REPORT

Boston Alternative Energy Facility – Environmental Statement

Chapter 24 Major Accidents and Risk Management

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Table of Contents

Table of Tables

Executive Summary

Major Accidents and risks for the proposed Boston Alternative Energy Facility (the Facility) are presented below. Many of these link to other chapters in the Environmental Statement (ES), including **Chapter 11 Contaminated Land, Land Use and Hydrogeology**, **Appendix 13.2 Flood Risk Assessment, Chapter 14 Air Quality** and **Chapter 18 Navigational Issues.**

The potential major accidents and risks identified include:

- Geophysical – landslide / instability;
- Tidal flooding and storm surges;
- Climatological – extreme temperatures (fire risk);
- Widespread electricity failure;
- Infrastructure failure; and
- Transport accidents (vessel to vessel collision and ship grounding).

Embedded mitigation measures will reduce these effects, which include flood defence and resilient design, land based dredging methodologies and general environmental best practice. In addition, the Code of Construction Practice will provide a mechanism by which the potential major accidents and risks during the construction phase of the Facility will be formally controlled and mitigated.

An Environmental Permit will be required for the operation of the Facility. The Environmental Permit application will include an Accident Prevention and Management Plan and Contingency Plans to minimise and prevent effects. A Fire Prevention Plan will also be included alongside the Environmental Permit. The Environmental Permit application will run in parallel with the determination of the Development Consent Order (DCO) application.

23 Major Accidents and Risk Management

23.1 Introduction

23.1.1 This chapter of the Environmental Statement (ES) describes the existing environment in relation to Major Accidents and Risk Management and provides the assessment of the potential impacts during the construction, operational and decommissioning phases of the Boston Alternative Energy Facility (the Facility). Mitigation measures are identified and where appropriate a discussion of the residual effects is provided where significant effects have been identified.

23.1.2 This chapter describes the baseline environmental information which is of relevance to Major Accidents and Risk Management for the Principal Application Site and identifies the construction, operational and decommissioning activities which could increase accidents and have an adverse effect on risk management. The Habitat Mitigation Area is not included within the assessment as the works are short term (up to one week), of small scale/nature and localised with negligible potential for significant effects relating to major accidents and risk.

23.1.3 This chapter relates to the following ES chapters: **Chapter 11 Contaminated Land, Land Use and Hydrogeology, Chapter 13 Surface Water, Flood Risk and Drainage Strategy, Appendix 13.2 Flood Risk Assessment, Chapter 14 Air Quality and Chapter 18 Navigational Issues.**

23.2 Legislation, Policy and Guidance

Legislation

23.2.1 There are various pieces of legislation applicable to Major Accidents and Risk Management. The following sections provide a summary of key pieces of International and UK legislation which are relevant to this chapter.

International Legislation

2014/52/EU Directive on the Assessment of the Effects of Certain Public and Private Projects on the Environment (European Parliament, 2014)

23.2.2 Paragraph 15 of the Recitals states

> *"in order to ensure a high level of protection of the environment, precautionary actions need to be taken for certain projects which, because of their vulnerability to major accidents, and/or natural disasters (such as flooding, sea level rise, or earthquakes) are likely to have significant adverse effects on the environment. For such*

projects, it is important to consider their vulnerability (exposure and resilience) to major accidents and/or disasters, the risk of those accidents and/or disasters occurring and the implications for the likelihood of significant adverse effects on the environment".

National Legislation and Policy

National Policy Statements

23.2.3 The policy framework for examining and determining applications for Nationally Significant Infrastructure Projects (NSIPs) is provided by National Policy Statements (NPSs). Section 104 of the Planning Act 2008 requires the Secretary of State to determine applications for NSIPs in accordance with any relevant NPS, unless:

- it would lead to the UK being in breach of its international obligations;
- it would be in breach of any statutory duty that applies to the Secretary of State;
- it would be unlawful;
- the adverse impacts of the development outweigh its benefits; or
- it would be contrary to any Regulations that may be made prescribing other relevant conditions.

23.2.4 In July 2011, the Secretary of State for the Department of Energy and Climate Change ('DECC' who's functions were replaced by the Department for Business, Energy and Industrial Strategy (BEIS)) designated a number of NPSs relating to nationally significant energy infrastructure.

23.2.5 The **Overarching National Policy Statement for Energy (EN-1)** (Department of Energy and Climate Change (DECC), 2011) is relevant to the Control of Major Accident Hazards (COMAH).

23.2.6 Paragraph 4.11.3 and 4.11.4 of **NPS EN-1** state that:

"Some energy infrastructure will be subject to the Control of Major Accident Hazards (COMAH) Regulations 1999. These Regulations aim to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any that do occur. COMAH regulations apply throughout the life cycle of the facility, i.e. from the design and build stage through to decommissioning. They are enforced by the Competent Authority comprising HSE and the EA acting jointly in England and Wales (and by the HSE and Scottish Environment Protection Agency acting

jointly in Scotland). The same principles apply here as for those set out in the previous section on pollution control and other environmental permitting regimes."
"Applicants seeking to develop infrastructure subject to the COMAH regulations should make early contact with the Competent Authority. If a safety report is required it is important to discuss with the Competent Authority the type of information that should be provided at the design and development stage, and what form this should take. This will enable the Competent Authority to review as much information as possible before construction begins, in order to assess whether the inherent features of the design are sufficient to prevent, control and mitigate major accidents. The IPC should be satisfied that an assessment has been done where required and that the Competent Authority has assessed that it meets the safety objectives described above."

23.2.7 The Facility is not anticipated to be considered a COMAH site because none of the hazardous substances used on the site will exceed the relevant COMAH thresholds.

National Planning Policy Framework (NPPF)

23.2.8 The NPPF was updated in February 2019 (Ministry of Housing, Communities and Local Government (MHCLG), 2019) and refers to accidents and risk assessment as follows:

"Local planning authorities should consult the appropriate bodies when considering applications for the siting of, or changes to, major hazard sites, installations or pipelines, or for development around them."

Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

23.2.9 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 states under Regulation 5, part 4 that

"The significant effects to be identified, described and assessed under paragraph (2) include, where relevant, the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that development."

23.2.10 Schedule 4, part 8 requires

> *"A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned.".*

Health and Safety at Work Act 1974

23.2.11 The Health and Safety at Work Act 1974 governs workplace health and safety in the United Kingdom. The Act sets out various obligations aimed at ensuring that reasonable and practical measures have been take so that people are not exposed to risks to their health and safety. The Health and Safety Executive, along with local authorities, are responsible for enforcing the Health and Safety at Work Act 1974. The relevance to major accidents and disasters is related to the management of major hazards under the Health and Safety at Work Act 1974.

Construction Design and Management (CDM) Regulations 2015

23.2.12 The CDM Regulations 2015 place specific duties on clients, designers and contractors for the management of health and safety to ensure adequate consideration of requirements is given throughout the development of the Facility.

Control of Major Accident Hazards (COMAH) Regulations 2015

23.2.13 The COMAH Regulations aim to prevent and mitigate the effects of major accidents involving dangerous substances which can cause serious damage/ harm to people and/ or the environment.

23.2.14 The Facility is likely to store and use several substances at quantities which although are hazardous substances, they do not exceed the relevant COMAH thresholds (for example, fuel oil). Therefore, the site would not be considered a COMAH site and would not require a Hazardous Substances Consent. However, the environmental permit will require procedures to control risks in a major accident prevention policy (MAPP).

Local Planning Policy

23.2.15 The Application Site falls within the following local authority boundaries:

- Lincolnshire County Council (LCC); and
- Boston Borough Council (BBC).

South-East Lincolnshire Local Plan

23.2.16 The South-East Lincolnshire Local Plan was adopted in March 2019 and outlines the policies which will help shape the growth of Boston Borough (and South Holland District) from 2011 – 2036 (South-East Lincolnshire Joint Strategic Planning Committee, 2019). The Local Plan includes the following policy of relevance to accidents and risk management:

> *"**Policy 30: Pollution***
>
> *Development proposals will not be permitted where, taking account of any proposed mitigation measures, they would lead to unacceptable adverse impacts upon:*
>
> *1. health and safety of the public;*
>
> *2. the amenities of the area; or*
>
> *3. the natural, historic and built environment;*
>
> *by way of:*
>
> *4. air quality, including fumes and odour;*
>
> *5. noise including vibration;*
>
> *6. light levels;*
>
> *7. land quality and condition; or*
>
> *8. surface and groundwater quality."*

Guidance

Annex G – The Health and Safety Executive to Advice Note Eleven: Working with public bodies in the infrastructure planning process

23.2.17 Annex G – The Health and Safety Executive (HSE) supplements the Planning Inspectorate's Advice Note Eleven: Working with public bodies in the infrastructure planning process and explains HSE's role in infrastructure planning. This annex states that the two main considerations for the HSE for the purposes of Nationally Significant Infrastructure Projects are:

- *Does the Proposed Development have the potential to cause a major accident; and*
- *Is the Proposed Development vulnerable to potential major accidents?*

23.2.18 This chapter addresses these questions on the vulnerability of the Facility to major accidents and the potential for major accidents **Section 23.6** and **23.7**, respectively.

23.3 Consultation

23.3.1 Consultation undertaken through the pre-application phase informed the approach and the information provided in this chapter. A summary of the consultation relevant to accidents and risk management is detailed in **Table 23-1**. Full details of the project consultation process are presented within **Chapter 7 Consultation**.

