, 50-100 m east of its western edge.

6.11.6 Trial excavations further south (at the vehicle storage facility) also recorded alluvial layers which were deeper further to the east, suggesting a buried coastline contemporary with later prehistoric activity. If this trend continues across the study area (and there is no reason to suppose otherwise) it would suggest that there is very little likelihood that later prehistoric settlement remains will extend as far eastwards as the present coastline.

6.11.7 Evidence from sites elsewhere on the Lincolnshire Marsh, however, has shown that the alluvium seals horizons associated with earlier phases of human activity, potentially ranging in date from the Mesolithic

through to the Bronze Age. In some cases these will potentially extend beyond the modern shoreline, though they will have been eroded increasingly severely the further out from the shore they extend; within the deposits may, however, survive the remains of timber structures or other features, artefacts and animal remains. Where present, these remains will generally be of Local/Regional Importance whilst prehistoric boat remains or intact Mesolithic occupation sites would be rated higher (potentially National or Regional Importance).

Potential Impacts

6.11.8 The quay and its supporting structures could potentially affect below-ground archaeological remains where any are present. Archaeological remains identified or potentially surviving within the proposal area are expected to lie beneath estuarine alluvium, with erosion having damaged them increasingly severely the further out from the shore they extend.

6.11.9 Construction of the quay will involve piling – as such it has the potential to affect relatively small areas of below-ground archaeological deposits where such survive, they are considered to be of Low or Medium Impact.

Proposed Assessment Methodology

6.11.10 The EIA will examine the potential for marine archaeology and cultural heritage to occur in and around the proposed development site in more detail. The principal objectives of the assessment will be as follows:

- to identify known archaeological sites within or immediately adjacent to the proposal site;
- to identify areas with the potential to contain any unrecorded archaeological remains;
- to assess the effects of any proposed development upon archaeological sites; and
- to propose archaeological measures which could be built into the development proposals to avoid, reduce or remedy any potential adverse effects identified.

6.11.11 The EIA will take account of the *Department of Communities and Local Government Planning Policy Statement 5 (PPS5) Planning for the Historic Environment*, issued in March 2010, which sets out the national policy

on archaeological remains, how they should be preserved or recorded (policy HE7); this applies to both designated (paras HE9.1 to HE9.4) and non-designated sites (paras HE9.5 and HE9.6).

6.11.12 Where archaeological remains can be demonstrated through research and/or evaluation, a mitigation strategy should be prepared in consultation with the Local Planning Authority. The presumption is in favour of preservation in situ through the modification of a proposed development, and only where this is not possible, an appropriate level of recording ("preservation by record") is acceptable as a last resort.

6.11.13 As part of the assessment proposed in the EIA, consultation will be undertaken with relevant archaeology and cultural heritage organisations such as English Heritage to ensure that the assessment methodology and findings are discussed prior to presentation in the ES.

6.12 TERRESTRIAL ARCHAEOLOGY AND HERITAGE

Introduction

6.12.1 This section addresses the issue of terrestrial archaeology and details the approach to assessing the impacts of the proposed development on terrestrial archaeological resources.

Baseline Conditions and Sensitivities

Area and Site Overview

6.12.2 No sites of national importance (equivalent to Scheduled Monuments and Grade I or II* Listed Buildings) have been identified within the study area, although a significant number of sites of regional or regional/local importance are known to exist, varying from Grade II listed buildings (three lighthouses outside the south eastern boundary) through to Iron Age and Romano-British settlement sites. The nearest scheduled monuments are medieval moated sites, approximately 1.5 km to the north at North Killingholme and East Halton. The site is not in or near an archaeological conservation area or other designated area.

6.12.3 Within the site area itself, no sites have been identified, although the expectation is that other sites of Local or Regional importance which have not yet been identified will potentially be present.

Iron Age

6.12.4 Iron Age settlement remains have been recorded during some of the many recent episodes of archaeological fieldwork which have preceded development in the Killingholme area, much of it taking place inside the study area or close to it.

6.12.5 Parts of two Iron Age enclosures were excavated during archaeological evaluation and mitigation works preceding construction of the Able UK vehicle storage facility, which is in the north of the development site area. The enclosures had wide enclosure ditches being recorded on all sides and traces of roundhouses and other structural features being located in the interior. Pottery recovered suggested occupation in the Middle Iron Age through to early Romano-British period. The settlements would have lain on either side of a narrow coastal creek or inlet, the line of the coast, a short distance to the east, having been established through geophysical survey and trial trenching. The site itself was sealed beneath a thick layer of alluvium, the result of later tidal transgression.

6.12.6 To the west of the study area, further evidence of Iron Age settlement has been recorded. The site of the Immingham CHP plant and the Clough Road re-alignment works both recorded significant structural remains, including roundhouses, while a 400m-long Iron Age boundary ditch was recorded during trial excavations prior to construction of works associated with the Total oil refinery, running roughly parallel to Rosper Road.

6.12.7 Whilst none of these known sites will be disturbed (with the exception of the vehicle storage area, which was disturbed during construction), it is clear that deposits representing earlier landscapes ranging in date from the Mesolithic to the Iron Age will survive in places beneath the estuarine alluvium, and there is therefore potential for further similar sites to be found throughout the site area.

Romano-British

6.12.8 Excavations in advance of the Clough Road re-alignment, and subsequent work connected with the Able UK vehicle storage facility, recorded several phases of activity, principally a series of field or boundary ditches on two alignments associated with Roman pottery dating from the 2nd century to the 4th century AD. No traces of buildings were recorded, though carbonised grain in one part of the site suggests at least some human activity.

6.12.9 Further north, on the edge of the study area, Romano-British finds and some structural traces were recorded during construction of a gas plant in the 1960s. The Iron Age settlement described above under the vehicle storage area continued in use into the Roman period, with at least one ditch containing Romano-British pottery being located in the area to the east of the Iron Age enclosure. Occupation of the Iron Age site beneath the Immingham CHP plant mentioned above also continued into the Roman period. A number of finds, principally of Romano-British pottery, have also been made within the areas now occupied by oil refineries and these concentrations of finds suggest that Roman settlement was relatively intensive in this area.

6.12.10 The areas nearer the present-day coastline would have been more marginal during this period due to the streams and creeks crossing the area, and would probably have been saltmarsh. As a result of this, the likelihood of finding significant structures from this period is low.

Anglo-Saxon and Early Medieval

6.12.11 In common with the Roman period, environmental conditions prevented any significant settlement along the immediate coastal strip, and development remained slightly further inland, with the coastal area used for seasonal grazing. There are no discoveries of Anglo-Saxon or early medieval date in the study area, although an 8th-century coin was recovered from the upper fills of one of the former droveway ditches on the Iron Age and Romano-British settlement excavated beneath the Immingham CHP Plant. The Humber would have been a main trading artery for bringing imported goods from the Continent into northern England, with a number of havens along its edges acting as landing areas; there is a possibility that the creeks along the coast in the survey area may have been used for this purpose.

Post-Medieval and Early Modern

6.12.12 Enclosure by Act of Parliament in the 17th to the 19th century saw the open fields and common lands of English medieval villages being enclosed and allocated to a number of private landholders, removing the rights that people once held to graze animals on these areas. North and South Killingholme were enclosed in 1776, and therefore around this time it is likely that the coastal land of the development site would have been drained to provide higher grade agricultural land.

