

# REPORT

## **Boston Alternative Energy Facility - Preliminary Environmental Information Report**

### Chapter 18 Navigational Issues

Client: Alternative Use Boston Projects Ltd

Reference: PB6934-RHD-01-ZZ-RP-N-2018

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Project related



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## Non-Technical Summary

The proposed Boston Alternative Energy Facility (the 'Facility') is located on The Haven which is a tidally restricted waterway where vessel movement and size are restricted.

Part of the infrastructure for the Facility will be a new 400 m wharf, which will have three berthing points to receive vessels that will visit the Facility. Two of the berths will be dedicated to the delivery of refuse derived fuel (RDF); one berth will be dedicated to the loading of lightweight aggregate produced by the lightweight aggregate (LWA) plant within the Facility and also for the receipt of dredged material and / or clay, which is used as a binder in the production of the lightweight aggregate.

The anticipated size of vessels used for the handling of materials to / from the proposed Facility will be similar to commercial vessels that currently use The Haven and visit the Port; with an anticipated length of 100 m, bearing a load of approximately 2,500 tonnes. All vessels will be required to access the Facility at or around the high tide. It is anticipated that vessels will depart on the following high tide. All vessels will require a pilot to guide the vessel to the berth from The Wash and return.

There is no means of turning the vessels at the proposed Facility, therefore, there will be a requirement to turn vessels either in the Wet Dock, or at the Knuckle point just outside of the Wet Dock, of the Port of Boston.

The construction, operation and decommissioning of the proposed Facility have the potential to result in impacts to existing users of The Haven from a navigation perspective.

A Navigation Risk Assessment (NRA) is to be undertaken in consultation with key stakeholders in the area, including the Port of Boston, the local fishing fleet and other river users to appropriately and proportionately assess the significance of potential impacts. The Navigation Risk Assessment is being prepared for the Preliminary Environmental Information (PEI) phase of the Environmental Impact Assessment (EIA) for the Facility and will be appended to the PEI Report (PEIR).

The impact assessment will be informed by the findings of the final Navigation Risk Assessment (which will be appended to the Environmental Statement (ES)), which will be informed and updated by consultation with the key stakeholders and the results will be presented in the ES.

## 18 Navigational Issues

### 18.1 Introduction

- 18.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) describes the existing environment in relation to commercial and recreational navigation and identifies the potential impacts which could arise during the construction, operational and decommissioning phases of the Facility.
- 18.1.2 Consultation with the Port of Boston in November 2018 confirmed that the most appropriate mechanism to assess the potential impacts to existing navigation would be via a Navigational Risk Workshop. An initial workshop to discuss the methodology, receptors and potential impacts was held on 27<sup>th</sup> March 2019. The workshop was attended by scheme designers, key representatives/stakeholders at the Port of Boston and key individuals responsible for the completion of the impact assessment.
- 18.1.3 At the workshop it was agreed that the Navigational Risk Assessment (NRA), and therefore the content of the final Navigation Environmental Statement (ES) chapter, would be produced in partnership with the Port of Boston. As such, this Navigation chapter of the PEIR presents the relevant legislation, policy and guidance, the impact assessment methodology and information on the existing environment. The impact assessment has not been finalised and therefore the findings of such assessment are not available for inclusion in this report; rather, the key potential environmental impacts which could arise have been identified. These potential impacts will be assessed through liaison with the Port of Boston, and the findings of the assessment will be fully reported within the ES.

### 18.2 Legislation, Policy and Guidance

#### Legislation

##### International Regulations for the Prevention of Collisions at Sea (COLREGs) (1972)

- 18.2.1 The International Regulations for the Prevention of Collisions at Sea (COLREGs) (International Maritime Organisation, 1972) set out navigational rules to be followed by ships and other vessels at sea to prevent collisions between two or more vessels.
- 18.2.2 The COLREGs include 41 rules divided into six sections: Part A - General; Part B - Steering and Sailing; Part C - Lights and Shapes; Part D - Sound and Light signals; Part E - Exemptions; and Part F - Verification of compliance with the provisions of the Convention. There are also four Annexes containing technical requirements concerning lights and shapes and their positioning; sound signalling appliances; additional signals for fishing vessels when operating in close

proximity, and international distress signals.

#### The Boston Harbour Acts and Revision Order 1812 to 1989

18.2.3 The combination of the Boston Corporation Acts 1812 to 1935 and The Boston Harbour Revision Order 1989 (HMSO, 1989) designated Port of Boston Limited as the Harbour Authority for the Boston Port, harbour, dock and anchorage areas in The Wash (**Figure 18.1** and **Figure 18.2**).

#### Merchant Shipping Act 1995

18.2.4 The Merchant Shipping Act 1995 (HMSO, 1995) consolidated the Merchant Shipping Acts 1894 to 1994 and amongst the many provisions, designated each Harbour Authority as the Local Lighthouse Authority within its area.

### **National Planning Policy**

#### National Policy Statement for Ports

18.2.5 The National Policy Statement for Ports (Department for Transport, 2012) does not provide any guidance or policy with regard to assessment of impacts to commercial navigation. It specifies thresholds for Port projects that would be considered Nationally Significant Infrastructure Projects (NSIPs) on their own merits. The wharf requirements for the proposed Boston Alternative Energy Facility (the 'Facility') do not meet the thresholds, so the policy implications for the Facility will instead be directed by the policies identified below.

#### Marine Policy Statement

18.2.6 As outlined within the UK Marine Policy Statement (MPS) (Defra, 2011) (authorised by Section 44 of the Marine and Coastal Access Act (HMSO, 2009)), port development may result in an increase in shipping activity. When considering any potential increase in shipping activity, the MPS states (in Paragraph 3.4.10) that:

*“marine plan authorities and decision makers should ensure that the social and economic benefits and environmental impacts are taken into account and that impacts are considered in line with sustainable development principles”.*

18.2.7 The MPS also states (in Paragraph 3.4.7) that marine plan authorities and decision makers should:

*“take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law”.*

18.2.8 As outlined in Paragraph 3.4.6 of the MPS, environmental impacts arising from shipping activity can be through:

*“accidental pollution from ships in the course of navigation or lawful operations, pollution caused by unlawful operations or physical damage caused by collisions”.*

18.2.9 The impact assessment which will be undertaken within the ES in consultation with the Port of Boston will address the requirements of the MPS.