Table 23-1 Consultation and Responses

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
The Planning Inspectorate, July 2018	The Scoping Report includes Section 7.3 'Risks of Major Accidental Events', stating that this issue is intended to be scoped out of the ES. The Inspectorate advises that this section does not contain adequate information to allow agreement to scope this issue out at this stage. Specifically, not all of the matters required by the EIA Regulations pertaining to Major Accidents and Disasters have been addressed in the Scoping Report (see below). The Inspectorate welcomes the intention to include a risk assessment in the ES and considers that this may be an appropriate mechanism by which to present the necessary information. The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The Applicant should make use of appropriate guidance (e.g. that referenced in the Health and Safety Executive's (HSE) Annex to Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards. The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster as well as, in the case of Section 7.3 of the Scoping Report, the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage or the environment. Any measures that will	Relevant legislation applicable to this chapter is discussed in **Section 23.2**. Details of potential impacts and mitigation measures during construction and operation are shown in **Section 23.7**.

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
	be employed to prevent and control significant effects should be presented in the ES. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.	
	Risks of Major Accidental Events The Inspectorate advises that insufficient information has been provided to allow agreement to scope this issue out at this stage. The ES should include an assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster as well as, the Proposed Development's potential to cause an accident or disaster. Any measures that will be employed to prevent and control significant effects should be presented in the ES. Sections 3.3.15 to 3.3.17 of this Opinion provide further comment. In particular, given the nature of the Proposed Development the Inspectorate considers that there may be risk of a major fire associated with the feedstock storage. The Proposed Development may also be vulnerable to tidal surge or other flooding events. The assessment should consider these matters and assess the potential significant effects.	Details of potential impacts and mitigation measures during construction and operation are shown in **Section 23.7**. **Table 23-9** describes the potential major accidents and risks including fire risk and tidal flooding.
	Paragraph 7.3 – Risk of Major Accidental Events Waste sites and those storing large amounts of RDF in particular, are a significant fire risk. There have been a number of large fires in Lincolnshire at waste facilities and for this reason these sites are seen as an elevated risk of a major fire. The Council therefore does not agree that the risk of a major accidental event is not a non-significant EIA and should be included in the Environmental Statement considering the risk of fire and what measures will be adopted to mitigate this and what measures will be put in	**Table 23-9** describes the potential major accidents and risks including fire risk. A Fire Prevention Plan will be prepared as part of the Environmental Permit for the Facility.

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
	place to deal with a fire should this occur.	
	Risk of Major Accidents and Disasters Relevant to the Project Section 7.3 of the Scoping Report states that the impacts to the environment from a major accident or disaster can be scoped out of the ES. The MMO would expect to see a full consideration in the ES, of how the surrounding environment would be impacted should a major accident/disaster, which is not within AUBP control, destroy or damage the facility, for example as a result of a tidal surge.	Details of potential impacts and mitigation measures during construction and operation are shown in **Section 23.7**. **Table 23-9** describes the potential major accidents and risks including tidal flooding.
	Within the EIA PHE would expect to see information about how the promoter would respond to accidents with potential off-site emissions e.g. flooding or fires, spills, leaks or releases off-site. Assessment of accidents should: identify all potential hazards in relation to construction, operation and decommissioning; include an assessment of the risks posed; and identify risk management measures and contingency actions that will be employed in the event of an accident in order to mitigate off-site effects. The EIA should include consideration of the COMAH Regulations (Control of Major Accident Hazards) and the Major Accident Off-Site Emergency Plan (Management of Waste from Extractive Industries) (England and Wales) Regulations 2009: both in terms of their applicability to the installation itself, and the installation's potential to impact on, or be impacted by, any nearby installations themselves subject to the Regulations. There is evidence that, in some cases, perception of risk may have a greater impact on health than the hazard itself. A 2009 report, jointly published by Liverpool John Moores University and the HPA, examined health risk perception and environmental problems using a number of case studies. As a point to consider, the report suggested: "Estimation of community anxiety and stress should be included as part of every risk or impact assessment of proposed plans that involve a potential environmental hazard. This is true even when the physical health risks may be negligible." PHE supports the inclusion of this information within EIAs as good practice.	Details of potential impacts and mitigation measures during construction and operation are shown in **Section 23.7**. **Table 23-9** describes the potential major accidents and risks including potential off-site emissions. The Facility is not a COMAH site. The Facility is not extracting any minerals, nor is part of the extractive industry. Point noted. A Health impact assessment is provided in **Chapter 22 Heath.**
Section 42 Consultation	According to HSE's records there are no major accident hazard sites or major accident hazard pipelines within the	Noted.

Consultee and Date	Response	Chapter Section Where Consultation Comment is Addressed
Response – Health and Safety Executive (HSE), 31st July 2019	proposed redline boundary of the allocated waste area and the indicative boundary for the Boston Gasification Plant for this NSIP. This is based on the indicative red line boundary as illustrated in, for example, the phase three public information booklet	
	HSE would not advise against this proposal.	Noted.
	Explosives Sites HSE has no comment to make as there are no licenced explosive sites in the vicinity.	Noted.
	Electrical Safety No comment from a planning perspective.	Noted.
Section 42 Consultation Response – Lincolnshire Wildlife Trust, 6th August 2019	The incident / emergency response plan. This should detail what actions will be taken to ensure protection of terrestrial, freshwater and marine habitats and species in various incident and emergency scenarios. We consider that this should be reviewed by the conservation organisations, including Lincolnshire Wildlife Trust, before these are signed off.	An incident response plan will be prepared as part of the environmental permit application; and procedures for responding to incidents and emergencies will be incorporated into the Code of Construction Practice (CoCP) as described in **Section 23.7.**
Health and Safety Executive (HSE), 4th September 2020	Will the proposed development fall within any of HSE's consultation distances? According to HSE's records there are no major accident hazard sites or major accident hazard pipelines within the proposed redline boundary of the allocated waste area and the indicative boundary for the Boston Gasification Plant for this nationally significant infrastructure project. This is based on the indicative red line boundary as illustrated in, for example, the phase three public information booklet. HSE would not advise against this proposal.	This comment has been noted. There no operations regulated under the COMAH regime within 1 km of the site.

23.4 Assessment Methodology

23.4.1 **Chapter 6 Approach to EIA** provides the general assessment approach adopted for this EIA. In order to assess major accidents and disasters, a list of potential accidents and risks are identified along with potential receptors, and then the likelihood of an occurrence are considered to evaluate the significance of potential effects.

23.4.2 Impacts identified are considered by a detailed assessment of the potential for major accidents and disasters in relation to the Facility. The detailed assessment considers the Facility, design and embedded mitigation. These factors are compared to the baseline and where appropriate redesign / further mitigation requirements were recommended to be incorporated into the Facility.

23.4.3 The detailed assessment considers the potential hazards scoped in from the initial list to identify the following requirements:

- Their cause of the potential hazard is within the Principal Application Site;
- Interaction with the proposed construction, operational and / or decommissioning stages of the Facility; and
- Receptors at risk from the hazards are present in the Principal Application Site.

23.4.4 The potential for identified relevant major accident and / or disaster events to result in a significant adverse environmental effect are evaluated using a 'source, pathway and receptor' based approach to risk. This approach considers the environmental consequences of a major accident or disaster occurring, the likelihood of these consequences occurring, taking into account planned design and embedded mitigation, and the acceptability of the subsequent risk to the environment. The process uses the following approach:

- Identification of potential major accident and disaster hazards and receptors;
- Screening of risks; and
- Evaluation of significance.

Evaluation of Significant Effects

23.4.5 There is no industry standard approach to the assessment of major accidents and disasters. The approach in this assessment uses a combination of the magnitude and likelihood as this is the emerging industry standard for assessing major accidents and disasters.

Magnitude of effects

23.4.6 The magnitude of change considered for major accidents and disasters is the severity of harm / damage (hazard) and the duration of exposure. This considers the resistance and resilience of receptors.

23.4.7 The severity of major accidents and disaster hazards is considered using a threshold-based approach. This develops the approach used during the scoping stage to determine if hazards should be assessed further. The thresholds used are developed for human receptors from HSE's Reducing risks, protecting people 'R2P2' guidance (HSE, 2001), and for the environment CDOIF (Chemical and Downstream Oil Industries Forum) guidance (CDOIF, 2015). The severity of harm and duration of harm criteria adopted in the assessment is derived from the above guidance and presented in **Table 23-2** and **Table 23-3**.