6.12.13 A small number of buildings of post-medieval or early modern date are known to exist in the area, including farm buildings. The most significant buildings of this date in the Study Area, however, are the three lighthouses in South Killingholme, constructed in the early-mid

19th century and which played a crucial role in the navigation of shipping into the Humber; all three are Grade II listed buildings.

Modern

6.12.14 The 20th century saw extensive industrial development of the area surrounding the site, transforming a large area of former marshland and low-grade farmland. A number of railways were opened in the early years of the 20th century to service the docks and provide transport for goods and passengers between and beyond the various dock facilities at Immingham and Grimsby. The docks and industry were targets during World Wars I and II and therefore various military installations were built, however all of these were off the development site, and the majority have since been demolished.

Potential Impacts

6.12.15 The formation of associated temporary works compounds, lay-down areas or crane hard standings on the adjacent land could potentially involve some below-ground disturbance to archaeological remains, though given the depth of alluvium known to overlie archaeologically-significant deposits, this is considered to be of Low Impact.

6.12.16 Trenches excavated for mains services, particularly drainage or sewerage, have the potential to be amongst the deepest ground works; there is some potential, therefore, for this activity to disturb surviving archaeological deposits. These are generally of limited extent, however, and are considered to have a Low Impact.

6.12.17 The assessment of known and potential archaeological sites discussed above suggests that the proposal might contain archaeological sites of Local/Regional importance. Therefore any of the below-ground construction works associated with the proposed development, likely to be effects of Low or Medium magnitude, would potentially affect such sites to Minor or Moderate adverse significance.

Proposed Assessment Methodology

6.12.18 The proposed approach to the assessment of terrestrial archaeology in the EIA will be broadly similar to that explained for marine archaeology above.

6.12.19 However, in addition, the assessment of terrestrial archaeology will take account of trenching and geophysical ground investigations which will be carried out as part of the EIA study to examine ground conditions. These investigations will identify the presence of any

features or artefacts of archaeological interest and will compliment desk based studies aimed at establishing the baseline of archaeological interest on site.

6.13 COMMERCIAL & RECREATIONAL NAVIGATION

Introduction

6.13.1 This section addresses the issue of commercial and recreational navigation and details the approach to assessing the impacts of the proposed development on commercial and recreational navigation.

Baseline Conditions and Sensitivities

6.13.2 The Humber estuary is one of the busiest estuaries in the UK in terms of shipping traffic with approximately 40,000 vessel movements per year. Traffic on the River Humber totalled 89 million tonnes in 2005. The leading ports by tonnage were Grimsby and Immingham (68 percent), Hull (15 percent) and wharves on the Rivers Hull and Humber (11 percent). Almost a quarter of the UK's seaborne trade passes through the Humber.

6.13.3 As the Harbour and Pilotage Authority, Associated British Ports (ABP) manages the navigational safety of the Humber Estuary, Rivers Ouse, Trent and the Humber.

6.13.4 The navigational channels in the estuary are maintained by dredging, which takes place at a number of sites and is affected by natural cycles in sediment deposition. ABP undertake maintenance dredging of the Sunk Dredged Channel on a regular basis, and also survey the river, mark the main channels with buoys, and disseminate information on the river to users. Dredged material is disposed of at various points along the river under a range of permits.

6.13.5 Shipping movements in the Estuary are controlled through Vessel Traffic Services (VTS) Humber, an operational centre run by ABP which directs the movement of ships within a harbour area, through use of radar and VHF radio.

6.13.6 Humber Sea Terminal (HST) carries out the import, export and transportation of unitised, bulk and general cargoes from six Roll on/Roll off berths at North Killingholme Haven, adjacent to the northern boundary side of the site. Immediately to the south of the site is South Killingholme Jetty (a single berth facility handling LPG and other petroleum products on vessels up to 60,000 tonnes).

6.13.7 The development of the Project will have an impact in terms of increasing the volume of shipping in the estuary, during both the construction phase and longer term during the operation of the facility. The EIA will therefore be required to assess the increase in shipping associated with the Project, and extensive consultation with ABP as the statutory harbour authority will be required, as well as HST as an important adjacent port operator.

Potential Impacts

6.13.8 The removal of dredged material from the river and placement of the new quay may alter the hydrodynamic regime of the river, and potentially affect the movement of sediment in other dredged channels and berths (including potential cumulative impacts with other proposed developments). This could impact the existing navigational channels in the estuary and alter the current regime with regard to maintenance dredging and channel depths.

6.13.9 In addition, the close proximity of the new quay to existing berths at Humber Sea Terminal and South Killingholme Jetty may present additional navigational challenges and safety risks for vessel using all these facilities, during both construction of the new quay and its ongoing operation and use.

6.13.10 The potential depth to which the approach channel could require to be dredged (approximately 11 metres) will probably mean that ongoing maintenance dredging may be required on a significantly larger scale than is currently the case. This could impact the hydrodynamic and sedimentary regime in the estuary, and in addition may have an ongoing cost aspect that will need to discussed and agreed with ABP.

6.13.11 In addition, it is thought that there may be potential health and safety implications arising from the operation of a helipad as part of the proposed development, with aircraft taking off and landing in close proximity to vessels, and the high risk cargo (LPG and other petroleum products) handled at the South Killingholme Jetty.

Proposed Assessment Methodology

6.13.12 The EIA will assess the potential impacts of the proposed development on navigational and shipping in the Humber estuary through adopting the methodology summarised below.

- The impacts of the project on the hydrodynamic and sedimentary regime in the estuary will be assessed using a computer modelling system, as explained in *Section 6.2*. The findings of this modelling

study will be used to inform the assessment of impacts on navigational channels (depths, widths, etc) and the current maintenance dredging regime in the estuary and whether any significant changes are likely to occur to these factors as a result of the project. Once these impacts are understood discussions with ABP will be held to ensure that all appropriate mitigation measures are adopted to ensure that navigational channels in the estuary are suitably maintained.

- To assess any impacts on navigational safety that may result from the increase in vessel traffic in the estuary from the project a specific navigational/vessel traffic risk assessment study will be carried out as part of the EIA. This study will examine the risks associated with increased vessel traffic and how those risks can best be managed. The findings of this study will be discussed and agreed with ABP and Humber Sea Terminal (HST), as adjacent port operators to ensure that all appropriate navigational safety mitigation measures are incorporated. The EIA will present the findings of the navigational risk assessment and the outcomes of consultation with ABP and HST on these issues.

6.13.13 In addition to consultation with ABP and HST, discussions on navigational issues will be held with recreational sailing and yachting groups in the estuary and any other appropriate stakeholders that may be identified during the EIA process.

6.14 TRAFFIC AND TRANSPORT

Introduction

6.14.1 This section addresses the issue of landside traffic and details the proposed approach to assessing the impacts of the proposed development arising from changes in traffic.

Baseline Conditions and Sensitivities

Roads

6.14.2 Road access to the site will be from Rosper Road (an unclassified single carriageway), which runs north-south along the western boundary of the site. Some 10 km west, the A180(T) ends at the M180, which then offers connection to the nationwide motorway network. The surrounding area has already been subject to significant industrial development, and in general the local road network is well designed to

handle HGVs. Descriptions of the key road junctions along this route are provided below.