18.2.10 The MPS goes on to state (in Paragraph 3.4.6) that:

*“other pressures on the environment from shipping activity relate to noise and airborne emissions”.*

18.2.11 These potential impacts (specifically noise and airborne emissions) are assessed within the following chapters within this PEIR (**Chapter 10 Noise and Vibration** and **Chapter 14 Air Quality**), where they are relevant to the proposed scheme.

#### The East Marine Plan

18.2.12 Through the Marine and Access Coastal Act 2009 (HMSO, 2009), the UK Government introduced several measures to deliver its vision of

*“clean, healthy, safe, productive and biologically diverse oceans and seas”.*

18.2.13 These measures included the introduction of a marine planning system. Marine Plans, together with the MPS, underpin the new planning system for England’s seas.

18.2.14 Policy PS3 of the East Marine Plan (Defra, 2014) directly addresses navigational impacts. The Marine Plan aims to ensure safe and commercially viable navigation in the seas as well as in the ports and their approaches, consistent with the National Policy Planning Framework (NPPF) and NPS for Ports. Policy PS3 from the East Marine Plan is repeated below for reference.

#### **Policy PS3**

*Proposals should demonstrate, in order of preference:*

- a) that they will not interfere with current activity and future opportunity for expansion of ports and harbours.*
- b) how, if the proposal may interfere with current activity and future opportunities for expansion, they will minimise this.*
- c) how, if the interference cannot be minimised, it will be mitigated.*
- d) the case for proceeding if it is not possible to minimise or mitigate the interference.*

18.2.15 The requirements of Policy PS3 will be taken into account within the impact assessment. The Navigational Risk Workshop will be undertaken to discuss the significance of potential impacts and any requirements for mitigation to reduce any potential impacts to within acceptable levels.

### **Local Planning Policy**

#### South-East Lincolnshire Local Plan 2011-2036

18.2.16 The South-East Lincolnshire Local Plan (SELLP) (South-East Lincolnshire Joint Strategic Planning Committee, 2017) was adopted by the South-East Lincolnshire Joint Strategic Planning Committee on the 8th March 2019. The Plan has five main principles: Sustainable Development; Economy; Housing; Environment and Transport. The Plan will guide development in south-east Lincolnshire between 2011 and 2036.

18.2.17 The considerations of Policy ED2 of the Boston Local Plan 1999 were subsumed within a number of policies, including Policy 2: Development Management, Policy 3: Design of New Development, Policy 7: Improving South-East Lincolnshire's Employment Land Portfolio, Policy 28: The Natural Environment, Policy 30: Pollution, and Policy 33: Delivering a More Sustainable Transport Network.

18.2.18 Within Policy 28, paragraph 7.2.11 a project to link Lincoln and Ely with an inland waterway has involved the construction of a lock to link the tidal section of The Haven with the Black Sluice navigation. This project is tourism related and will encourage mariners to visit the area, as well as connecting habitats.

18.2.19 Policy 33 refers directly to the Port of Boston in C:5 by making a provision to ensure the continuous and safe operation of the Port of Boston and the Port of Sutton Bridge.

18.2.20 As such the SELLP ensures that the accessibility of The Haven is maintained for both recreational and commercial uses.

### **Guidance**

18.2.21 The main guidance document that will be considered in the impact assessment in the ES is the Harbour Approach Channels Design Guidelines (PIANC, 2014). Due to the nature of The Haven – a long narrow waterway with tidal restrictions - it is not considered to be a 'typical' harbour, and as such these guidelines will be used with caution. Any conclusions drawn from them will be consulted on with the Port of Boston to ensure they are applicable and proportionate to navigation within The Haven.

### 18.3 Consultation

- 18.3.1 Consultation undertaken throughout the pre-application phase has informed the approach taken and the information presented in this chapter of the PEIR. **Table 18.1** provides a summary of the comments received from The Planning Inspectorate within the Environmental Scoping Opinion (The Planning Inspectorate, 2018) with specific regard to navigation. **Table 18.1** also summarises the outcomes of the meetings held with the Port of Boston in November 2018 and March 2019, and a meeting held with the Fosdyke Fishing Society in April 2019.

Project Related

**Table 18.1 Summary of Consultation Undertaken During the Pre-Application Stage with Specific Regard to Navigation**

Consultee and Date	Response	Chapter section where consultation comment is addressed
The Planning Inspectorate Scoping Opinion (July 2018)	The Scoping Report states that information presented in the Boston Barrier ES is deemed applicable to the Boston Alternative Energy Facility because the document refers to the same area of the River Witham (The Haven) and was produced recently (August 2016). The Scoping Report does not provide sufficient detail about the Boston Barrier to allow confidence that this is the case. The ES should contain details of the Study Area used for the assessment and demonstrate how any existing data used has been applied to the assessment.	A justification for the evidence used in support of this assessment is presented in <b>Section 18.5</b> .
The Planning Inspectorate Scoping Opinion (July 2018)	The baseline information within the ES should be accurate and fully reflect the existing environment including the existing infrastructure and activities that take place on the River Witham. The baseline information should include anticipated traffic volumes and vessel type.	The baseline environment is presented in <b>Sections 18.5 and 18.6</b> of this chapter. Please also see <b>Chapter 5 Project Description</b> of the PEIR.
The Planning Inspectorate Scoping Opinion (July 2018)	The ES must set out the assumptions on which the assessment is based in relation to estimation of operating tonnage and ship movements, and the use of tugs for vessels etc. Where elements are unknown and flexibility is sought, e.g. the number of vessels operation to deliver feedstock, the Inspectorate advises that the ES should assess a worst case scenario and that the ES should explain how this has been determined with respect to navigational concerns.	<b>Chapter 5 Project Description</b> provides details on the vessel sizes and numbers on which this assessment is based. The Navigational Risk Assessment and subsequent impact assessment will be based on the worst case scenario for the construction and operation phases.
The Planning Inspectorate Scoping Opinion (July 2018)	The ES should include an assessment of likely significant effects resulting from impacts on existing activities including dredging and vessel users. As part of this, the ES should provide details of how the wharf will be constructed, including the anticipated timescales and any restrictions on the main	Please refer to <b>Chapter 5 Project Description</b> of the PEIR. Initial potential impacts are presented in <b>Section 18.7</b> and the full impact assessment will be presented within the ES chapter.