Table 23-2 Severity of Harm Definitions

Receptor Type	Receptor Sensitivity	Severity of Harm			
		Not Significant	Severe	Major	Catastrophic
Populations (construction workers, operational workers, off-site residents / commercial workers)	Very high	Substantial number of people requiring medical attention.	Multiple life changing injuries.	Multiple life changing injuries, potential loss of life in low numbers.	Potential loss of life in high numbers and substantial number of life changing injuries.
Designated Land/Water Sites (Nationally important: SSSI and National Nature Reserves (NNR))*	High	<0.5 hectares or <10 %	10 % >0.5 hectares or 10-50 % of site area, associated linear feature or population	>50 % of site area, associated linear feature population	N/A
Designated Land/Water Sites (Internationally important: SACs, SPAs & Ramsar sites)*	Very high	<0.5 hectares or <5 % (<5 % LF/Pop)	>0.5 hectares or 5-25 % of site area or 5-25 % of associated linear feature or population	25-50 % of site area, associated linear feature or population	>50% of site area, associated linear feature or population
Other Designated Land (ESA's, AONB's LNRs, NSA's etc)*	High	<10 hectares or <10 %	10-100 hectares or 10-50 % of land	>100 hectares or >50 % of land	N/A
Scarce Habitat*	Medium/high	<2 hectares or <10 %	2-20 hectares or 10-50 % of habitat	>20 hectares or >50 % of habitat	N/A

Receptor Type	Receptor Sensitivity	Severity of Harm			
		Not Significant	Severe	Major	Catastrophic
Widespread Habitat – Non-designated Land*	Medium	<10 hectares	Contamination of 10-100 ha of land, preventing growing of crops, grazing of domestic animals or renders the area inaccessible to the public because of possible skin contact with dangerous substances. Alternatively, contamination of 10 hectares or more of vacant land.	100 – 1,000 hectares (applied as per text under 'Severe')	>1,000 hectares (applied as per text under 'Severe')
Widespread Habitat – Non-designated Water*	Medium	N/A	Contamination of aquatic habitat that prevents fishing or aquaculture or renders it inaccessible to the public.	N/A	N/A
Groundwater Source of Public or Private Drinking Water*	Very high	High Interruption of drinking water supply <1,000 person-hours; or	Interruption of drinking water supplied from a ground or surface	>1 x 107 person-hours interruption of drinking water (a town of	>1 x 109 person-hours interruption of drinking (~1 million people losing

Receptor Type	Receptor Sensitivity	Severity of Harm			
		Not Significant	Severe	Major	Catastrophic
		for England & Wales only <1 hectares Source Protection Zone (SPZ).	source (where persons affected x duration in hours [at least 2] >1,000 and <=1 x 107 person hours); or for England & Wales only 1-10 hectares of SPZ where drinking water standards are breached.	~100,000 people losing supply for month) and <=1 x 109 person hours; Or for England & Wales only 10 - 100 hectares SPZ drinking water standards breached.	supply for one month); or for England & Wales only >100 hectares SPZ drinking water standards breached.
Groundwater Non-drinking Water Source*	Medium/high	<1 hectare	1-100 hectares of aquifer where water quality standards are breached (or hazardous substance is discernible).	100-10,000 hectares	>10,000 hectares
Groundwater in unproductive strata*	Low	Not applicable. Groundwater is considered a pathway to another receptor.	N/A		

Receptor Type	Receptor Sensitivity	Severity of Harm			
		Not Significant	Severe	Major	Catastrophic
Soil or sediment (i.e. as receptor rather than purely a pathway)*	Low to medium	Contamination not leading to environmental damage (as per Environmental Liability Directive (ELD)), or not significantly, affecting overlying water quality.	Contamination of 10-100 hectares of land etc. as per Widespread Habitat; contamination sufficient to be deemed environmental damage (ELD).	Contamination of 100-1,000 hectares of land, as per Widespread Habitat; contamination rendering the soil immediately hazardous to humans (e.g. skin contact) or the living environment, but remediation available.	Contamination of >1,000 hectares of land, as per Widespread Habitat; contamination rendering the soil immediately hazardous to humans (e.g. skin contact) or the living environment and remediation difficult or impossible.
Built environment* Under CDOIF built environment is limited to Grade 1/Cat A listed buildings, Scheduled Monuments, Conservation Areas and receptors of higher sensitivity.	Medium to very high (depending on the designation and nature of a designated sites)	Damage below a level at which designation of importance would be withdrawn.	Damage sufficient for designation of importance to be withdrawn.	Feature of built environment subject to designation of importance entirely destroyed.	N/A

Receptor Type	Receptor Sensitivity	Severity of Harm			
		Not Significant	Severe	Major	Catastrophic
Particular species (Note - these criteria apply nationally not regionally/locally)*	Low to very high/high (depending on species)	Loss of <1 % of animal or <5 % of plant ground cover in a habitat.	Loss of 1-10 % of animal or 5-50 % of plant ground cover.	Loss of 10-90 % of animal or 50-90 % of plant ground cover.	Total loss (>90 %) of animal or plant ground cover.
Marine*	Medium	<2 hectares littoral or sublittoral zone, <100 hectares of open sea benthic community, <100 dead sea birds (<500 gulls), <5 dead/significantly impaired sea mammals.	2-20 hectares littoral or sub-littoral zone, 100-1,000 hectares of open sea benthic community,100-1,000 dead sea birds (500-5,000 gulls), 5-50 dead/significantly impaired sea mammals.	20-200 hectares littoral or sub-littoral zone, 100-10,000 hectares of open sea benthic community, 1,000-10,000 dead sea birds (5,000-50,000 gulls), 50-500 dead/significantly impaired sea mammals.	>200 hectares littoral and sub-littoral zone, >1,000 hectares of open sea benthic community, >10,000 dead sea birds (>50,000 gulls), >500 dead/significantly impaired sea mammals.
Fresh and estuarine water habitats*	High	Impact below that indicated to be severe.	WFD Chemical or ecological status lowered by one class for 2-10 km of watercourse or 2-20 hectares or 10-50 % area of estuaries or ponds. Plus, interruption of drinking	WFD Chemical ecological status lowered by one class for 10-200 km of watercourse or 20-200 hectares or 50-90 % area of estuaries and ponds. Plus, interruption	WFD Chemical or ecological status lowered by one class for >200 km of watercourse or >200 hectares or >90 % area of estuaries and ponds. Plus, interruption of drinking water

Receptor Type	Receptor Sensitivity	Severity of Harm			
		Not Significant	Severe	Major	Catastrophic
			supplies, as per Groundwater Source of Drinking Water.	of drinking water supplies, as per Groundwater Source of Drinking Water.	supplies, as per Groundwater Source of Drinking Water.

*Criteria and receptor types extracted directly from CDOIF Criteria.

** While this level of impact is important, and may lead to significant pollution, it does not constitute the threshold of Major Accident and Disaster

Table 23-3 Duration of Harm Criteria

Description	Short term	Medium term	Long term	Very long term
Populations	N/A	Low to high numbers affected (10s of people).	Very high number affected (100s of people).	
Groundwater or surface water drinking water source (public or private)	N/A	N/A	A harm affecting drinking water source or SPZ < 6 years.	A harm affecting drinking water source or SPZ > 6 years.
Groundwater (except drinking water sources): WFD Hazardous/Non-Hazardous Substances	WFD hazardous substances < 3 months.	WFD hazardous substances > 3 months.	WFD hazardous substances > 6 years.	WFD hazardous substances > 20 years.
	WFD non-hazardous substances < 1 year.	WFD non-hazardous substances > 1 year.	WFD non-hazardous substances > 10 years.	WFD non-hazardous substances > 20 years.
Surface water (except drinking water sources - see above)	< 1 year	> 1 year	> 10 years	> 20 years
Land	< 3 years	> 3 years or > 2 growing seasons for agricultural land.	> 20 years	> 50 years
Built environment	Can be repaired in < 3 years, such that its designation can be reinstated.	Can be repaired in > 3 years, such that its designation can be reinstated.	Feature destroyed, cannot be rebuilt, all features except world heritage site.	Feature destroyed, cannot be rebuilt, including world heritage site.

23.4.8 The magnitude for assessment considers the severity of each major accident or disaster hazard and the duration to establish the magnitude of change likely to occur. The details of this matrix are outlined in **Table 23-4**.

Table 23-4 Magnitude of Change Matrix

Hazard Severity	Duration of effect			
	Short	Medium	Long	Permanent
Catastrophic	Scoped out	High	Very High	Very High
Major		Medium	High	Very High
Severe		Low	Medium	High
Not significant		Scoped out of the assessment		

Likelihood

23.4.9 The evaluation of significance relates to the likelihood of occurrence and tolerability of the risk. The definitions used for likelihood are designed to be cognisant of HSE's R2P2 guidance (HSE, 2001) for societal risk, and CDOIF guidance (CDOIF, 2015) for environmental tolerability. Risk tolerability for major accidents and disasters in the UK generally falls under the principle "ALARP" meaning as low as reasonably practicable. For major accidents and disaster assessments this means that intolerable risk should be eliminated, and residual risk should be reduced where practicable. For the EIA the definition of intolerable risk is interpreted as meaning significant adverse effects.

23.4.10 Likelihood of effect considers the plausibility and probability of an effect, with a likely effect being both plausible and probable.

- Plausible relates to their being a relevant source, pathway and receptor (see discussion of health pathways below); and
- Probable relates to a qualitative judgement to exclude those effects that could only occur under certain very rare conditions, except where these relate to the Facility's vulnerability to major accidents or disasters (as required by EIA Regulations 2017).

23.4.11 For the purpose of EIA, 'major' and 'moderate' adverse effects are deemed to be significant (in EIA terms), and as such may require mitigation. Whilst minor effects are not significant in their own right, it is important to distinguish them from other non-significant (negligible) effects as they may contribute to significant effects cumulatively or through interactions.