A160/Rosper Road Priority Junction

6.14.3 This is a priority junction on the A160 towards Immingham West Docks. The minor road is Rosper Road that leads north towards the site. Although the national speed limit applies to all arms, the high numbers of HGVs that use the A160 towards the docks significantly reduce vehicle speeds. Visibility on the western approach is limited by a railway bridge that carries freight directly into the docks.

A180(T)/A160(T) Merge/Diverge

6.14.4 This is a grade separated junction where the A160 (T) meets with the A180 (T). The national speed limit applies to both roads. The A180(T) is a dual carriageway, two-lane all purpose road with grade separated junctions along its length.

Road Safety

6.14.5 Data available for this Scoping Report for the period 2002-2006 recorded the following Road Traffic Collisions on roads near the site:

- A160/Rosper Road Priority Junction - 3 slight accidents.
- A180(T)/A160(T) Merge/Diverge – 4 slight accidents.

Public Transport

6.14.6 There are limited public transport connections nearby. The closest bus stops to the site are located in East Halton, serviced by routes to Grimsby, with additional stops in South Killingholme serving routes to Grimsby and also Barton upon Humber. Some of these routes do not operate every day of the week and those that do have low frequency, so are unlikely to offer workers any realistic options to commute to work by bus.

6.14.7 The nearest train station is Habrough (approx 5.6 km south west of the site) which is served eight times a day during the week by a service which runs between Cleethorpes and Manchester Airport, eight times a day during the week by a service which runs between Cleethorpes and Barnetby, and once a day during the week by a service which runs between Cleethorpes and Sheffield. These routes make train/cycle journeys to work a viable option albeit that only a very small number of employees are likely to find this option attractive.

Potential Impacts

Construction

6.14.8 A section of the route from the A180 to the proposed development uses the A160 which passes close to South Killingholme. The A160 is a main road and is suitable for large construction vehicles. The likelihood of large vehicles travelling through sensitive receptors such as residential areas is low. However, depending on the origins of materials and contractors, vehicle routeing through residential areas may be unavoidable, in which case appropriate mitigation would be suggested to minimise any impact. Due to the location of the site in an industrialised area, and the proximity to large trunk roads, the likelihood of large vehicles travelling through sensitive receptors such as residential areas is low.

6.14.9 There are potential cumulative impacts which may occur as a result of traffic generated by the Able development construction using routes which already have numbers of HGVs travelling to and from the adjacent ports and industrial areas. Consideration will also be given to the schedules of sailings of cargo vessels/ferries in relation to expected construction schedules although many sailings are tide dependent and therefore vary on a daily basis.

6.14.10 There is a potential impact arising from increased interaction with the railway passing through the site if level crossings have to be established during construction to allow vehicle movements around the site.

Operation

6.14.11 It is intended that the majority of materials will arrive and leave the site by ship or rail, and therefore operational HGV movements on the roads, particularly abnormal loads, will be reduced to the minimum possible.

6.14.12 The majority of operational road traffic is therefore expected to comprise workers travelling to and from the site.

Proposed Assessment Methodology

Construction

6.14.13 A key stage in the impact assessment will be to further inform the baseline by collecting up to date traffic data for the key routes likely to be affected by construction and operation traffic.

6.14.14 The anticipated number of workers active on-site at any one time will be identified to provide a profile of staff numbers over the construction period. Further information will be sought on the likely mix of contractors and local workforce which will aid in assuming modal split.

6.14.15 A likely traffic distribution will then be developed based on further information that is available, but also taking account of potential mitigation measures. Information on the number of deliveries by HGVs over the construction period will be included in the assessment.

6.14.16 The impacts of the increased number of trips will be assessed at key road junctions for the peak period of construction activity. The majority of abnormal loads are not expected to arrive by road. However, if proposals change then swept path analysis will be used to confirm the suitability of the proposed route to accommodate the anticipated vehicle type.

6.14.17 The assessment will examine the impact of the proposed development in terms of the magnitude of change in existing am and pm peak hour traffic flows as a result of total generated traffic. The change will be presented as a percentage. If generated HGVs and personnel traffic are likely to travel during the peak hours these will be counted together.

6.14.18 The assessment will identify the magnitude of change in traffic flow as a result of the construction and operation of the proposed development. A change in excess of 10% (5% in sensitive locations) will be considered as significant, taking into account professional judgement (for construction, the length of likely disruption will also be considered). A Transport Assessment will be produced for the development and the scope of this assessment will be agreed with the local highways authority.

6.14.19 If, during construction and operation, any roads, footpaths, cycleways, bridleways etc are to be temporarily or permanently closed or diverted, these will be identified and the measures which will be put in place to minimise disruption to users identified in the assessment. This includes the possibility of temporary disturbance along the foreshore.

6.14.20 In addition to the above specifications, should operation or construction of the proposed development cause an increase in traffic flows of greater than 10% an assessment will be carried out of the associated noise and air quality impacts. If the assessment indicates that changes to traffic flows may have significant adverse impacts on highway safety or amenity, mitigation measures will be proposed.

Operation

6.14.21 The anticipated operational usage of the site in terms of personnel and the transportation of materials will be considered. The transportation of materials will be presented as annual movements by mode. First principle assumptions based on the operational characteristics of the site will then be used to profile the traffic to provide hourly HGV movements. HGV traffic will be assigned to the highway network in accordance with the origin/destinations and assumed routes. However, it is anticipated that the majority of HGVs will use the strategic road network via the Rosper Road/A160/A180 route. Similar first principle assumptions based on projected employee numbers, working hours and shift patterns will be used to derive employee trip movements and these will be assigned to the highway network.

6.14.22 Assessment years will be agreed with Local Planning Authority but in line with Department for Transport Guidance on Transport Assessments it is envisaged that this will be the opening year and 15 years after registration of the planning application for the strategic road network, which will be assessed using the anticipated increase in traffic flows.

6.15 SOCIO-ECONOMICS

Introduction

6.15.1 This section addresses the issue of socio-economics and details the proposed approach to assessing the impacts of the proposed development on employment and population etc. It includes a description of the baseline conditions, an identification of the potential impacts and the proposed assessment methodology to determine the significance of the impacts during both the construction and the operational phases of the proposed development.

Baseline Conditions and Sensitivities

6.15.2 The proposed development is located within a predominantly historically rural area in North Lincolnshire, although since the latter half of the 20th century there has been extensive industrial development along the banks of the Humber, comprising ports, various petro-chemical plants and power stations. The closest settlements to the site are the villages of East Halton and North Killingholme with populations in 2001 of 604 and 224, respectively.

6.15.3 The rate of unemployment in North Lincolnshire in 2007 was the same as the national average, at 5.4%. This is marginally below the regional value of 5.6%. By contrast the unemployment rate in North East Lincolnshire was 6.6% in 2001. The breakdown of employment status is shown in *Table 6.12*. This shows that a higher proportion of people work in routine and semi-routine occupations than the national average.