Project Related

Consultee and Date	Response	Chapter section where consultation comment is addressed
	river. The Inspectorate considers that lighting from a navigation perspective should also be considered within the ES, and any significant effects assessed.	
The Planning Inspectorate Scoping Opinion (July 2018)	The Scoping Report provides minimal information regarding the routing of ships bringing feedstock to the Application Site. The ES should explain the assumptions with regards to the likely source of ships delivering the materials and provide an assessment of the associated impacts these movements may have on existing users of the River Witham.	Please refer to <b>Chapter 5 Project Description</b> of the PEIR. An assessment of the any associated impacts to existing users of the Haven will be assessed within the Navigational Risk Assessment and presented within the ES. Proposed methodology for this assessment is defined in <b>Section 18.4</b> .
The Planning Inspectorate Scoping Opinion (July 2018)	The MMO welcomes the intention in 6.11.20 [of the Scoping Report] to supplement the Navigational Impact Assessment by consultation and would expect consultees to include the RYA and local boat and canoe clubs.	Noted. A meeting with the local boat and canoe clubs has been requested and a record of the consultation will be provided.
Port of Boston (July 2018)	A major capital dredging campaign is an essential ingredient in the construction of the new wharf facility, including dredging within and directly adjacent to the main navigation channel. The Port is concerned that the Scoping Report understates this impact, since in order to facilitate safe access for ships onto the newly created river berths, significant dredging will be needed, including extensive transitions upstream and downstream of the facility.	This impact is to be fully assessed within the Navigation Risk Assessment, in consultation with the Port of Boston and other river users which will be presented within the ES chapter. Impacts to hydromorphology, as assessed within <b>Chapter 16 Estuarine Processes</b> , will be used to inform this assessment.
Port of Boston (July 2018)	Whilst the Port accepts the relevance of the Boston Barrier ES to the Boston Alternative Energy Facility project, and that it provides some relevant data upon which to rely, it may not bound the full range of issues that are relevant to this project, and therefore it should be considered informative only, rather than assuming that it remains a reliable baseline.	We have used this information to inform our understanding of the baseline ( <b>Section 18.6</b> ) and have supplemented this in consultation with the Port of Boston.
Port of Boston (July 2018)	The predominant users of the river are the commercial shipping and the fishing fleet. Recreational traffic and other	The statement is noted. Impacts to recreational users will be assessed in consultation with local users and

Project Related

Consultee and Date	Response	Chapter section where consultation comment is addressed
	commercial activity, e.g. tripper boats, is extremely small by comparison.	organisations and reported in the Navigational Risk Assessment to be submitted with the ES.
Port of Boston (July 2018)	The description [given in paragraph 6.11.8 of the Scoping Report] is not accurate as the timings of fishing vessel and recreational vessel movements can and do occur at other times to those indicated. The prescriptive description is unhelpful and not representative of the range and timings of movements.	A description of the timings of fishing and recreational vessel movements has been updated following consultation with the Port of Boston and the Fosdyke Fishing Society (see <b>Section 18.6</b> )
Port of Boston (July 2018)	It is the Harbour Authority that is responsible for the control of shipping. We note that Port of Boston Pilots report to Port Control their position in the river at dedicated reporting points, however, Port Control does not routinely use VHF to notify other river users of shipping movements.	This is included in <b>Section 18.6</b> .
Port of Boston (July 2018)	The description of the river lights is incorrect [in paragraph 6.11.10 of the Scoping Report]. We note that the river benefits from navigational aids in accordance with Trinity House protocols, with Port of Boston being the Local Lighthouse Authority.	An updated description of the river lights is provided in <b>Section 18.6</b> .
Port of Boston (July 2018)	The tonnage described [in paragraph 6.11.11 of the Scoping Report] are inconsistent with the vessel size indicated elsewhere. We note that 2,500 tonne deadweight vessels with low draught would be more suitable for calling at the port in the majority of tidal conditions.	Please refer to <b>Chapter 5 Project Description</b> of the PEIR for an updated project description and information on the vessels anticipated to be used at the Facility. Vessels will arrive and leave at high tide only.
Port of Boston (July 2018)	The potential impacts described exclude: <ul style="list-style-type: none"> <li>- the impact on passing vessels</li> <li>- the impact on swinging vessels.</li> </ul>	<b>Section 18.7</b> discusses the potential impacts to navigation. These will be fully assessed within the NRA and ES, in consultation with the Port of Boston.
Port of Boston (July 2018)	The Port could not accept reduced manoeuvrability or river width post completion of the project.	This statement is noted. This potential impact has been discussed at the March 2019 workshop and will be included within the design of the scheme.

Project Related

Consultee and Date	Response	Chapter section where consultation comment is addressed
Port of Boston (July 2018)	The Port advises that a Navigation Impact Assessment is carried out, which contains a Navigation Risk Assessment. The Navigation Impact Assessment should look to identify mitigation to inform the detailed design, the construction methodology and construction sequencing. The Navigation Impact Assessment should be carried out in conjunction with the Harbour Authority. Further the Port advises that the Navigation Impact Assessment might be used to inform the development of a Navigation Management Plan that would set out the procedures to be followed and the aids to navigation to be provided to mitigate the risks to navigation arising from the construction and operation of the Boston Alternative Energy Facility.	Following an initial meeting with the Port of Boston in November 2018 it was agreed to hold a workshop with the Port to discuss the potential impacts of the project and define appropriate mitigation. This workshop was held on the 27 <sup>th</sup> March 2019 and comments are provided below.
Port of Boston (July 2018)	Lighting of a large gasification plant this close to the river could have an adverse effect on the safety of navigation and should therefore be scoped in to the EIA.	The PEIR <b>Chapter 5 Project Description</b> covers lighting issues. This impact is included in <b>Section 18.718.7</b> and will be considered in full within the NRA, with the significance of impacts determined through consultation with the Port of Boston and other river users throughout the impact assessment process.
Port of Boston (November 2018)	The Boston Barrier project will upgrade the 'Knuckle' and widen the in-river turning circle which will facilitate in-river turning of vessels. The project is also widening the entrance to Wet Dock and as such the size of vessel entering Wet Dock will increase to 16.5m in the beam. The maximum draft of vessels will also increase. Wet Dock will be closing in 2020 for this work/	This is described in <b>Section 18.6</b> .
Port of Boston (March 2019)	The Harbour River Order covers the Port's anchorage points in The Wash as well (i.e. it extends further than the end of The Haven). Note that these anchorage points should be	The Port of Boston anchorage points have been included in <b>Figure 18.1</b> .