23.4.12 The effect significance matrix used in this assessment is shown in **Table 23-5**.

Table 23-5 Significance of Effect

Magnitude	Likelihood to Occur			
	Reasonably Likely	Unlikely	Very Unlikely	Extremely unlikely
	Reasonable likelihood/possibility at the development over its lifetime	Unlikely/small possibility at the development over its lifetime	Remote possibility at the development over its lifetime	Highly Improbable even in the very long term
Very High	Major	Major	Moderate	Minor
High	Major	Moderate	Minor	Minor
Medium	Moderate	Minor	Minor	Negligible
Low	Minor	Minor	Negligible	Negligible

Cumulative Impact Assessment

23.4.13 For an introduction to the methodology used for the Cumulative Impact Assessment (CIA), please refer to **Chapter 6 Approach to EIA**. This chapter includes those cumulative impacts that are specific to Accident and Risk Management.

Transboundary Impact Assessment

23.4.14 There are no transboundary impacts with regards to Accidents and Risk Management because the proposed infrastructure is not sited near any international boundaries.

23.5 Scope

Study Area

23.5.1 The development footprint is referred to hereafter as 'the Principal Application Site' and is shown on **Figure 1.1**.

23.5.2 A full description of, and associated information for, the Application Site is provided in **Chapter 5 Project Description**.

Data Sources

23.5.3 The assessment was undertaken with reference to several sources, as detailed in **Table 23-6**.

Table 23-6 Key Information Sources

Data	Source	Year	Confidence[1]
National Risk Register of Civil Emergencies.	Cabinet Office	2017	High
Potential external major accidents and natural disasters identified by Lincolnshire's Resilience Forum.	Community Risk Register for Lincolnshire	2018 - 2021	High
Major Accident Reporting (eMARS).	European Commission	2018	High
Weather and Climate Data	Met Office	2020	High

Assumptions and Limitations

23.5.4 There is no specific guidance on the methodology to progress a major accident and disaster risk assessment, therefore the approach draws upon guidance from a range of sources as previously detailed in this chapter. The assessment is also dependent on information from other technical assessments within the ES which utilise third party data, as well as information from other sources, also previously detailed in this chapter. The third-party information is taken at face value and no further check or validation of this information has been made.

23.6 Existing Environment

23.6.1 The existing environment described below draws on the findings of the technical assessments within the ES, in addition to the information gathered during the desk based review conducted as part of this chapter. This information has been used to understand the conditions at, and in the vicinity of, the Facility that influence the effects of major accidents and disasters and the vulnerability of receptors.

Table 23-7 Existing Environment

Hazard	Activity	Baseline
Geophysical	Earthquake	The Facility is located in an area of low seismicity. The BGS seismic hazard map for the UK indicates a Peak Ground Acceleration (PGA; "g") of 0.02-0.04 for the Facility, which is considered to be low in comparison to the rest of the UK and negligible in comparison to the rest of the world.

[1] *Confidence level based upon professional judgement taking into account the type, quality and organisation responsible for collating the data sources*

Hazard	Activity	Baseline
		Damaging earthquakes in the UK are very rare, the BGS carries out seismic monitoring across the UK and on average records approximately 100 earthquakes per year, of which 20 are actually noted by the public each year. The potential damage caused by these events is unlikely to be of the severity or nature observed in other regions of the globe where major infrastructural damage is observed and reported. The UK has had no significant earthquakes occur within the past decade, with the most significant being a 5.2 ML magnitude earthquake in Market Rasen, Lincolnshire on the 27 February 2008. This was the largest earthquake in the UK since a magnitude 5.4 ML earthquake in North Wales in 1984 (BGS, 2011). However, as this area is in an area of low seismicity, the likelihood of occurrence is low. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Landslides/ instability	The Facility is not located within a coal mining affected area. Information from the BGS and presented in the Envirocheck Report (**Appendix 11.1 Land Quality Phase 1 Preliminary Risk Assessment**) indicates the following: The potential for collapsible ground stability hazards is 'no hazard'; The potential for compressible ground stability hazards is a 'moderate' hazard[2]; The potential for ground dissolution stability hazards is 'no hazard'; The potential for landslide ground stability hazards is 'very low' to 'low'; The potential for running sand ground stability hazards is 'moderate'[3]; and The potential for shrinking or swelling clay ground stability hazards is 'low'. The available BGS online records do not appear to show that the study area is at risk from land instability and landslides. Due to the moderate hazards of compressible ground and running sand ground stability this hazard is **scoped in.**
	Tsunami	The Facility is not located within an identified tsunamis risk zone (European Spatial Planning Observation

[2] *Further detail on compressible ground: https://www.bgs.ac.uk/products/geosure/compressible.html*
[3] *Further detail on running sand ground stability hazards: https://www.bgs.ac.uk/products/geosure/running_sand.html*

Hazard	Activity	Baseline
		Network, Espon 2005 Europe: Tsunamis hazard map). The likelihood of occurrence is low and the potential future changes to the baseline are also low. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Volcanic eruption	There are two types of volcanic eruption included in the Government's National Risk Register for Civil Emergencies. Firstly, Icelandic style (gas rich eruptions – "explosive" eruptions) and secondly "effusive" eruptions. Explosive eruptions are characterised as eruptions causing large ash clouds and disruption to air travel. Effusive eruptions cause long term alterations to air quality and are associated with impacts to human health and crops. Neither are likely to effect the construction or operation of the Facility; therefore, this hazard has been **scoped out** and is not considered further in this assessment.
Hydrological	Avalanche	Avalanche hazards for the Facility were considered unlikely because the study area is not located in an area of potential avalanche hazard, as identified on the ESPON 2004 European: avalanche hazard map. The only avalanche hazards identified are in the highlands of Scotland. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Coastal flooding	The hydrological baseline of the Facility is outlined in detail within **Chapter 13 Surface Water, Flood Risk and Drainage Strategy**. As the Facility is upstream of the Wash it will not be directly impacted by coastal flooding. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Tidal Flooding	As discussed in **Appendix 13.2,** the Facility is located on the western bank of the Haven and is located in Flood Zone 3. The residual risk of tidal flooding to the Facility is medium to low due to the presence of defences, which are classed as being in 'good' condition. These defences will be maintained by provision of an increased height of flood protection provided by the wharf. This hazard has been **scoped in** to the assessment.
	Fluvial flooding	The fluvial flood risk to the Facility is outlined within **Appendix 13.2**. The Environment Agency has confirmed that the classification of Flood Zone 3 is in

Hazard	Activity	Baseline
		relation to tidal flood risk rather than fluvial. The risk of flooding from fluvial sources is considered to be low. This hazard has therefore been **scoped out** and is not considered further in this assessment.
Climatological	Drought	**Chapter 22 Climate Change** sets out the climate baseline for the Facility. Over the past 40 years or so England has experienced five long-duration droughts and two shorter periods of drought. Severe drought can lead to high levels of dust in the air which reduces visibility. The Facility would have a low vulnerability to drought conditions according to **Chapter 22 Climate Change**, therefore this has been **scoped out** of the assessment.
	Extreme temperatures	**Chapter 22 Climate Change** sets out the climate baseline for the Facility. Low temperatures tend to lead to an increase in slips, trips and falls, whereas high temperatures can cause health problems (particularly cardio-respiratory conditions) for vulnerable personnel. Both high and low temperatures can impact on staff productivity. Temperature extremes also affect operating costs as heating and cooling demand responds to cope, with an associated impact on energy costs. Extreme low temperatures that lead to snow and ice events are likely to decrease at the Facility over time. The UK has experienced multiple high temperature events and heatwaves in recent years. A major heatwave hit the UK in 1976 when there were 18 consecutive days of temperatures surpassing 30°C. Notable other heatwaves have occurred in the UK in 1995, 2003, 2006 and in 2018, where at least nine consecutive days of temperatures surpassing 30°C were recorded. The UK's highest temperature of 38.7°C was recorded in July 2019, exceeding the previous record of 38.5°C recorded in 2003. According to the Met Office we are experiencing higher maximum temperatures and longer warmer spells (Met Office, 2017). This hazard has been **scoped in** to the assessment.
	Wildfire	**Chapter 22 Climate Change** sets out the climate baseline for the Facility. Hot, dry and windy weather are ideal conditions for wildfires to start and spread. Such weather tends to be

Hazard	Activity	Baseline
		relatively short-lived but is most likely to occur between March and May, and between July and September. In years where there has been a significant drought the number of wildfires usually rises significantly. This risk is also affected by the availability and dryness of fuel (e.g. vegetation). Fire events are likely to increase over time, as a result of increased temperatures and reduced rainfall during summer months. Due to the location of the Facility at Riverside Industrial Estate, wildfires are unlikely, therefore this hazard has been **scoped out** and is not considered further in this assessment.
Meteorological	Heavy snow and extreme cold	**Chapter 22 Climate Change** sets out the climate baseline for the Facility. The UK sits in the path of predominantly westerly winds where low-pressure systems frequently move across the UK bringing unsettled weather including sub-zero temperatures and snow. In 2001 heavy snow caused travel disruption for up to five days and brought down power lines across Northern Ireland. The most widespread and prolonged low temperatures and heavy snow in recent years occurred from December 2009 to January 2010, with sub-zero daytime temperatures across the UK. At night temperatures regularly dropped to -5˚C to -10˚C. Snow fall lasted for some time resulting in a build-up of 20 cm to 30 cm. Heavy snow and extreme cold is unlikely to cause any major accidents or risks at the Facility, this hazard has been **scoped out** and is not considered further in this assessment.
	Hurricanes and storms	The UK sits in the path of predominantly westerly winds where low-pressure systems frequently move across the UK. The aftermath of hurricanes also sometimes affects the UK. This brings unsettled weather including winds and possible lightning. According to the Met Office, Eastern England is one of the most sheltered parts of the UK, since the windiest areas are to the north and west. (Met Office, 2016). Storm conditions are unlikely to cause any major risks to the Facility; therefore, this hazard has been **scoped out** and is not considered further in this assessment.
	Severe space weather	Space weather events predominately relate to variations in solar activity. Solar activity occurs on different cycles