Table 6.12 Breakdown of the occupation/status of 16-74 year olds in North Lincolnshire

	Number	North Lincolnshire %	England and Wales %
All people 16-74	110,156		
Higher managerial occupations	2,618	2.4	3.4
Higher professional occupations	3,067	2.8	5
Lower managerial and professional occupations	16,641	15.1	18.6
Intermediate occupations	8,033	7.3	9.4
Small employers and account workers	6,713	6.1	7
Lower supervisory and technical occupations	11,496	10.4	7.2
Semi routine occupations	15,361	13.9	11.8
Routine occupations	15,601	14.2	9
Never worked	2,725	2.5	2.7
Long term unemployed	1,061	0.9	1
Full time students	5,170	4.7	7
Not classified for other reasons	21,670	19.7	17.9
Total	110,156	100	100

Source: Census 2001. http://www.northlincs.gov.uk/NorthLincs/CouncilandDemocracy/census/Census2001EmploymentAndQualifications.htm

6.15.4 The area around the site already has a large number of industrial developments, for example Humber Refinery, Lindsey refinery, Humber Sea Terminal (HST) and Immingham Port. The port facilities in the Humber region as a whole are of prime importance because of the wealth and employment they give and the attraction they provide for other industries to locate in the area.

6.15.5 The proposed development is in keeping with the existing industrial and economic sectors in the region and will further strengthen the capacity of the Humber to generate inward investment and therefore socioeconomic development. The proposed development will generate direct employment opportunities in the region and secondary benefits through procurement and investment.

Potential Impacts

6.15.6 The construction and operation of the Project could result in both positive and negative impacts, including:

- temporary employment associated with the construction programme;
- indirect and induced employment ie employment arising offsite in response to the demand generated by the proposed development in relation to construction materials and supplies and employment arising from employees' expenditure on local goods and services;
- inconvenience to local communities, including those associated with stress as a result of poor communication or consultation and/or stress associated with construction activities and interruption to the use of local amenities, which could affect for example leisure activities; and
- potential changes to land and property values.

6.15.7 In addition, the site's wind turbines, once operating, will be contributing towards the regional and national targets for the proportion of electricity which should be generated from renewable sources.

Proposed Assessment Methodology

6.15.8 A more detailed analysis of existing socio-economic conditions will be undertaken as part of the EIA to provide a benchmark against which potential impacts can been assessed. These conditions will include: key socio-economic indicators such as employment activity; structure of local industry; unemployment; employment opportunities and skills; population change; and age structure of the local population.

6.15.9 The analysis will also consider the local and regional policy context in terms of identifying key economic, social and regeneration priorities for the impact areas. This will include an outline of key policies which seek to enhance the role of sourcing energy from renewable resources in meeting economic and social objectives.

6.15.10 Establishing the baseline will primarily be a desk-top exercise, drawing on national, regional and local economic data and sources such as the Census, Office of National Statistics, Labour Force Survey and Indices of Deprivation, as well as publications from local and regional sources.

At this stage, it is anticipated that most of the information relating to the administrative area of North Lincolnshire Council and the surrounding areas will be provided through secondary sources including the websites of the local authorities.

6.15.11 The assessment of the socio economic impacts of the proposed development will include detailed consideration of:

- employment related impacts during both the construction and operation phases, considering both employment opportunities created and jobs safeguarded locally;
- indirect impacts on the local economy generated as a consequence of increased economic activity during the construction and operation phases; and
- the wider benefit of the proposed development through securing energy resources within the region.

6.15.12 The study will review the statistics in the following areas:

- the Primary Study Area, which contains the ward in which the site is located and in which socio-economic impacts will be accrued; and
- the Secondary Study Area, which covers the Local Authority area, in this case, the North Lincolnshire Council.

6.15.13 There are no recognised standards or guidelines for defining the socio-economic impacts. In order to assess the significance of impacts, statements can be used, against which a judgement on the degree of change can be assessed:

- *major* – intensive change to the local area, or noticeable change to extensive area e.g. due to change in expenditure or through job creation;
- *moderate* – clearly identifiable benefit or loss to the local economy over the long term;
- *minor* - slight or short term changes to local economy; and
- *negligible* – no identifiable effects.

6.15.14 The study will be carried out by a desk top study, reviewing key statistical information.

6.15.15 The assessment for the construction phase will focus on the number of direct and indirect jobs that are likely to be associated with the construction of the development. The assessment will also identify impacts of the proposed development on demand for local services and amenities, including any additional requirements for health and education services.

6.15.16 Direct impacts to people relating to increases in noise, traffic, congestion, dust, visual impact etc during the construction phase will be assessed as necessary in the relevant EIA chapters. However, the socio-economic assessment will consider the potential inconvenience and stress caused to communities as a result of these impacts.

6.16 LANDSCAPE & VISUAL

Introduction

6.16.1 This section addresses the issue of landscape and visual impacts and details the proposed approach to assessing the impacts of the proposed development on landscape and visual amenity.

Baseline Conditions and Sensitivities

6.16.2 The site is located on the south coast of the Humber estuary, surrounded by a predominantly rural landscape with localised industrial development in a strip along the river bank comprising ports, various petro-chemical plants and power stations. The site at present is largely undeveloped and comprises agricultural land, with a railway passing through the centre of the site and some development in the northern section consisting of a vehicle storage area.

6.16.3 The site is located in an industrial landscape within Natural England's Humber Estuary National Character Area. The Lincolnshire Wolds Area of Outstanding Natural Beauty is approximately 13 km to the south. A desk study has indicated that there are no statutory landscape designations applicable on the proposed development site.

6.16.4 The Humber Estuary Character Area is described as:

- Expansive, flat, low-lying, sometimes remote estuarine landscape dominated by the Humber and with an ever changing character due to tidal influences.

- Dominance of sky and open views over the estuary, mudflats and salt marshes, where flood embankments allow.

- A predominantly reclaimed former intertidal landscape of rectilinear fields with boundaries formed of dykes, drains and embankments.

- A landscape of predominantly arable farming with some conspicuous areas of market gardening, particularly around Hull.

- Internationally important coastal mudflats and other wetlands and coastal habitats, including the Spurn peninsula.

- Urban and industrial influences around Hull and on the south bank.

6.16.5 The topography is very flat within the estuary area, with minor variance created by flood defence features. There has been considerable industrial development along the western side of the Humber estuary close to the project site. The Immingham Dock site has oil and liquid chemical storage facilities, and a number of building and terminals that provide an industrial backdrop to the area. In particular the site, and the surrounding area is already extensively used for car storage and export and import, therefore vehicle movements around the site are a regular occurrence. Other existing industrial facilities include the nearby oil refineries, power stations, rail freight line and nearby docks, vessel movements and roads.

6.16.6 Vertical built structures such as church spires, pylons, cooling towers and stacks dominate the skyline. The Humber Bridge is also a dominant feature within the landscape. The presence of trees is limited to those located within the built up areas, private gardens and public open spaces, however there are some small patches of copse scattered through the area. The landscape adjacent to the built up areas is open, dominated by farmland and a strong linear pattern created by roads and drainage ditches.