Project Related

Consultee and Date	Response	Chapter section where consultation comment is addressed
	identified in any Figure that represents the Study Area for Navigation.	
Port of Boston (March 2019)	There are some acts which have not been included (1812 Act, Boston Docks Act, Docks, Piers and Clauses Act)	These have been included in <b>Section 18.2</b> .
Port of Boston (March 2019)	The Harbour Approach Guidelines (PIANC) are not specific to each river so reference to them should be used carefully. Specifically, with reference to river width guidelines, The Haven is likely to be narrower than recommended guidelines.	This is reflected in <b>Section 18.2</b> .
Port of Boston (March 2019)	Port of Boston tide timetables should be used as a reliable data source. They use the Boston Sill data. The Sill data should always be quoted alongside any references to AOD when presenting tide data.	All reference to tides and water depth in this chapter are referred to in Ordnance Datum and Boston Sill datum.
Port of Boston (March 2019)	The Port had the following comments on <b>Section 18.6</b> : The port's dredger has a plough/hopper attachment; Currently the port dredges 20-30,000 tonnes. Their licence allows up to 60,000 tonnes; The theoretical maximum draught of vessels is 7m however, the practical maximum is around 6.3-6.4m; There are 26 fishing vessels licenced at the Port of Boston; and, There may be more than 12 Marine leisure cruises – should meet these to confirm.	These are all reflected in <b>Section 18.6</b> and a meeting with the Boston Belle has been requested.
Port of Boston (March 2019)	The Port had the following comments on <b>Section 18.7</b> : The assessment will have to consider the cumulative impacts such as lighting with the Boston One facility The main construction related impacts that Port would want to avoid include, closure of navigation, minimising dredging from ships and would want piling to be done from the shore as well.	These will be considered in full within the NRA and ES chapter. The project team have also confirmed with the Port that there will not be any closures of the river during construction of the Facility. The requirement for maintenance dredging will be assessed within <b>Chapter 16 Estuarine Processes</b> .

Project Related

Consultee and Date	Response	Chapter section where consultation comment is addressed
	<p>The Port expects that this project will require no closure to river traffic.</p> <p>The Port was also concerned that construction and operation could lead to an increased requirement of maintenance dredging the channel.</p>	
Fosdyke Fishing Society (April 2019)	<p>The fishermen expressed concern for two main items:</p> <p>A narrowing of the river width at the Facility would make it difficult for them to pass and;</p> <p>Increased use of the turning circle would delay them leaving or returning to their berths.</p>	<p>These impacts are included within <b>Section 18.7</b> and will be fully assessed within the NRA and ES.</p>

## 18.4 Assessment Methodology

### Impact Assessment Methodology

18.4.1 The impact assessment will draw upon the findings of a Navigational Risk Assessment (NRA) and the methodology used therein. The NRA will be undertaken in consultation with the Port of Boston (the Harbour Authority) and will follow standard industry methodology.

18.4.2 The outcomes of the NRA will be presented in the ES and the significance of potential impacts with regard to navigation will follow the impact assessment methodology set out below.

### Receptors

18.4.3 The navigational receptors within The Haven are defined as the following:

- The Port of Boston;
- Fishermen;
- Other commercial operators; and
- Recreational users.

### Sensitivity

18.4.4 A receptor can only be affected if there is a pathway through which a source impact can be transmitted between the activity and the receptor. When a receptor is exposed to an impact, the overall sensitivity of the receptor in a navigational context is determined through expert judgement and through consultation with stakeholders.

18.4.5 For the purposes of assessing the impact to receptors, sensitivity must be scored. The criteria range from low sensitivity to very high. The greater the business/safety/operational impact, and/or the lower the ability to adapt to the impact, the greater the sensitivity.

18.4.6 Types of impacts:

- Safety impact – a safety impact is classified as any impact that may influence the navigational safety of the receptor;
- Operational impact – is defined as any impact that affects the receptor's day to day operation; and,
- Business impact – is defined as any impact that affects the receptor's business and is considered in two ways – financial loss and loss of business reputation.

18.4.7 **Table 18.2** presents the sensitivity definitions used for this assessment.

**Table 18.2 Sensitivity Criteria and Definition**

Sensitivity	Definition
Very high	Very high level of safety/operational/business impact for navigation receptors. Very limited ability to adapt to impact
High	High level of safety/operational/business impact for navigation receptors. Limited ability to adapt to impact
Medium	Medium level of safety/operational/business impact for navigation receptors Some ability to adapt to impact.
Low	Low level of safety/operational/business impact for navigation receptors. Ability to adapt to majority of impact.
Very low	No impact to navigational receptors.

### Magnitude

18.4.8 When assessing the magnitude of an impact, the geographical extent, the duration and the likelihood of occurrence of the impact will be considered.

18.4.9 Determining the overall magnitude of navigational impacts also incorporates a degree of subjectivity. The magnitude will be assessed based on professional industry experience in marine structures and navigation in combination with baseline data and consultation with stakeholders.

18.4.10 **Table 18.3** presents the definition of magnitude used in this assessment.

**Table 18.3 Magnitude Criteria and Definition**

Magnitude	Definition
High	Impacts a geographical area beyond The Haven. Impact present on a permanent basis, throughout the construction or operation of the Facility. Impact is very likely to occur.
Medium	Impact localised to the geographical area of The Haven. Impact present up to a few months (long duration), throughout the construction or operation of the Facility. Impact likely to occur.
Low	Impact localised to a geographical area limited to a section along The Haven (i.e. the future location of the wharf at the Facility). Impact present up to a few weeks (short duration). Impact unlikely to occur.
Very low	Impact is very unlikely to occur.

### Impact significance

18.4.11 Based on the sensitivity of the receptor and the magnitude of the potential impact, the significance of the impact is determined according to the matrix presented in **Chapter 6 Approach to EIA, Table 6.1.**

18.4.12 Significant impacts in EIA terms are those that are of **major, major/moderate** and **moderate adverse** significance. All other outcomes are not considered significant for the purpose of EIA assessment.

### Cumulative Impact Assessment

18.4.13 An assessment of potential cumulative impacts within the Haven arising from the proposed scheme and other plans and projects will be undertaken within the NRA. The findings of the NRA from a cumulative perspective will be reported within the ES, with mitigation measures proposed as required.

### Transboundary Impact Assessment

18.4.14 Although most vessels visiting the Port of Boston originate from non-UK locations it is considered that the potential impacts of this project will be localised to the Haven. All of the refuse derived fuel (RDF) that is transported to the Facility will come from UK sources. All of the binder material that will be transported to come to the Facility will come from UK sources. The aggregate is proposed to be transported to UK sources. Therefore, it is unlikely that there will be any transboundary impacts.