Hazard	Activity	Baseline
		leading to solar events occurring with varying likelihood. Low severity events occur on a cycle with an increased frequency and therefore likelihood of occurrence. The severity and type of event most relevant to a major hazard or accident occurring have a low likelihood of occurrence. Space weather is monitored and therefore can be forecast similar to other weather events. This allows for mitigation to be put into place before any effects are felt. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Storm surge	The hydrological baseline of the Facility is discussed in **Chapter 13 Surface Water, Flood Risk and Drainage Strategy**. The Facility is located adjacent to the Haven and has the potential to be affected by tidal flooding and storm surge. This hazard has been **scoped in** to the assessment.
	Poor air quality	The air quality baseline of the Facility is outlined in **Chapter 14 Air Quality**. The Facility is not located in an area where poor air quality occurs as a result of natural phenomena. This hazard has therefore been **scoped out** and is not considered further in this assessment.
Biological	Infectious disease epidemics and pandemic	Human diseases take a variety of forms, some of which have the potential to cause a civil emergency due to the number of people they might affect in a short space of time. One such risk is an influenza ('flu') pandemic. Flu pandemics are natural events that happen when a unique flu virus evolves that few people (if any) are immune to. In a pandemic, the new virus will spread quickly and cause more serious illness in a large proportion of the population, due to the lack of immunity. There is a high probability of a flu pandemic occurring, but it is impossible to predict when. The most recent pandemic is the COVID-19 pandemic which is currently ongoing and has caused disruptions to businesses and organisations across the UK and the world. Emerging infectious diseases could also cause large numbers of people to fall ill. These are diseases which have recently been recognised or where cases have increased over the last 20 years in a specific place or among a specific population (e.g. the Zika virus).

Hazard	Activity	Baseline
		This hazard has been **scoped out** and is not considered further in this assessment. The current COVID-19 pandemic has led to guidance produced by the UK Government to ensure workplaces are COVID secure and operations will not be impacted. If necessary (at the time of construction/ operation), these precautions will be put in place at the Facility.
	Infectious animal disease epidemics and pandemics	Animal diseases threaten the UK for two main reasons: firstly, because of the potential for some diseases to spread from animals to humans and cause illness or fatalities; and secondly, because they affect the animals on which we rely for food, trade, or to maintain the ecosystem. This is unlikely to effect the construction or operation of the Facility; therefore, this hazard has been **scoped out** and is not considered further in this assessment.
	Animal plagues and pests (introduction of invasive species)	An invasive species is a species that is not native to a specific location and has a tendency to spread to a degree believed to cause damage to the environment, human economy or human health. The UK has a number of examples including: • Grey Squirrels • Himalayan Balsam • Japanese Knotweed • Giant Hogweed • Signal Crayfish • Beetles which resulted in the demise of the Dutch Elm • Ash die back caused by a fungus No invasive plant species were recorded within the survey area during the 2017 and 2018 Extended Phase 1 Habitat Surveys (see **Chapter 12 Terrestrial Ecology**). Consequently, this hazard has therefore been **scoped out** and is not considered further in this assessment.
Malicious	Industrial action	There are legal restrictions around how long strikes can last and in certain critical sectors (such as policing and for prison officers) striking is unlawful. Industrial action can lead to temporary closures, reduced services and disruption to organisations, customers and the general public. Services generally continue but at a reduced capacity. Consequences of industrial action may include:

Hazard	Activity	Baseline
		• disruption to essential services, particularly transport, health and education; • disruption to business (via lost working hours); • possible public order challenges (with associated pressure on policing); and • economic damage (particularly for transport sector industrial action). In the twenty-first century, there have been strikes in both the public and private sector by: fuel tanker drivers, firefighters, teachers, health service staff, London Underground workers, Government employees, and other groups of workers. Most recent industrial action and associated activity at picket lines has been peaceful. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Public disorder and civil unrest	Public disorder can take many forms, including rioting, looting, vandalism, violence and arson. Disorder is unpredictable and peaceful protests can escalate quickly when small numbers of individuals are intent on provoking violence. Disorder can be influenced by a variety of factors, such as a breakdown in community and police relations, or other community tensions. Public disorder may be caused by long-standing grievances or as a spontaneous response to a single incident. Peaceful protests are not considered a form of public disorder. Consequences of public disorder may include: • physical / psychological casualties; • disruption to critical services, particularly policing and health; • damage to property and infrastructure; • possible evacuation or temporary shelter requirements; and • possible economic damage. This is unlikely to be a hazard in Boston and has been **scoped out** and is not considered further in this assessment.
	Conflict and wars (including terrorist attack)	The UK faces a serious and sustained threat from terrorism.

Hazard	Activity	Baseline
		Islamist extremists continue to pose the most significant terrorist threat to the UK and to UK interests. Such groups include Daesh (also known as the so-called 'Islamic State', ISIL, and ISIS) in Iraq and Syria, Al Qa'ida (centred in Afghanistan and Pakistan), Al Shabaab (in Somalia), and Boko Haram (in Nigeria). Numerous Islamist extremist groups want to conduct terrorist attacks against the western world, including the UK. The return of experienced fighters to the UK and Europe from Syria increases this threat. Online radicalisation of impressionable individuals is a serious problem and allows Islamist extremist groups to recruit from inside western and other countries. Individuals may become radicalised by international groups but choose to conduct attacks independently without external contact. Northern Ireland-Related Terrorism is still a notable threat, with violent dissident republican groups intent on perpetrating attacks against (e.g.) the Police Service of Northern Ireland and prison officers. Violent far-right extremism is relatively infrequent in the UK but does happen. Such individuals and groups generally seek to target specific individuals, minorities and politically affiliated groups rather than the wider public. Transport systems include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. In the UK, conventional terrorist attacks on land and air-based transport are more likely than against maritime (water) transport. The likelihood of any of these things happening to an individual is still very low. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Cyber-attacks	Cyberspace is essential to our economy and society. The scale of our dependence on cyberspace means that our prosperity, key infrastructure, places of work and our homes can all be affected by cyber-attacks. Vulnerabilities can take time to identify and exploited systems can be used to attack other systems and networks, making culprits difficult to identify. Cyber-attacks occur almost constantly. Accurate estimates are difficult to determine but economic losses as a result of cyber-attacks are judged to be in the tens of billions of pounds. On average, there are 1,000 cyber security breaches a year for every UK business,

Hazard	Activity	Baseline
		distributed unevenly. The average business faces costs of £1,600 a year due to these breaches, falling only slightly to £1,400 a year even for micro and small businesses. Cyber-attack is unlikely to affect the Facility, however cyber security measures would be put in place and kept up to date to defend against cyber-attack. This hazard has therefore been **scoped out** and is not considered further in this assessment.
	Large and small-scale chemical, biological and conventional attacks	The Government works hard to prevent terrorists from gaining the expertise and materials necessary to deliver attacks employing chemical, biological, radiological or nuclear (CBRN) materials. Such attacks have the potential to cause harm by contaminating people, animals, buildings, outdoor environments, water supplies and food. Their scale and impacts could vary widely depending on the materials involved and the way they are used. Extremists remain interested in CBRN materials, however alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely. Smaller-scale incidents could include targeted releases of chemical, biological or radiological materials in indoor or outdoor environments, or assassination. Larger-scale incidents could include the widespread use of biological agents or an improvised nuclear device; resulting in much greater numbers of casualties and widespread, long-term impacts of a magnitude above all other terrorist attacks. Larger-scale attacks of this type have never happened before but would be more challenging to respond to due to the nature of the potential health impacts and widespread environmental contamination. While the likelihood of terrorists successfully conducting a larger-scale CBRN attack in the UK is highly unlikely, it cannot be ruled out. This hazard is unlikely to occur at the Facility and has therefore been **scoped out** and is not considered further in this assessment.
Major Accidents	Widespread electricity failure and infrastructure failures	Instances of electricity failure (also referred to as power loss or blackout) can be caused by events such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. Damage to the National Electricity Transmission System is much less common but could cause significant

Hazard	Activity	Baseline
		electricity disruption and, in extreme cases, a widespread loss of power. These failures could be local (e.g. a metropolitan area), regional (e.g. the midlands) or national (e.g. across much of the UK). An electricity failure across entire regions or the UK as a whole has not happened before. Were it to occur, impacts would be very severe, causing widespread disruption to many critical sectors and wider society in general. The National Grid has a recovery process called 'Black Start' to recover the network from a total or partial shutdown. Based on current plans, Black Start recovery could take up to five days with potential for some additional disruption beyond this timescale in the event of significant network damage. Therefore, this hazard has been **scoped in.**
	Transport accidents	The transport baseline of the Facility is outlined in **Chapter 19 Traffic and Transport**. Transport accidents occur across the UK daily, mainly on roads, and involving private vehicles. Well-practiced plans exist to deal with these locally. Large-scale transport accidents are very rare. Air - There have been no major air accidents in the UK since the Kegworth incident in 1989, when a Boeing 737 crashed close to the M1 motorway, resulting in 47 fatalities. A helicopter crashed in Vauxhall, London on 13 January 2013, resulting in the deaths of the pilot and a passer-by struck by falling debris. A helicopter lost power and crashed in Glasgow on 29 November 2013, resulting in 10 fatalities. On 22 August 2015, a Hawker Hunter crashed onto the A27 road while participating in an aerial display, resulting in 11 fatalities among people on the ground. On October 8th, 2014 an US Air Force F15-D came down in Weston Hills, Spalding, which is <20 miles from Boston, however, there were no fatalities. Road - Even the largest road incidents would be highly unlikely to warrant a coordinated Government or devolved administration response and would instead be managed by local authorities and the emergency services. The above hazards are unlikely to occur and have been **scoped out** and are not considered further in this assessment.