6.16.7 Visibility within the study area varies. In some locations extensive panoramic views are achievable due to the flat and low lying nature of the topography, with vertical built features forming strong reference points in views and creating a varied skyline. Views down and across the estuary are also common, with long distance and panoramic views of the existing landscape experienced from points along the estuary edge. However, at a more local level the large-scale of the built structures and the industrial context, provide visual containment, restricting views in some instances.

6.16.8 The following viewpoints have been identified from Ordnance Survey mapping:

- Paull Point Battery (approx 6.5 km north)
- Victoria Pier, Hull (approx 11 km north west)
- Humber Bridge (approx 15 km north west)

6.16.9 In addition to those identified above, potential receptors may include residents of and visitors to the surrounding settlements.

Potential Impacts

Construction

6.16.10 Impacts on landscape elements during the construction phase are not anticipated to be significant; however, changes in patterns and structure of the landscape may occur as a result of the introduction of new temporary features. The plant and construction requirements are not fully known at this stage; however, temporary visual disturbance may occur as a result of the construction activities. This could include the presence of moving features such as plant and could result from increased illumination.

Operation

6.16.11 Even in a landscape which is industrialised with existing chimneys and other tall structures, the wind turbines proposed for the site are likely to have a significant visual impact and be visible from some distance due to the flat, open terrain. It is also likely that tall cranes will be based on site to assist in the assembly of the offshore wind turbines being manufactured. Therefore during the operational phase potential impacts may include:

- long-term changes in existing landscape structure and pattern though the addition of landscape elements, especially new vertical structures

- long-term changes in views achieved from receptor locations identified in the baseline

- long-term increased illumination and activity within the site.

Proposed Assessment Methodology

6.16.12 The assessment will be prepared in accordance with good practice, as described in the *Guidelines for Landscape and Visual Impact Assessment*

produced jointly by the Landscape Institute and the Institute of Environmental Management and Assessment. This assessment methodology is applicable to short and long term impacts.

6.16.13 The landscape and visual impact assessment will assess impacts which are temporary (during construction); permanent (ie permanent loss of vegetation or change in landscape elements); and operational (ie a consequence of lighting etc). Impacts which are short or long term and reversible or irreversible will be identified. Indication of the direction of the impacts, ie adverse (negative) or beneficial (positive), and any subjectivity associated with this will also be described. Consideration will be given to the way in which impacts will change with time, as any landscape planting proposed as part of the scheme grows and matures. Any temporary construction facilities will also be considered.

6.16.14 The broad objective in assessing the effects of the proposed development is to determine the predicted significant impacts of the development on the landscape resource and visual receptor. Impacts will be assessed as either significant or not significant, through a combination of two considerations: the sensitivity of the landscape element, landscape character receptor or view, and the magnitude of change that will result from the development.

6.17 AVIATION

Introduction

6.17.1 This section addresses the issue of aviation impacts and details the approach to assessing the impacts of the proposed development on aviation.

Baseline Conditions and Sensitivities

6.17.2 The proposed development is located in an airspace which is heavily trafficked. Humberside airport is located approximately 10 km south west of the proposed development site.

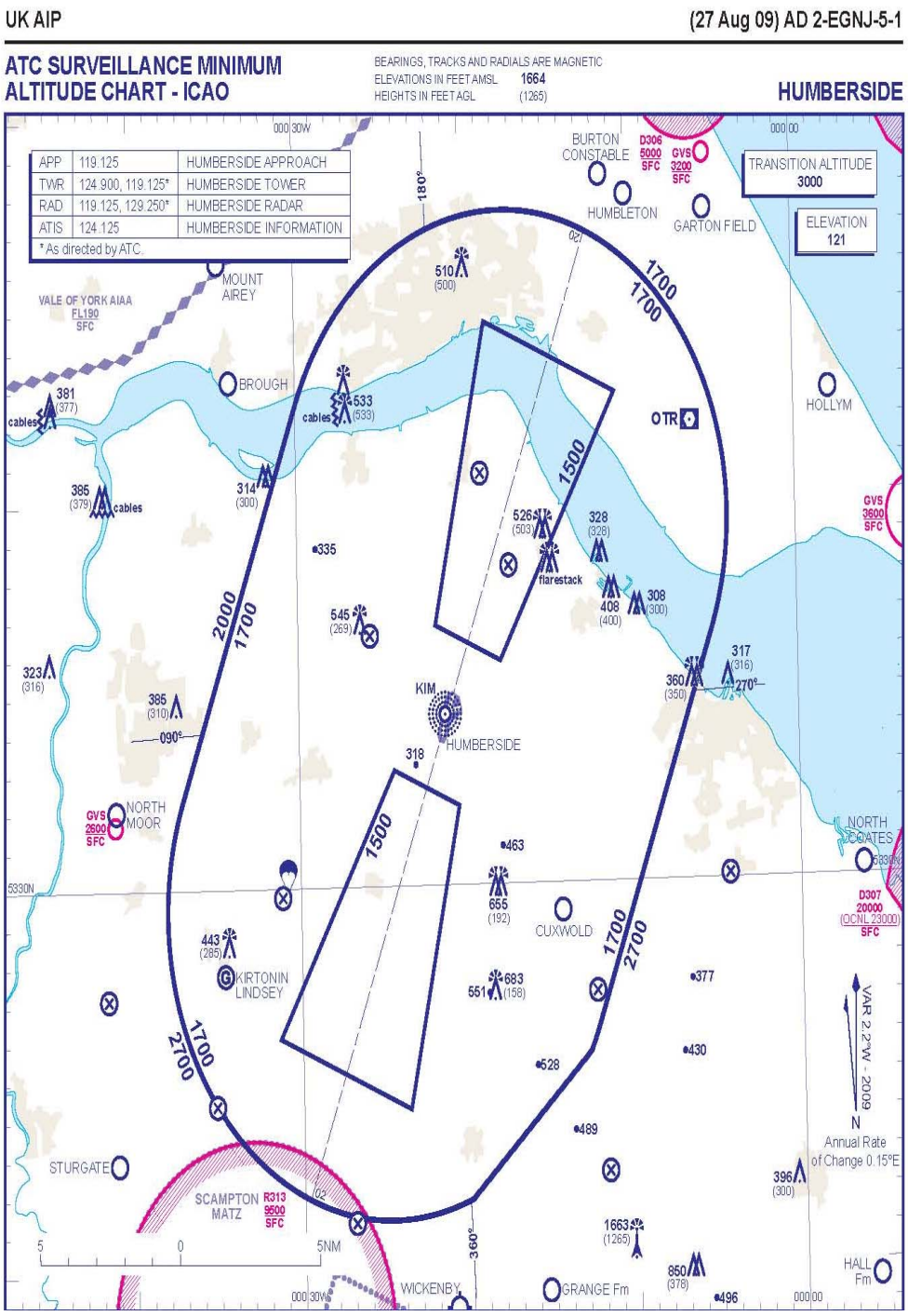
6.17.3 Humberside airport recently considered the reclassification of an area of airspace in the immediate vicinity of the airport to enhance flight safety. However, plans to do so have since been postponed due to the recent economic downturn, but this issue may arise again in the future.

6.17.4 Humberside airport not only serves scheduled and charter air passengers, but has a thriving freight operation and is home to the

second largest heliport in the country serving the offshore oil and gas industry in the North Sea.