## 18.5 Scope

### Study Area

18.5.1 The Study Area for the navigational assessment includes The Haven, from Tab's Head at the entrance to The Wash, to the upstream limit of the Port of Boston, or Swing Bridge, and the Port of Boston's anchorage areas within The Wash. Please refer to **Figure 18.1** and **Figure 18.2** for an illustration of this Study Area.

18.5.2 All references to bed levels and tidal heights will be provided in Ordnance Datum (OD) and Boston Sill Datum (BSD) which is 3.7m below OD.

### Data Sources

18.5.3 The assessment was undertaken with reference to several sources, as detailed in **Table 18.4**.

## Project Related

**Table 18.4 Key Information Sources**

Data Source	Reference
Environment Agency	Boston Barrier Technical Report: Navigational Impact Assessment (Environment Agency, 2016)
HM Government – Department for Transport	Annual Port Statistics - <a href="https://www.gov.uk/government/statistical-data-sets/port-and-domestic-waterborne-freight-statistics-port">https://www.gov.uk/government/statistical-data-sets/port-and-domestic-waterborne-freight-statistics-port</a>
Marine Traffic	Port of Boston vessel traffic data - <a href="https://www.marinetraffic.com/en/ais/details/ports/17346/United%20Kingdom_port:BOSTON?cb=9401">https://www.marinetraffic.com/en/ais/details/ports/17346/United%20Kingdom_port:BOSTON?cb=9401</a>

### Assumptions and Limitations

- 18.5.4 The Environment Agency undertook a Navigational Impact Assessment (NIA) for the Boston Barrier scheme in 2016 (Environment Agency, 2016). The Study Area used for the Boston Barrier NIA extended from the Grand Sluice (to the north of Boston) to the mouth of The Haven. This area encompasses the Study Area used for this chapter of the PEIR. Given that the Boston Barrier NIA (Environment Agency, 2016) was undertaken recently (2016), within a stretch of water which encompasses the Study Area used for this chapter, and in consultation with the Port of Boston, the local fishing fleet and recreational users, it is concluded that the information from the NIA is relevant to this report.
- 18.5.5 The Annual Port Statistics provided by the Department for Transport are provided to the Department for Transport directly from the Ports. It is therefore assumed that the data are accurate, and it is concluded that there are no limitations associated with using these data.
- 18.5.6 Marine Traffic uses live data from vessels carrying Automatic Identification Systems (AIS), which track real time ship positions as an aid to navigation. A limitation of these data is that the International Maritime Organisation's International Convention for the Safety of Life at Sea only requires AIS to be fitted onboard ships with 300 or more gross tonnage (GT). As such any vessels below 300 GT (such as fishing and recreational vessels) using The Haven will not be included in these datasets. To address this limitation in the data, consultation with the local fishermen was undertaken during a meeting on the 1<sup>st</sup> April 2019 and consultation will be undertaken throughout the impact assessment process.

## 18.6 Existing Environment

- 18.6.1 The Haven is fully tidal and comprised of the section of the River Witham between the Grand Sluice and The Wash. At the Port of Boston, The Haven is approximately 56 m in width, although the channel width ranges from 20 m to 90 m along its length. The bed level varies between -1.5 m OD (-5.2 mBSD) at Grand Sluice to -3.3 mOD (-7 mBSD) downstream of the Port of Boston entrance (Environment Agency, 2016).

- 18.6.2 The tidal influence of the North Sea and The Wash is obstructed by the Grand Sluice, which defines the upstream tidal limit of The Haven. Boston Gateway Marina is located upstream of the sluice offering moorings for recreational sailors. To the west, The Haven is connected by the Black Sluice lock, which can accommodate vessels up to 21 m long and 6 m wide and has a water retention level ranging from 0 to -0.6 mOD (-3.7 to -4.3 mBSD) depending on the season (Environment Agency, 2016).
- 18.6.3 The navigability of The Haven upstream of the Facility is constrained by three bridges with limited headroom at high water and limited under-keel clearance and channel width at low water (Environment Agency, 2016).
- 18.6.4 The Haven drains into the sea in a general north easterly direction. The Haven receives freshwater flows through artificially maintained sluice structures from the Witham (at Grand Sluice), the South Forty Foot Drain (at Black Sluice), Maud Foster Drain (and Sluice) and Hobhole Drain (and Sluice), until it eventually discharges into The Wash (**Figure 18.1**) (Environment Agency, 2016).

### Existing River Users

- 18.6.5 The main users of the Haven from a navigation perspective comprise:
- The Port of Boston;
  - The local fishing fleet;
  - Other commercial operators (specifically Maritime Leisure Cruises); and
  - Witham Sailing Club or the Boston Motor Boat club.
- 18.6.6 Each of these users is discussed in turn below.

### The Port of Boston

- 18.6.7 The Port of Boston is a privately-owned commercial business. The Port of Boston also acts as the Harbour Authority and Lighthouse Authority within its jurisdiction, which extends from The Wash to Grand Sluice. The Port of Boston provides compulsory pilotage services for all commercial vessels over 30m in length. Pilots board vessels in The Wash, before Tab's Head.
- 18.6.8 The Port handles, on average, approximately 800,000 tonnes of cargo per year, the vast majority of which arrives at the Port from the EU (see **Table 18.5** (Department for Transport, 2018)). This cargo is comprised of dry bulk, bulk, general cargo and some liquid bulk.

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18.6.9 From 2014 to 2017, approximately 400 ships arrived at the Port of Boston per year (on average), which equates to approximately eight ships per week (see **Table 18.5** (Department for Transport, 2018)).

18.6.10 The majority of vessels arriving at the Port are cargo vessels transporting bulk and cargo.

**Table 18.5 Vessel Traffic and Tonnage Data for the Port of Boston, 2014-2017 (Department for Transport, 2018)**

Year	Number of ships	Total traffic (thousand tonnes)	UK traffic (thousand tonnes)	EU traffic (thousand tonnes)	Non-EU traffic (thousand tonnes)
2017	386	738	0	718	20
2016	524	850	27	803	20
2015	413	852	23	793	37
2014	387	824	33	769	23

18.6.11 The Haven is largely self-scouring as sediment is moved into The Wash with large freshwater influxes (Richard Walker, Port of Boston, pers. comm, 2018).