Hazard	Activity	Baseline
		Ship – Ship to ship collision occurs particularly in areas of intense ship traffic and offshore operations (Calle & Alves, 2011). There is a particular environmental impact where this causes oil spills. Grounding of ships blocking rivers and ports can also be a potential hazard. On 13 December 2,000 a cargo vessel called Lagik was grounded at Port Sutton Bridge on the River Nene which closed the port of Wisbech for 44 days. The incident caused some minor pollution to the River Nene. Therefore, this hazard is **scoped in** as there is the potential for collision risk or grounding of ships within the Haven.
	Industrial accidents	Industrial and urban accidents can take a wide variety of forms and their impacts vary considerably in both scale and nature. In some cases, these accidents will have very limited impacts beyond the immediate area and can be dealt with locally, although others can have cascading effects that will have a wider impact. This is a broad category of risk and includes: • fires and explosions (affecting, e.g. residential buildings, power plants, refineries or oil rigs); • chemical and biological contamination (such as oil spills or food contamination); • radiological contamination (from nuclear accidents in the UK or abroad); and • dam breach (leading to a sudden emptying of reservoirs and subsequent flooding). Fires - In December 2005 Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England, resulting in a number of injuries. The surrounding area was temporarily evacuated, and some local businesses experienced long-term disruption to operations. In October 2016 an explosion occurred at the BASF chemical company's Ludwigshafen HQ, Germany, resulting in three fatalities and 30 casualties. There are no explosive sites within 1 km of the Facility. Adjacent to the site is Biomass UK No. 3 Limited which is a gasification facility using shredded waste wood as

Hazard	Activity	Baseline
		feedstock. Biomass UK No. 3 Limited must comply with the Environment Agency permit (permit number EPR/UP3131DF) which includes measures such as taking appropriate measures to prevent fires (compliance with a Fire Prevention Plan). Chemical contamination - Shipping, especially tankers, presents the risk of oil or chemical pollution to the marine environment as a result of collision, grounding, sinking, structural failure, loss of cargo overboard or other marine accident. Lincolnshire is home to three major ports (Hull, Immingham and Grimsby) and is also home to offshore oil fields. To the east of the county is the North Sea which is one of the busiest trade routes in the world with more than 600 vessels per day. Within the UK, 95 % of trade in and out of the country is via the sea and fuels dominate this cargo. In January 2007 the MSC Napoli, a UK container ship was damaged by storm force winds in the English Channel and beached in Lyme Bay, Devon. There were five miles of oil spilled. Radiological contamination - Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the UK is extremely low. There are no registered radioactive substances within 1 km of the Facility. There no operations regulated under the COMAH regime within 1 km of the site. The Port of Boston have a planning hazardous substance consent for ammonium nitrate and ammonium nitrate compounds. As this is controlled by the hazardous substance consent it is not considered a risk. Overall, the risk of industrial accidents in the vicinity of the Facility is highly unlikely, therefore this has been **scoped out** of further assessment.

Potential Receptors

Table 23-8 Potential Receptors

Receptor	Baseline
Human health	The human health baseline is detailed in the population assessment (**Chapter 20 Socio-economics** and **Chapter 22 Health**). As discussed in **Chapter 20 Socio-economics**, the latest available data from the Office for National Statistics (ONS) (ONS, 2020) indicate that the population of the Area Of Impact in 2019 was 70,173. For the purpose of this chapter human health includes, residents, commercial workers and construction workers.
Biodiversity	Ecologically sensitive sites are detailed in **Chapter 12 Terrestrial Ecology** and **Chapter 17 Marine and Coastal Ecology**. Havenside Local Nature Reserve (LNR) is located approximately 140 m east of the survey area at its closest point on the eastern bank of The Haven (tidal River Witham). The Wash Special Protection Area (SPA), Ramsar Site, Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) is located approximately 3 km away from the location of the Facility at the closest point.
Water	The receptors considered for surface waters and groundwater are detailed within **Chapter 13 Surface Water, Flood Risk and Drainage Strategy** and **Chapter 11 Contaminated Land, Land Use and Hydrogeology**. Surface Water The eastern extent of the Facility directly adjoins the tidal River Witham. The tidal extent of the River Witham is known as The Haven, which starts from the Grand Sluice, to the mouth of The Wash. In addition, there is an extensive network of drainage systems within the vicinity of the Facility. WFD classification data from the Environment Agency's Catchment Data Explorer (2016) indicate that water quality in the surface drainage network is below the required standards.

Receptor	Baseline
	Groundwater The Environment Agency classified the Tidal Flat Deposits and Ancholme Clay Formation that underlies the Facility as unproductive strata. Unproductive strata are defined as rock layers or drift deposits with low permeability that have negligible significance for water supply or river base flow. The Environment Agency groundwater vulnerability maps indicate that site is located within an area of low groundwater vulnerability. This indicates that surface soils may provide some protection to groundwater from pollution and the area likely to be characterised by low leaching soils. As the groundwater is classed as unproductive strata, it would consider a pathway rather than a receptor (CDOIF, 2015).
Soils	Agricultural land use is detailed in within **Chapter 11 Contaminated Land, Land Use and Hydrogeology**. The classification of soils within the Principal Application Site is Agricultural Land Classification (ALC) Grade 1 (Excellent), and are described as loamy and clayey soils, developed from coastal flat deposits in an area with naturally high groundwater.
Heritage	All heritage assets within the heritage study areas are detailed and assessed in **Chapter 8 Cultural Heritage** and its associated appendices. There are no designated heritage assets are within the Principal Application Site. A total of six Listed Buildings are within 1 km, whilst four Scheduled Monuments and a further 22 Grade II* and I listed structures are found within 3 km. Non-designated assets within 1 km are predominantly medieval to modern in date, in the form of buried deposits associated with farmsteads. The most significant non-designated asset in terms of the Facility is the ‘Roman Bank’.

Receptor	Baseline
	This extant, currently poorly dated (through documentary evidence), earthwork passes through the centre of the Principal Application Site, consisting of a c.2 m high earthen flood bank.

Embedded Mitigation

23.6.2 The relevant embedded mitigation measures considered in **Chapter 5 Project Description, Chapter 11 Contaminated Land, Land Use and Hydrogeology**, **Appendix 13.2, Chapter 14 Air Quality** and **Chapter 18 Navigational Issues** are considered in relation to potential accidents and risks.

23.7 Potential Impacts

23.7.1 **Table 23-9** describes the impacts associated with potential major accidents and disasters that could arise on and off-site during the construction and operation phases of the Facility, the vulnerability of the site to such accident and disasters, and the potential for the Facility to cause major accidents and disasters. The assessment draws upon the potential major accidents and disasters and receptors discussed in **Table 23-8.**

Table 23-9 Potential Impacts during Construction and Operation

ID	Hazard/ Activity	Areal extent	Cause	Pathway	Receptor	Consequence	Severity of harm	Duration of effect	Magnitude of change	Baseline conditions/Embedded mitigation	Likelihood	Significance	Effect
1	Geophysical Landslide/ Instability	The Facility	Temporary works failure during excavation of the mud flats and land for the berthing pocket for the wharf. Slope failure associated with stockpiled materials. Natural phenomena.	Direct	Construction workers	Multiple injuries Loss of life in low numbers	Major	Medium	Medium	The Facility is not located within a coal mining affected area, and the Site setting generally has a low-moderate risk associated with ground stability issues. All construction works will be designed and undertaken in line with current health and safety and technical legislation and guidance. The works will also be progressed in compliance with the **Outline Code of Construction Practice (CoCP)** (document reference 7.1).	Very unlikely	Minor	**Not Significant**
2	Tidal Flooding	The Facility Could also extend beyond the Facility	Storm surge and inland flooding (precipitation).	Direct	Construction workers Operational workers Offsite residents or commercial workers	Multiple injuries Loss of life in low numbers	Major	Medium	Medium	The Principal Application Site is located in Flood Zone 3; however, the Environment Agency has confirmed this is associated with tidal flood risk rather than fluvial flood risk. The Principal Application Site would be at high risk of tidal flooding if it were not defended. However, primary defences with an effective crest level of 6.1 m AOD currently provide a 1 in 150-year standard of protection. Future works, as part of the Boston Combined Strategy, planned for completion in Winter 2020 will increase crest levels to a minimum of 6.5 mAOD, providing a 1 in 300-year standard of protection from tidal flooding, in line with 50 years of climate change adaptation	Very unlikely	Minor	**Not Significant**
				Direct	The Wash (SPA, Ramsar, SAC and SSSI)	Contaminated flood water/sediment loading resulting in detrimental impacts on designated sites	Severe	Medium	Low		Extremely unlikely	Negligible	**Not Significant**
				Direct	Havenside Local Nature Reserve (LNR)	Contaminated flood water/sediment loading resulting in detrimental	Catastrophic	Short	Not significant		**Not significant**		