6.17.5 *The CAA Policy and Guidelines on Wind Turbines* provides policy and guidance on a range of issues associated with wind turbines and their effect on aviation. *Figure 6.12* shows the Minimum Altitude Clearance at Humberside Airport which includes the space above the proposed development.

Figure 6.12 Minimum Altitude Clearance Chart for Humberside Airport



Source: http://www.nats-uk.ead-it.com/public/index.php%3Foption=com_content&task=blogcategory&id=78&Itemid=127.html

Potential Impacts

6.17.6 The erection of two turbines on the site and the stack from the biomass plant could potentially interfere with aviation operations within radar controlled local airspace, both civilian and military in nature. These impacts could occur during take-off or landing procedures and during low flying training, for example. Therefore it is necessary to consider in the EIA the likely impacts of the proposed development on aviation activities and to understand and assess these impacts.

Proposed Assessment Methodology

6.17.7 Humberside Airport and the Civil Aviation Authority (CAA) will be consulted during the EIA process to determine their views on the proposed development and the arrangement of safety lighting. The CAA published their Policy and Guidelines on Wind Turbines in May 2010 and their recommendations will be considered during the assessment. The consultations with CAA and other stakeholders engaged on the issue of aviation will inform the assessment of the impacts during both the construction and operational phases on aviation.

6.17.8 In determining the CAA's opinion on the wind turbines, the Directorate of Airspace Policy (DAP) in CAA will assess the wind turbine and stack proposals from a civil aviation perspective for potential areas of concern. The Ministry of Defence will be consulted to determine their opinion of the proposed development on military aviation in the vicinity of the proposed development.

6.18 WIND TURBINE IMPACTS

Introduction

6.18.1 This section addresses the issue of specific impacts due to the proposed wind turbines on the site and details the approach to assessing these impacts in the EIA.

Baseline Conditions and Sensitivities

6.18.2 In addressing the impacts of the proposed wind turbines, three separate issues will be considered:

- Microwave links;
- Ice-throw; and
- Shadow flicker.

6.18.3 Due to the high levels of industry on the Humber Estuary and the importance of the estuary to shipping there is a high degree of usage of microwaves for communication. There are several transmitters and receivers for radio communication which rely on microwave links in the general region of the proposed development. Microwave links are communication systems that utilise a beam of radio waves in the microwave frequency range to transmit video, audio or data between two locations. Users of microwave transmission equipment and microwave links will be identified as part of the EIA and consulted with in terms of impacts on the microwave links.

6.18.4 Ice-throw can be a considerable turbine risk in certain circumstances and must be assessed as part of the EIA. Due to local weather conditions and a turbine's operational state, any ice that accumulates on the turbine may be thrown from the turbine as a result of gravity and the mechanical forces of the rotating blades. The accumulated ice may be thrown several hundreds metres.

6.18.5 Although there are only three isolated residential properties within 100 m of the proposed development the impacts of shadow flicker will be assessed in order to determine their impacts on the adjacent ecology and nature designations as well as the persons employed on-site during the operational phase of the proposed development.

Potential Impacts

6.18.6 The communication links between transmitters and receivers in the region could be impacted due to the presence of the turbines and stack. Their presence cold lead to interference or distortion to the microwave links.

6.18.7 Within a certain distance of the turbines the ice throw and falling ice could cause damage to structures and vehicles and injury to site personnel and the general public.

6.18.8 Due to the angle of the sun, the time of the year and the location of wind turbines the effect of their blades casting shadows while in motion can cause a flickering effect and lead to a stroboscopic effect which can be a nuisance and possibly cause health problems to sensitive receptors. *The Companion Guide PPS 22 – Planning for Renewable Energy, Technical Annex Wind* indicates that shadow flicker will only affect properties within 130 degrees either side of north, relative to the turbines, and within a distance ten times the diameter of the blades.

Proposed Assessment Methodology

6.18.9 The impact of the proposed development will be assessed through a desk-based analysis utilising GIS to determine which radio pathways are used in the vicinity of the proposed development and how the turbines might cause and obstruction. The Office of Communications (Ofcom) is the government agency in the UK with responsibility for the radio spectrum and will therefore be consulted to establish the location of microwave links close to the proposed development

6.18.10 Existing data and literature addressing the issue of ice-throw will be reviewed as part of the assessment of the impacts from ice-throw. A desk-based assessment will be undertaken to fully assess the potential impacts of ice-throw and GIS will be used to determine the areas of the site and adjacent lands (if any) that may be within the range of ice throw and how the potential impacts of ice-throw can be mitigated.

6.18.11 The impact of turbine flicker will be determined based on the dimensions and specifications of the wind turbines and their position relative to residential housing, buildings on-site to be occupied by employees during the operational phase of the proposed development, and the adjacent ecological and nature conservation areas. GIS will be used to show the area that may be potentially affected by flicker and the geographic location of potentially sensitive receptors. The assessment of flicker will address the time, duration and potential effects on sensitive receptors.

7 CONSULTATION UNDERTAKEN TO DATE

7.1 OVERVIEW

7.1.1 As noted in *Chapter 2*, Able has already undertaken informal consultation and sought feedback from statutory and non-statutory organisations prior to the development of this Scoping Report through the preparation of an "*Informal pre-application consultation document*", issued on 8 July 2010.

7.1.2 Recent guidance issued by the IPC makes it clear that they require applicants to report on any consultation undertaken to date within the Scoping Report. Accordingly, this chapter describes the consultation that has been undertaken, provides an overview of the responses received and sets out either how these responses have been incorporated into the Scoping Report or how they will be dealt with in the EIA itself.

7.2 SUMMARY OF CONSULTATION UNDERTAKEN BY ABLE

7.2.1 Able has undertaken an informal stage of consultation for its proposed development. The bodies that have been consulted reflects the consultees required to be notified under *Section 42* of the Planning Act 2008 but also includes a number of non-statutory consultees. This consultation was a precursor to the formal pre-application consultation required by the Act, which will take place in early 2011.

7.2.2 The informal pre-application consultation document issued by Able gave consultees information on the following, based on details as they were understood at the time:

- a plan of the proposed development site
- a description of the development
- an outline of the options, including any alternatives considered
- an overview of anticipated impacts
- details of any hazardous materials required
- information on compulsory purchase and land exchange
- confirmation that an EIA is to be carried out
- information on the likely application date.

7.2.3 The organisations to whom the informal consultation document was sent are listed in full in *Annex A*; however, in summary the principal consultee groups and organisations included:

- Community Councils
- Local residents in the immediate vicinity of the site
- Local and Regional County and District Councils
- Regional Town and City Councils
- Natural England
- Lincolnshire Wildlife Trust
- RSPB
- Environment Agency
- Harbour Master, Humber
- Government Office for Yorkshire and Humber
- English Heritage
- Parish Councils
- Civil Aviation Authority
- Highways Agency
- Marine and Fisheries Agency
- Marine Management Organisation
- Maritime and Coastguard Agency

7.2.4 The full consultee list will be refined and potentially expanded for the formal pre-application stage, and Able will seek advice from the IPC on this point.