18.6.12 The Port of Boston has a licence to dredge 60,000 (wet) tonnes of fine sediment per year from within the Port, at the approach berth (at the entrance to the Wet Dock), the river berths and within Wet Dock, and within The Haven at the Hobhole S Bend, to maintain access for shipping to the berths. **Figure 18.3** illustrates the locations of berths at the Port. Currently the actual volume of material dredged by the Port is 20,000 to 30,000 tonnes per annum, which is undertaken using the Port's grab-hopper dredger (Richard Walker, Port of Boston, pers. comm, 2018). The Port also has a plough dredger which is used to level peaks and troughs in the sediment.

18.6.13 The number of vessel movements within The Haven per tide can vary greatly, but generally up to four to five commercial vessels can transit The Haven per high tide. Due to the tidal nature of The Haven, vessels can generally transit up or down the Haven from approximately one to two hours before high tide, to 1.5 hours after high tide, giving a maximum tidal window for vessel movements of approximately 3.5 hours around high tide. Navigation of The Haven, from The Wash to the entrance of the Wet Dock at the Port of Boston, takes approximately one hour. Consequently, the Port of Boston operates on a 24 hour/7-day basis to be able to use both high tides per day. (Richard Walker, Port of Boston, pers. comm, 2018).

18.6.14 The Haven is largely a one-way channel for the large cargo vessels visiting the Port of Boston. Passing of vessels within the existing channel is possible, however this is limited to localised areas of the channel (specifically within the downstream section of The Haven between Tab's Head and Hobhole, and for approximately half a mile upstream of Hobhole (Richard Walker, Port of Boston, pers. comm, 2018). Please see **Figure 18.1** for an illustration of these locations.

18.6.15 The tidal nature of The Haven limits the size of vessels which are able to visit the Port. The current maximum dimensions of vessels capable of accessing the Port are listed in **Table 18.6**.

**Table 18.6 Typical and Maximum Dimensions of Vessels Visiting the Port of Boston**

Dimensions	Typical vessel (m)	Maximum vessel (m)
Length Overall (LOA)	90	119
Beam	13.6	13.6
Draft	5.5	6.4

18.6.16 Vessels with a 6.4 m draft can only access the Port of Boston at spring tides and at neap tides the draft is limited to approximately 3.5 m.

18.6.17 Visiting vessels are constrained in the beam to 13.6 m by the width of the dock entrance and constrained in length to 119 m as this is the largest ship that can be swung within the Port's Wet Dock. Vessels can also be swung in-river, however the maximum length of a vessel manoeuvring within the river is limited to 100 m (Richard Walker, Port of Boston, pers. comm, 2018).

18.6.18 Navigational safety of The Haven is the responsibility of all river users; however, overall responsibility for facilitating safe navigation on The Haven rests with the Port of Boston as the Statutory Harbour Authority.

#### The Boston Barrier Project

18.6.19 As part of the Boston Barrier project, several construction activities are being undertaken which will provide future benefits to the Port. These include:

- Strengthening the 'Knuckle' and South Knuckle berth at the entrance to Wet Dock;
- Widening the entrance to Wet Dock to 18m; and
- Dredging the in-river turning circle to a larger diameter.

18.6.20 The Port has applied to vary their dredging licence to allow it to undertake dredging for the Boston Barrier project which is currently in construction. Once varied this will include increasing the maintenance dredge target depths to accord

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with the capital dredge depth targets of the Barrier, the increase in size of the in-river turning circle, and changes to the method of dredging the NAABSA (Not Always Afloat But Safely Aground) river berths to plough dredging (Richard Walker, Port of Boston, pers. comm, 2018).

18.6.21 The widening of the Wet Dock entrance will increase the maximum size of vessels able to visit the Port to 119 m LOA, 16.5 m beam and 7 m draft (Richard Walker, Port of Boston, pers. comm, 2018).

18.6.22 The widening of the in-river turning circle will facilitate the turning of more vessels in-river, as most vessels are currently turned within Wet Dock (Richard Walker, Port of Boston, pers. comm, 2018).

### Fishing fleet

18.6.23 The fishing fleet at Boston berth upstream of the Swing Bridge. The fleet comprises conventional 'modern' steel hulled commercial fishing boats, with a typical registered length of between 10 m and 14 m. The fleet currently consists of approximately 24 vessels which are Boston (BN) registered of which 16 are over 10m LOA and eight are under 10m LOA (Marine Management Organisation, 2019a and 2019b).

18.6.24 The fishing fleet targets cockles, mussels and shrimp in the Wash at various times of the year. Generally, cockles are caught during April to October and are harvested using hydraulic suction dredgers or raked by hand from the intertidal sand banks within the entrance of The Haven (Environment Agency, 2016).

18.6.25 Shrimp is primarily caught during autumn and is taken from the edge of the channels on the Boston side of The Wash. Peak catches generally occur from October to November. Harvesting activity extends through the winter into spring depending on stocks (Environment Agency, 2016).

18.6.26 The fishing vessels have a minimum draft of 1.4 m and as such can navigate The Haven over a wider state of tide than the commercial vessels visiting the Port of Boston. Fishing vessels are also able to pass each other whilst navigating The Haven. The fishing vessels are known to take approximately 40 minutes to either get to or return from the fishing grounds in The Wash, although with strong tidal flow against the direction of travel, this can increase to up to an hour (Environment Agency, 2016).

18.6.27 Cockle fishing takes place over a single tide. For handpicked cockles, vessels leave at high tide to be over the beds and grounded at low tide. For suction dredging, vessels leave on a rising tide to be over the cockle beds at high tide (Environment Agency, 2016).

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18.6.28 Mussel fishing also takes place over a single tide. Natural mussel beds are harvested in a similar method to the handpicked cockles. Shrimp are either caught over a single tide trip, or for longer trips up to 36 hours (Environment Agency, 2016; Boston and Fosdyke Fishing Society, pers. comm., 2019).

18.6.29 The fleet is able to operate on any day of the year when the tide is suitable. However, the fishing operation is more opportunistic and is often governed by a combination of fish stocks, regulations, vessels, weather and the receiving market (Environment Agency, 2016).

### Other commercial operators

18.6.30 Maritime Leisure Cruises (MLC) Ltd own and operate the Boston Belle, a passenger boat, on trips of the River Witham, upstream of Grand Sluice, and of the Haven down and into The Wash (Boston Belle, 2018). Trips out to The Wash depart from the Boston Gateway Marina, upstream of Grand Sluice, on a rising tide as soon as there is sufficient water clearance through Grand Sluice lock. The trip returns approximately 4.5 hours later on the falling tide, before the water level is too low to pass through Grand Sluice lock (Boston Belle, 2018).