ID	Hazard/ Activity	Areal extent	Cause	Pathway	Receptor	Consequence	Severity of harm	Duration of effect	Magnitude of change	Baseline conditions/Embedded mitigation	Likelihood	Significance	Effect
						impacts on designated sites				values, to the Principal Application Site. The wharf will be constructed with a flood defence line of +7.2 mAOD, thus affording further protection.			
				Surface water Overland flow	Off-site designated heritage assets (Scheduled Monument, Grade I Listed Building)	Flood damage	Not significant	Short	Not significant		**Not significant**		
				Surface water Overland flow	BMV soils	Inundation	Severe	Short	Not significant		**Not significant**		
3	Climatological Extreme temperatures	The Facility Could also extend beyond the Facility	Extreme prevailing conditions leading to direct impact to human health. Extreme temperatures leading to fire risk due to heating of waste during transit (on the ships), during storage, on the conveyors or within the tipping hall/ shredding stations. Extreme prevailing conditions leading to damage / failure of equipment and infrastructure (buildings, structures, stacks, lighting, safety and monitoring systems) and ships resulting in accidents.	Direct	Construction workers Operational workers Off-site residents / commercial workers	Multiple injuries Loss of life in low numbers	Major	Medium	Medium	An emergency protocol will be developed in advance of the construction works setting out the procedures to be adopted in the event of severe adverse weather during the construction phase. It will be included in the CoCP. The construction works will be progressed in compliance with the Outline CoCP which accompanies the ES. A Fire Prevention Plan for the Facility will be prepared in line with Environment Agency Guidance – Fire Prevention Plan Guidance Version 2, March 2015. This plan will be designed to meet the following three objectives: • Minimise the likelihood of a fire occurring; • Aim for a fire to be extinguished within four hours; and	Very unlikely	Minor	**Not Significant**
				Drainage Surface water Overland flow	The Wash (SPA, Ramsar, SAC and SSSI)	Significant spillage of fuel or firefighting chemicals, potentially impacting surface water and resulting in detrimental impacts on designated sites	Severe	Medium	Low		Extremely unlikely	Negligible	**Not significant**
				Surface water Overland flow	BMV soils	Damage to BMV soils via fuel spillage / firefighting chemicals, hazardous substances	Severe	Short	Not significant		**Not significant**		

ID	Hazard/ Activity	Areal extent	Cause	Pathway	Receptor	Consequence	Severity of harm	Duration of effect	Magnitude of change	Baseline conditions/Embedded mitigation	Likelihood	Significance	Effect
										• Minimise the spread of fire within the site and to neighbouring sites. The plan covers: RDF storage, plant and equipment, site infrastructure, electrical equipment, ignition sources, heat and spark prevention, flammable items and smoke, heat and flame detectors.			
4	Major accidents Widespread electricity failure and infrastructure failures	The Facility Could also extend beyond the Facility	Widespread electricity failure and infrastructure failures through power cuts.	Direct	Construction workers Operational workers Off-site residents / commercial workers	Multiple life changing injuries	Severe	Short	Not significant	Instances of electricity failure can be caused by adverse weather, malicious activities, failure of the generating and transmission infrastructure. Failures are often due to weather conditions and are generally localised. The likely increase of storms due to climate change and society's increasing demand on resources could lead to future power failures. The Facility has black start generators on-site which would cover an electrical failure.	**Not significant**		
				Drainage Surface water Overland flow	The Wash (SPA, Ramsar, SAC and SSSI)	Firefighting chemicals potentially impacting surface water and resulting in detrimental impacts on designated sites	Severe	Medium	Low		Extremely unlikely	Negligible	**Not significant**
				Surface water Overland flow	BMV soils	Damage to BMV soils via firefighting chemicals	Severe	Medium	Low		Extremely unlikely	Negligible	**Not significant**
5	Major accidents Infrastructure failure	The Facility Could also extend beyond the Facility	Collapse of buildings and/ or the wharf due to structural failure, deficient management and	Direct	Construction workers Operational workers	Multiple injuries Loss of life in low numbers	Major	Medium	Medium	All construction works will be designed in line with current health and safety and technical legislation and guidance.	Extremely unlikely	Negligible	**Not significant**

ID	Hazard/ Activity	Areal extent	Cause	Pathway	Receptor	Consequence	Severity of harm	Duration of effect	Magnitude of change	Baseline conditions/Embedded mitigation	Likelihood	Significance	Effect
			maintenance systems.		Off-site residents / commercial workers					The construction works will be progressed in compliance with the Outline CoCP which accompanies the ES. The Facility would be required to operate under an Environmental Permit issued by the Environment Agency. This permit will require a written management system for procedures to minimise the risk of pollution from activities covered by the permit. This will include an Accident Prevention and Management Plan to identify potential accidents and measures taken to avoid the accident happening and measures to minimise the impacts if an accident does occur.			
				Drainage Surface water Overland flow	The Wash (SPA, Ramsar, SAC and SSSI)	Firefighting chemicals potentially impacting surface water and resulting in detrimental impacts on designated sites	Severe	Medium	Low		Extremely unlikely	Negligible	**Not significant**
				Surface water Overland flow	BMV soils	Damage to BMV soils via firefighting chemicals	Severe	Medium	Low		Extremely unlikely	Negligible	**Not significant**
6	Major accidents Transport accidents	The Facility Could also extend beyond the Facility	Vessel to vessel collision. Vessel grounding within The Haven.	Direct	Construction workers Operational workers Other ship crews	Potential for substantial number of people requiring medical attention.	Not significant	Short term	Not significant	A Navigation Management Plan (NMP) will be produced in conjunction with the Port of Boston to manage navigational safety. A Notice to Mariners (NtM) will be published by the Port to inform the users of the Haven of the nature and duration of the activity, prior to any works commencing.	Very Unlikely	Minor	**Not significant**
				Direct	The Wash (SPA, Ramsar, SAC and SSSI)	Potential for accidental release of fuels or waste bales into the Wash.	Not significant	Medium	Low		Very Unlikely	Negligible	**Not significant**

23.8 Key Risks and Mitigation

23.8.1 Key risks and mitigation measures are explained in further detail below.

Flood Risk

23.8.2 As detailed in **Appendix 13.2**, the Facility incorporates both primary and secondary flood defence lines, with the primary flood defence line forming the proposed wharf and replacing the existing Environmental Agency flood defences. With this flood defence, a 1 in 300-year standard of protection will be provided following completion. Therefore, due to the nature and condition of the defences the risk of a breach flood event occurring which would affect the Facility is considered to be low.

23.8.3 In addition, flood resistance through resilient design will be incorporated to reduce damage to structures and electrical equipment.

23.8.4 In order to mitigate residual flood risk to the Facility due to storm surge, should there be a storm surge forecast or flood warning issued, users of the site should take action to ensure safe egress from the Principal Application Site. Additionally, a flood risk emergency plan will be implemented for the Principal Application Site which includes the identification of areas for safe refuge.

23.8.5 The Flood Risk Assessment concludes that due to the presence of the flood defence at the Facility the risk of tidal flooding is considered to be **low** and limited to a residual risk should there be a failure in the defences.

Navigational Issues

23.8.6 In order to provide mitigation of relevance to navigational safety on the Haven methodologies include:

- Carrying out capital and maintenance dredging of the wharf from land, using land-based equipment; and,
- Carrying out construction of the wharf from land.

23.8.7 In addition, in order to manage potential impacts which could arise from the construction and operation of the Facility, a Navigation Management Plan (NMP) will be produced in conjunction with the Port of Boston, to manage navigational safety.

23.8.8 Prior to the construction works commencing, there will also be a Notice to

Mariners (NtM) published by the Port to inform users of The Haven of the nature and duration of the activity.

23.8.9 During operation, open and frequent communication between the Facility and the Port, as set out in the NMP, will be maintained throughout the lifetime of the project to ensure the safety of navigation on The Haven and the continued safe operation of the Port.

General Risk Mitigation

23.8.10 In addition to the Development Consent Order (DCO), the Facility will be required to operate under an Environmental Permit issued by the Environment Agency. This permit will require a written management system for procedures to minimise the risk of pollution from activities covered by the permit. This will include an Accident Prevention and Management Plan to identify potential accidents and measures taken to avoid the accident happening and measures to minimise the impacts if an accident does occur. Contingency plans will also be included which will plan for minimising the impact on the environment in the event of a breakdown, enforced shutdown or other changes to normal operations (such as flooding or extreme weather). These plans will also consider changes due to climate change. A Fire Prevention Plan will also be included as part of this application.