7.3 RESPONSES RECEIVED AND HOW THESE WILL BE DEALT WITH

7.3.1 The responses received from the informal consultation exercise highlighted a range of environmental issues, and included support for the proposed development. Able has carefully reviewed all these comments to assess their impact on the preparation of its application documents. Particular account will be taken of responses insofar as they affect the preparation of the ES.

7.3.2 In general terms, the majority of the issues raised informally by consultees have been taken into account in the preparation of this Scoping Report. The individual topic sections in *Chapter 6* describe where this been done in this report and how these issues will be subsequently assessed in detail in the EIA.

7.3.3 In overview, this Report has taken particular account of the following issues raised:

- Transport impacts from shipping, road and rail movements, including safety – these will be fully assessed in the Transport Assessment and also the ES. Impacts on aviation, particularly in respect of the helipad and wind turbines will also be addressed in

the ES, and consultation will take place with the relevant aviation bodies.

- Air quality (including dust control measures), noise and pollution – these issues are all highlighted in this report and will be examined in full in the ES.

- Landscape and visual impacts, including the preparation of photomontages – these issues are dealt with in this report, and will be considered in full in the ES.

- In-combination effects with other adjacent developments – this report addressed these issues, and the ES will consider them in detail.

- Natural England have raised a number of environmental issues, which have generally been referred to within the Nature Conservation and Aquatic Ecology section of *Chapter 6*. These concerns will be addressed in detail as part of the EIA, and also the *Appropriate Assessment*, and ongoing consultation will take place with Natural England. The project engineering team will consider the comments made in respect of the retention of dredged material in the estuary.

- Impacts on, and compensation for, European designated sites – this issue is raised by Natural England and others, and will be assessed as part of the EIA work.

- Flood management, site drainage and coastal protection – these issues will be dealt with both in the EIA and as part of the design work for the proposed development.

- Contaminated land, sediment and waste management issues – these will all be assessed as part of the EIA.

- Navigational safety assessments – this issue will be covered separately and reported on in the ES.

- The capacity of dredge disposal sites in the Humber – this issue will be given consideration by Able and reported in the ES.

- Impacts on archaeology and cultural heritage – these have been highlighted in this report and will be addressed in detail in the ES.

- Cooling water intake – this issue will be covered in the ES.

- Security issues – this will be addressed by Able and reported on where relevant in the ES.

7.3.4 A number of the comments highlight the need for significantly more design, build and operational detail with regard to all aspects of the project (biomass, dredging, helipad, wind turbines etc.) This is all being addressed by Able and its engineers and will inform the detailed EIA studies.

7.3.5 As further comments are received, including the IPC's Scoping Opinion, Able will continue to use them to inform its ongoing assessment and design for the proposed development where relevant.

8 SUMMARY & NEXT STEPS

8.1 SUMMARY OF SCOPE OF EIA

8.1.1 *Section 6* of this Scoping Report identifies all the topics that it is proposed will be assessed during the EIA process. There have been no major topics which were considered insignificant and not included in the EIA (i. *scoped out*) at this stage.

8.1.2 There are a number of cross-overs between the individual topics and assessment findings will be used during the consideration of other topics. For example the findings of the assessment of impacts on ecology and nature conservation will be strongly influenced by the findings of the noise, light and air quality assessments, amongst others.

8.1.3 The findings of the EIA, based on the application of the methodologies set out in *Section 6*, will be reported in the Environmental Statement (ES) to be submitted alongside the IPC application.

8.1.4 Once responses to the Scoping Report have been received by the IPC and their scoping opinion on the report returned to Able, the full EIA process will commence.

8.2 OUTLINE OF THE ENVIRONMENTAL STATEMENT

8.2.1 The outcome of the EIA process is the production of an ES to accompany the application to the IPC for development consent. An ES will be prepared that:

a. Describes the development;
b. Outlines the main alternatives considered;
c. Describes the baseline environment;
d. Describes the likely significant effects;
e. Describes measures envisaged to prevent, reduce and where possible offset any significant adverse effects, and
f. Includes a non-technical summary.

8.2.2 It is anticipated that the ES will comprise the following key sections, as set out in *Table 8.1*. A separate Non-Technical Summary (NTS) will be prepared, which will describe, in accessible and non-technical language, the main findings of the EIA.

Table 8.1 Indicative ES Structure and Contents

Section No.	Section Title
1	**Introduction**
1.1	Environmental Assessment
1.2	Location & Description of the Site
1.3	Scope & Structure of the Environmental Statement
1.4	Existing Planning Status
2	**The Environmental Assessment Process**
2.1	EIA Guidance
2.2	Objective & Study Area
2.3	Methodology
2.4	Phase Considerations
3	**Planning & Policy Context**
3.1	Introduction
3.2	National Planning Policy
3.3	Regional Planning Policy
3.4	Local Planning Policy
3.5	Planning History of the Site
3.6	Additional Planning Consents
4	**Description of the Development**
4.1	Introduction
4.2	General Description
4.3	Construction Methodology
5	**Need for the Development**
5.1	Introduction
5.2	Context
5.3	Impact Assessment
6	**Choice of Site**
6.1	Introduction
6.2	Justification
6.3	Constraints
7	**Hydrodynamic and Sedimentary Regime**
8	**Water Quality**
9	**Ecology & Nature Conservation**
10	**Commercial Fisheries**
11	**Drainage & Flood Risk**
12	**Noise**
13	**Air Quality**
14	**Light**
15	**Geology & Ground Conditions**
16	**Marine Archaeology**
17	**Terrestrial Archaeology**
18	**Commercial & Recreational Navigation**
19	**Traffic & Transport**
20	**Socio-economics**
21	**Landscape & Visual**
22	**Aviation**
23	**Wind Turbines**
24	**Cumulative & In-combination Effects**
22	**Mitigation & Monitoring**

8.2.3 Each of the topic specific chapters will be addressed under each of the following headings:

- Baseline and sensitivities;
- Potential impacts;
- Assessment methodology;
- Mitigation measures; and
- Residual impacts

8.3 NEXT STEPS

8.3.1 This Scoping Report was submitted to the IPC in early September 2010 for a Scoping Opinion on what the ES should contain.

8.3.2 Once the Scoping Opinion has been obtained from the IPC, preparations will be made for both the formal pre-application consultation stage under Sections 42 and 48 of the Planning Act 2008. Consultation will also be undertaken with the local community in accordance with Section 47 of the Planning Act and a Statement of Community Consultation (SoCC) will be prepared in consultation with North Lincolnshire Council. These consultation stages are expected to be carried out towards the end of 2010 and early 2011.

8.3.3 A website has been developed to provide information on matters relating to the proposed IPC application. The web address is www.ablehumberport.com.