18.6.31 These trips are seasonal and dependent on a favourable tide. In 2018, 12 trips were scheduled between April and October (Boston Belle, 2018), however the Boston Belle also undertakes private trips, so the actual number of trips undertaken on The Haven could be more.

### Other users of The Haven

18.6.32 As well as the commercial operators and fishing fleet reported above, The Haven is also used by recreation vessels. Recreational users are generally affiliated with the Witham Sailing Club or the Boston Motor Boat club, which both have moorings located upstream of the Grand Sluice lock. Vessels are reported to leave Boston on the falling tide and return on the incoming tide to make use of tidal flows (Environment Agency, 2016).

18.6.33 **Table 18.8** summarises the main vessel characteristics and operating traffic patterns of the main users of The Haven.

### Navigational aids/regulations

18.6.34 There is a speed limit of 6 knots over The Haven. This speed restriction was put in place by the Environment Agency to protect the river banks (Richard Walker, Port of Boston, pers. comm, 2018). The Port of Boston do not enforce this speed limit, only advice safe speed under COLREGs. The speed of vessels, especially large cargo vessels, is restricted on The Haven due to water depth, the weather and the bends in the river.

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18.6.35 The navigational channel from Tab's Head to Swing Bridge is marked by navigational aids in accordance with Trinity House protocols, with the Port of Boston being the Local Lighthouse Authority.

18.6.36 The Port, as the Harbour Authority, is responsible for the control of shipping. Communication with the Port of Boston is via VHF channel 12. The Port of Boston Pilots report to Port Control their position in the river at dedicated reporting points, however Port Control does not routinely use VHF to notify other river users of shipping movements. The Port does not monitor leisure, fishing or other vessels on The Haven, only port traffic.

18.6.37 The Port of Boston issues Notice to Mariners for any unusual activities.

18.6.38 **Table 18.7** summarises the commercial and recreational users of The Haven.

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Table 18.7 Summary of Main Vessels Used Within the Haven

Typical fleet	Typical vessel (m)			Maximum vessel (m)			Operating pattern	Journey time from reported berths to the Wash
	LOA	Beam	Draft	LOA	Beam	Draft		
Cargo vessel	90	13.6	5.5	119	16.5	6.4	Ships time their arrival/departure to allow for enough clearance over the dock entrance sill – arriving or departing within 1-2 hours of high tide. The maximum vessel will increase to 119m LOA, 16.5m beam and 7m draft following the completion of the dock entrance widening undertaken as part of the Boston Barrier project (estimated to be 2020).	1 hour
Dredger	34	11	2.4	-	-	-	Dredging occurs on an ad-hoc basis following visual inspection of the berths	n/a
Pilot vessel	13	3	1.5	-	-	-	Pilot vessels travel from Port of Boston to The Wash to meet cargo vessels	30 minutes
Fishing vessel	11.5	5	1.4	-	-	-	Depart on an incoming tide and return on the ebb tide. Trip takes place over a single tide	1 hour
MLC ship (Boston Belle)	20	5	-	-	-	-	Depart on a rising tide as soon as Grand Sluice lock opens when there is sufficient draft in The Haven. Returns approximately 4.5 hours later on the falling tide before Grand Sluice lock closes	1 hour
Sailing boat	6	2.4	1.5	10	3.5	2.1	Departs on the falling tide and return on the rising tide such that there is sufficient time to transit The Haven while there is enough draft.	1 hour
Motor boat	9	2.7	2.3	9	2.7	2.3		1 hour

## 18.7 Potential Impacts

### Embedded Mitigation

18.7.1 No embedded mitigation measures have been considered as part of this assessment. These will be fully considered and assessed within the NRA and reported within the ES chapter.

### Potential Impacts during Construction

18.7.2 The following construction phase activities have potential to result in **adverse** impacts to operators who currently utilise The Haven for navigational purposes. **Table 18.8** outlines the activities, the potential impacts which could occur, the receptors which could be impacted and presents initial discussion.

**Table 18.8 Construction Activities, Potential Impacts and Receptors**

Activity	Potential impact(s)	Receptors	Notes
Capital dredging for the proposed wharf and berths (mainly to be carried out from land)	Reduced river width, reduced manoeuvrability for passing vessels and increased time to reach destination (safety and operation impact).	All	As works are proposed to be carried out from land it is considered that impacts to navigational width and manoeuvrability, and time taken to reach destination will be minimal ( <b>minor</b> ). However, this will depend on the final scope and methodology of the works and will be fully considered within the NRA and ES chapter.
Installation of the proposed wharf structure (to be carried out from land)	Reduced river width and reduced manoeuvrability for passing vessels (safety and operation impact).	All	
Installation of scour protection underneath/ adjacent to the proposed wharf (to be carried out from land)	Reduced river width, reduced manoeuvrability for passing vessels and increased time to reach destination (safety and operation impact).	All	
Presence of lighting for construction of the wharf and the main facility	Reduced visibility for pilots/skippers on vessels navigating The Haven at night (safety impact)	All	

18.7.3 All of the above impacts have potential to result in collision risk between construction-related vessels and existing vessel movements in The Haven, or delay to vessel movements. The significance of these impacts will be fully assessed within the NRA and ES chapter, through liaison with key stakeholders which currently utilise The Haven.

## Potential Impacts during Operation

18.7.4 It has been agreed with the Port of Boston (NRW workshop: March 2019) that the presence of the wharf will not reduce the width of the river and therefore affect the manoeuvrability and safety of passing vessels.

18.7.5 Therefore, the following operational phase activities have potential to result in **adverse** impacts to existing operators who currently utilise The Haven for navigational purposes. **Table 18.9** outlines the activities, the potential impacts which could occur, the receptors which could be impacted and presents initial discussion.