9 GLOSSARY/ACRONYMS

AADT – Annual Average Daily Traffic

Able – Able UK Ltd

ABP – Associated British Ports

AHP – Able Humber Port

AMEP – Able Marine Energy Park

BAP – Biodiversity Action Plan

CD – Chart datum

CSM – Conceptual Site Model

dB - Decibels

DCO – Development Consent Order

DECC – Department of Energy and Climate Change

DEFRA – Department for the Environment, Food and Rural Affairs

EA – Environment Agency

EIA – Environmental Impact Assessment

EQS – Environmental Quality Standards

ES – Environmental Statement

EU – European Union

FRA – Flood Risk Assessment

GW – Gigawatt

ha – Hectare

HAP – Habitat Action Plan

HDV - Heavy Duty Vehicle

HGV – Heavy Goods Vehicle

HST – Humber Sea Terminal

IPC – Infrastructure Planning Commission

km – Kilometre

LGV – Light Goods Vehicle

LPG – Liquefied Petroleum Gas

m – Metre

MW - megawatt

NELDB – North East Lindsey Drainage Board

NPS – National Policy Statement

NSIP – Nationally Significant Infrastructure Projects

PPL – Potential Pollutant Linkages

psu – Practical Salinity Unit

Ramsar Convention – an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources

Ro-Ro – roll-on roll-off facility

SAC – protected sites and species in accordance with EU Habitats Directive

SCI – Site of Community Interest

SPA –protected sites classified in accordance with Article 4 of the EU Birds Directive

SSSI – Site of Special Scientific Interest

VTS – Vessel Traffic Services

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Annex A

Bodies / Organisations Consulted prior to Scoping Report

CONSULTATION ACTIVITIES

Able has already undertaken informal consultation and sought feedback from statutory and non-statutory organisations prior to the development of this Scoping Report through the preparation of an *"Informal pre-application consultation document"*, issued on 8 July 2010.

The organisations to whom the informal consultation document was sent are listed in full in the table below.

"Informal" Consultation Bodies / Organisations
2Co Energy Limited
Alkborough Parish Council
Alstom
Ambau
Amcotts Parish Council
AMEC Wind
Anglian Water
Anglian Water Services Ltd
AONB
Appleby Parish Council
Arqiva Ltd
Ashby Parkland Parish Council
Associated British Ports
Barnetby le Wold Parish Council
Barrow upon Humber Parish Council
Barton Town Council
Bassetlaw District Council
BDB Law
Belton Parish Council
Bethany Jayne Ltd
Bioethanol Ltd
Bluestar Fibres Company Ltd
Bonby Parish Council
British Pipeline Agency
British Telecommunication Plc
British Waterways North East
Brocklesby Parish Council
Broughton Town Council
Burringham Parish Council
Burton upon Stather Parish Council
BVG Associates Ltd
BVG Associates Ltd
Cable & Wireless
Cadney-cum-Howsham Parish Council
CE Electic UK
Centrica Energy
Cobelfret
Commission for Architecture & the Built Env.
Commission for Rural Communities
Commission for Sustainable Development
Conoco Phillips
Corus
Costain Ltd
Crowle Town Council
DB Schenker Rail (UK) Ltd
Department for Business, Innovation and Skills

"Informal" Consultation Bodies / Organisations
Department for Transport
Department of Energy and Climate Change
DFDS
Disabled Person Transport Advisory Commitee
Doncaster Finningley Airport
Doncaster Metropolitan Borough Council
Dong Energy
DRAX Power Station
East Anglia Offshore Wind Ltd
East Butterwick Parish Council
East Halton Parish Council
East Midlands & Humberside Airport
East Midlands Development Agency
East Midlands Trains
East Riding of Yorkshire Council
Eastoft Parish Council
Elsham Parish Council
English Heritage (Yorkshire Region)
Environment Agency
Eon UK Plc
ESB International
First Transpennine Express
Flixborough Parish Council
Forestry Commission England Sherwood and Lincs. Forest District
Forewind
Forward Planning Unit
Fred.Olsen Windcarrier
Freight Transport Assoication Northern Region
Freightliner
Gamesa
Garthorpe & Fockerby Parish Council
GBA Group of Companies
GE
Gerald Eve
Government Office for Yorkshire & Humber
Goxhill Parish Council
Gunness Parish Council
GVA Grimley
Habrough Parish Council
Haxey Parish Council
Health & Safety Executive
Hibaldstow Parish Council
Historic Buildings & Monuments Comission
Hochtief Construction AG
Holme Parish Meeting
Homes & Communities Agency
Horkstow Parish Meeting
Hornsby Travel Services Ltd
Hull & Goole Port Health Authority
Hull & Humber Chamber of Commerce
Humber & Wolds Rural Community Council
Humber Economic Partnership Ltd
Humber Gateway Delivery Group
Humber INCA
Humberside Fire & Rescue Service
Intergrated Transport Auth. & Passenger Transport
Isle of Axholme Internal Drainage Board
Keadby with Althorpe Parish Council
Kirmington & Croxton Parish Council

"Informal" Consultation Bodies / Organisations
Lighthouse Community
Local Government Yorkshire & Humber
Luddington & Haldenby Parish Council
Mainstream Renewable Power
Manton Parish Meeting
Melton Ross Parish Council
Member of European Parliament for Yorkshire & Humber
Member of Parliament Beverley and Holderness
Member of Parliament Brigg and Goole
Member of Parliament Cleethorpes
Member of Parliament Great Grimsby
Member of Parliament Home Secretary
Member of Parliament Kingston upon Hull (East)
Member of Parliament Kingston upon Hull (North)
Member of Parliament Kingston upon Hull (West and Hessle)
Member of Parliament Scunthorpe
Member of Parliament Secretary of State for Communities and Local Government
Messingham Parish Council
Ministry Of Defence Estates
National Grid Gas PLC
NELDB Internal Drainage Board
Network Rail
New Holland Parish Council
NHS North Lincolnshire
NOF Energy
North Killingholme Parish Council
Northern Lincolnshire & Goole Hospitals NHS Trust
Northern Rail
Nottinghamshire Police Authority
Office of Gas & Electricity Markets
Owston Ferry Parish Council
Passenger Focus
PricewaterhouseCoopers LLP
Redbourne Parish Council
Relevant Local Resilience Forum
RMS
Road Haulage Association (Southern and Eastern)
Roxby cum Risby Parish Council
Royal Society of the Protection of Birds
RWE Npower Renewables Ltd
Savills
Saxby All Saints Parish Council
Scawby Parish Council
Scottish & Southern Energy PLC
SeaGreen Wind Energy
Severn Trent Water Ltd
Shire Group of Internal Drainage Boards
Siemens
Siemens Project Ventures
Siemens Wind Power A/S
Simon Ports
Skykon
SmartWind
South Ferriby Parish Council
South Killingholme Parish Council
South Yorkshire Police Authority
Sport England
SSE Renewables
Stagecoach in Lincolnshire (Lincolnshire Road Car Ltd)

"Informal" Consultation Bodies / Organisations
Svitzer
The British Wind Energy Association
The Coal Authority
The Crown Estate
The Crown Estate Commissioners
Thornton Curtis Parish Council
TOTAL Lindsey Oil Refinery
Trinity House
UK Renewables Ltd.
Ulceby Parish Council
Vestas
VVM Cement
Water Services Regulation Authority
West Butterwick Parish Council
West Halton & Coleby Parish Council
Whitton Parish Meeting
Winteringham Parish Council
Winterton Town Council
Wootton Parish Council
Worlaby Parish Council
Wrawby Parish Council
Wroot Parish Council
Xanthus Energy
YEDL/NEDL
Yorkshire and The Humber Strategic Health Authority
Yorkshire Forward
Yorkshire Tourist Board
Yorkshire Water Plc.

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