**Table 18.9 Operational Activities, Potential Impacts and Receptors**

Activity	Potential impact(s)	Receptors	Notes
Presence of the wharf and berthed vessels	Increased requirement for port-operated maintenance dredging of river channel (operation and business impact)	Port (operation and business)  Fishing fleet, commercial and recreational users (operation)	The Port would need to vary its maintenance dredging licence. Low water surveys and hydrographic surveys would be required to inform the dredging need. Where possible the majority of dredging would be carried out from shore to minimise impacts to users of The Haven.
Use of the in-river turning circle	Increased transit time for vessels during use of the in-river or dock basin turning circle (operation and business impact).	All	This may cause delays to vessels (port, fishing and leisure) leaving or returning to berths upstream of the turning circle. Turning within the dock basin may impact on vessels berthed in the dock. The sensitivity of the receptors to this impact will be determined in consultation with user groups.
Maintenance dredging at the proposed wharf	May prevent vessels berthing at the wharf.	Port (operation and business)	Contingency planning may be required should the required berth at the Facility be unavailable and the vessel would be required to berth at the Port.
Presence of lighting for the operation of the wharf and facility	Reduced visibility for pilots/skippers on vessels navigating The Haven at night	All	The lighting required at the wharf and facility will be designed carefully to ensure that impacts to navigation are minimised.

18.7.6 All of the above impacts have potential to result in collision risk between operational phase vessels and existing vessel movements in The Haven, and/or delay to vessel movements. The significance of these impacts will be fully assessed within the NRA and ES chapter, through liaison with key stakeholders

which utilise The Haven.

### Potential Impacts during Decommissioning

18.7.7 **Table 18.10** below outlines the activities taking place during the decommissioning of the proposed facility, the potential impacts which could occur as a result of the activity, the receptors which could be impacted and presents initial discussion.

18.7.8 As the wharf will replace the existing flood defence it is not envisaged that the wharf will be decommissioned. As the wharf will not have heavy loading capabilities, it is envisaged that the majority of materials imported or exported will be done via road or, if by sea, using the Port of Boston's facilities. The activities outlined below therefore consider the impact of the importation and exportation of materials through the Port of Boston during the decommissioning the proposed facility.

**Table 18.10 Decommissioning Activities, Potential Impacts and Receptors**

Activity	Potential impact(s)	Receptors	Notes
Importation/exportation of materials during the decommissioning of the facility.	Increased transit time for vessels during use of the in-river turning circle and dock basin (safety, operation and business impact).	All	This may cause delays to vessels (port, fishing and leisure) leaving or returning to berths upstream of the turning circle. Turning within the dock basin may impact on vessels berthed in the dock. The sensitivity of the receptors to this impact is expected to be the same as that for operational impacts

18.7.9 The impact assessment will fully assess potential decommissioning phase impacts.

### 18.8 Cumulative Impacts

18.8.1 Potential cumulative impacts arising from other plans and projects will be fully assessed within the NRA. The findings of the cumulative assessment will be presented within the ES.

### 18.9 Transboundary Impacts

18.9.1 Although most vessels visiting the Port of Boston originate from non-UK locations it is considered that the potential impacts of this project will be localised to the Haven. All of the refuse derived fuel (RDF) that is transported to the Facility will come from UK sources. All of the binder material that will be transported to come to the Facility will come from UK sources. The aggregate is proposed to be

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transported to UK sources. Therefore, it is unlikely that there will be any transboundary impacts. Inter-Relationships with Other Topics

18.9.2 The impact assessment to be undertaken for commercial and recreational navigation will reflect the findings of **Chapter 16 Estuarine Processes** (specifically with regard to the potential for maintenance dredging during the operational phase of the proposed scheme and the potential implications on existing vessel traffic within The Haven).

18.9.3 There are also inter-relationships with **Chapter 10 Noise and Vibration** and **Chapter 14 Air Quality** with regard to the environmental impact of vessel movements during the construction and operation of the Facility which will be discussed within the ES chapter.

### 18.10 Interactions

18.10.1 The impacts identified above have the potential to interact with each other, which could give rise to synergistic impacts because of that interaction. Interactions between different navigational impacts will be reported within the ES, following completion of the NRA.

## 18.11 References

Boston Belle (2018). Boston Belle River and Sea Trips. Available at: <http://www.bostonbelle.co.uk/>. [Accessed on: 10/11/2018].

Boston Borough Council (1999). Local Plan: Adopted Version. April 1999.

Boston Borough Council (2006). Boston Borough Interim Plan (Non-Statutory Development Control Policy). Available at: <http://93.93.220.238/localplan/> [Accessed: 04/02/2019].

Boston Borough Council (2007). Schedule of Policies contained in the Boston Borough Local Plan adopted April 1999 that are to be saved beyond the 27<sup>th</sup> September 2007. Available at: <http://www.boston.gov.uk/index.aspx?articleid=3736> [Accessed: 04/02/2019].

Department for Environment, Food and Rural Affairs (Defra) (2011). UK Marine Policy Statement. March 2011. London: HMSO.

Department for Environment, Food and Rural Affairs (Defra) (2014). East Inshore and East Offshore Marine Plans. April 2014.

Department for Transport (2012). National Policy Statement for Ports. January 2012.

Department for Transport (2018). Port and domestic waterborne freight statistics: data tables (PORT). Available at: <https://www.gov.uk/government/statistical-data-sets/port-and-domestic-waterborne-freight-statistics-port> [Accessed on: 10/11/2018]

Environment Agency (2016). Boston Barrier Tidal Project Environmental Statement: A17/2d – Volume 2d: Technical Report: Navigational Impact Assessment. August 2016.

Her Majesty's Stationary Office (HMSO)(1989). Statutory Instruments 1989 No. 2036 Harbours, Docks, Piers and Ferries, The Boston Harbour Revision Order 1989. London: HMSO.

Her Majesty's Stationary Office (HMSO) (1995). Merchant Shipping Act 1995.

Her Majesty's Stationary Office (HMSO) (2009). Marine and Coastal Access Act 2009.

International Maritime Organisation (1972). International Regulations for Preventing Collisions at Sea (COLREGs).

## Project Related

Marine Management Organisation (2019a). UK fishing vessel list as at 1<sup>st</sup> April 2019 – Over 10m overall length. Available at: <https://www.gov.uk/government/statistical-data-sets/vessel-lists-over-10-metres>. [Accessed on: 16/05/2019].

Marine Management Organisation (2019b). UK fishing vessel list as at 1<sup>st</sup> April 2019 – 10m and under overall length. Available at: <https://www.gov.uk/government/statistical-data-sets/vessel-lists-10-metres-and-under>. [Accessed on: 16/05/2019].

PIANC (2014). Harbour Approach Channels Design Guidelines, Report No. 121.

South-East Lincolnshire Joint Strategic Planning Committee (2017). South-East Lincolnshire Local Plan 2011-2036. Publication Version: March 2017.

The Planning Inspectorate (2018). Scoping Opinion: Proposed Boston Alternative Energy Facility. Case Reference: EN010095. July 2018.