23.8.11 Mitigation measures as discussed in the final Code of Construction Practice (CoCP) would provide mechanism by which environmental impacts associated with the construction of the Facility will be formally controlled and mitigated. The **Outline Code of Construction Practice** (**OCoCP**) (document reference 7.1) summarises general principles and control measures which provides a framework for the final CoCP, developed post-consent.

23.8.12 Appropriate legislative procedures such as the Construction (Design and Management) Regulations 2015 will also be in place.

Potential Impacts during Decommissioning

23.8.13 No decision has been made regarding the final decommissioning policy for the Facility as it is recognised that industry best practice, rules and legislation change over time. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.

23.9 Cumulative Impacts

23.9.1 The assessment of cumulative impact will be undertaken as a two stage process. Firstly, all the impacts from previous section will be assessed for potential to act cumulatively with other projects. This summary assessment is set out in **Table 23-10**.

Table 23-10 Potential Cumulative Impacts

Impact	Potential for cumulative impact	Rationale
Construction		
Impact on human health	Yes	There is the potential for multiple injuries / loss of life should there be a major accident or disaster during the construction / operational phase of the Facility that could result in cumulative effects.
Impact on biodiversity	Yes	There is the potential for impacts on water quality and damage to / loss of habitats / species should there be a major accident or disaster during the construction / operational phase of the Facility that could result in cumulative effects.
Impact on surface water	Yes	There is the potential for impacts on water quality should there be a major accident or disaster during the construction / operational phase of the Facility that could result in cumulative effects.
Impact on BMV soils	Yes	There is the potential for cumulative impacts on BMV soils should there be major accident or disaster during the construction / operation phase of the Facility.
Impact on off-site designated heritage assets	Yes	There is the potential for cumulative impacts on listed buildings should there be major accident or disaster during the construction / operational phase of the Facility.
Decommissioning		
The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the relevant authorities. A decommissioning plan will be provided. As such, cumulative impacts during the decommissioning stage are assumed to be no worse than those identified during the construction stage.		

23.9.2 **Table 23-11** presents projects that are likely to have cumulative impacts when considered alongside the Facility. Each of these projects have been scoped in or out of the accident and risk management aspect of the cumulative impact assessment. Projects of more than 1 km from the site have been scoped out as these projects would not present a relevant pathway to cause cumulative impacts in terms of risks and major accidents.

Table 23-11 Summary of Projects considered for CIA in Relation to Accidents and Risk Management

Project	Status	Development Period	Distance from the Application Site	Project Definition	Project Data Status	Included in CIA	Rationale
Boston Barrier Flood Defence	Transport and Works Act Order consented	2017 – ongoing (completed August 2021)	Boston Barrier at closest point to the Application Site is 500 m.	Environmental Statement	Complete / high	No	Based on the latest Boston Barrier Flood Defence timescales It is determined that the scheme will complete by August 2021 ahead of the planned earliest start date (October 2021) of construction of the Facility. However, even if it is considered as a worst case, there are no potential major accidents associated with the Barrier that would affect the Facility, given the Facility is down-river.
Battery Energy Storage Plant (Marsh Lane) B/17/0467	Application approved	2017 - ongoing	Beeston Farm less than 10 m from the Application Site	Detailed application	Incomplete / low	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.

Project	Status	Development Period	Distance from the Application Site	Project Definition	Project Data Status	Included in CIA	Rationale
Land to the west of Stephenson Close Residential Development of up to 85 dwellings B/17/0515	Application not yet determined	2017 - ongoing	From the most eastern part of the Scheme to the Application Site is 550 m.	Outline only	Incomplete/ low	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Plots C and D, The Quadrant, Land adjacent to A16, Wyberton, Boston For approval of reserved matters (appearance, layout and scale) for the construction of hotel, public restaurant and drive-thru B/18/0413	Application approved	2018 – ongoing	1 km south west of the Application Site	Application for approval of reserved matters	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.

Project	Status	Development Period	Distance from the Application Site	Project Definition	Project Data Status	Included in CIA	Rationale
The Quadrant, PE21 7HT Application for approval of reserved matters from application B/14/0165 (roads 6, 7 and 8) B/19/0027	Application approved	2018 – ongoing	1 km south west of the Application Site	Application for approval of reserved matters	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Howards Tenens Ltd, Riverside Industrial Estate, Marsh Lane, Boston, Lincolnshire PE21 7SZ Erection of a storage and distribution building. B/18/0063	Application approved	2018 – ongoing	500 m north west of the Application Site	Detailed application	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Land off Lealand Way, Marsh Lane Industrial Estate, Boston, PE21 7SW	Application approved	2019 – ongoing	422 m north of the Application Site	Detailed Application	Incomplete / low	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified

Project	Status	Development Period	Distance from the Application Site	Project Definition	Project Data Status	Included in CIA	Rationale
Installation of a 6.0 MW Gas Fired Power Generation Site, associated infrastructure and new means of access B/19/0474							in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Boston College De Montfort Campus, Mill Road, Boston, Lincolnshire, PE21 0HF Demolition of university campus and erection of 108 dwellings and associated infrastructure B/15/0100	Application approved	2015 - ongoing	700 m north of the Application Site	Detailed Application	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Land to the east of Whitehouse Lane, Fishtoft, Boston, PE21 0BH Outline application with for proposed residential	Application approved	2018 - ongoing	900 m east of the Application Site	Outline only	Incomplete/ low	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed

Project	Status	Development Period	Distance from the Application Site	Project Definition	Project Data Status	Included in CIA	Rationale
development of up to 83 no. dwellings B/18/0012							that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Land off Wyberton Low Road, Wyberton, Boston, PE21 7SF Hybrid outline application for residential development (up to 200 dwellings)	Application approved	2017 - ongoing	800 m west of the Application Site	Detailed Application	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Heron Park, Wyberton Low Road, Wyberton, Boston, PE21 7RZ Construction of 32 dwellings (Phase 2), plus associated roads, parking areas and attenuation basin following the grant of outline planning	Application approved	2018 - ongoing	800 m west of the Application Site	Application for approval of reserved matters	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the

Project	Status	Development Period	Distance from the Application Site	Project Definition	Project Data Status	Included in CIA	Rationale
permission for up to 200 dwellings							potential for cumulative effects to occur.
Land to the west of Stephenson Close, Boston, PE21 7SY Outline application for the erection of up to 85 dwellings, public open space and associated infrastructure B/17/0515	Not yet determined	2017 - ongoing	1 km east of the Application Site	Outline only	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.
Land North of Tytton Lane East, Wyberton, Boston, PE21 7TD Outline planning permission for 132 dwellings B/20/0235	Not yet determined	2020 - ongoing	1 km east of the Application Site	Outline only	Complete / high	Yes	Due to the proximity of the development to the Facility there is the potential for cumulative effects on the receptors identified in this chapter. However, due to the nature of the development and the regulatory regime under which it will be constructed, it is assumed that appropriate mitigation measures are incorporated into the design thus limiting the potential for cumulative effects to occur.

23.9.3 In summary, as all potential cumulative schemes will be constructed under a regulatory regime and appropriate mitigation measures implemented, it is unlikely that there will be any significant risks associated with them.

23.10 Inter-Relationships with Other Topics

23.10.1 This chapter has inter-relationships with **Chapter 11 Contaminated Land, Land Use and Hydrogeology, Chapter 13 Surface Water, Flood Risk and Drainage Strategy, Appendix 13.2, Chapter 14 Air Quality** and **Chapter 18 Navigational Issues** all covered within **Table 23-7** and **Table 23-9 .**

23.11 Interactions

23.11.1 The impacts identified and assessed in this chapter have the potential to interact with each other, which could give rise to synergistic impacts because of that interaction. The worst case impacts assessed within the chapter take these interactions into account and for the impact assessments are considered conservative and robust. For clarity, the areas of interaction between impacts are presented in **Table 23-12**, along with an indication as to whether the interaction may give rise to synergistic impacts.

Table 23-12 Interaction Between Impacts

Potential interaction between impacts						
Construction and Operation						
	1. Geophysical - Landslide/ Instability	2. Tidal Flooding	3. Extreme temperatures	4. Widespread electricity failure	5. Infrastructure failure	6. Transport accidents (vessel to vessel and vessel grounding
1. Geophysical - Landslide/ Instability	-	Yes	No	No	Yes	No
2. Tidal Flooding	Yes	-	No	Yes	Yes	Yes
3. Extreme temperatures	No	No	-	No	Yes	No
4. Widespread electricity failure	No	Yes	No	-	No	No
5. Infrastructure failure	Yes	Yes	Yes	No	-	No

Potential interaction between impacts						
6. Transport accidents (vessel to vessel and vessel grounding	No	Yes	No	No	No	-
Decommissioning						
It is anticipated that the decommissioning impacts will be similar in nature to those of construction.						

23.12 Summary

23.12.1 A summary of the findings for accidents and risk assessment is provided in **Table 23-13**.

Table 23-13 Impact Summary

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
Construction									
Geophysical Landslide/ Instability	Construction workers	Major	Medium	Medium	Very unlikely	Minor	Not Significant	N/A	Not significant
Tidal Flooding	Construction workers Offsite residents or commercial workers	Major	Medium	Medium	Very unlikely	Minor	Not Significant	N/A	Not significant
	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not Significant	N/A	Not significant
	Havenside Local Nature Reserve	Catastrophic	Short	Not significant	Not significant			N/A	Not significant

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
	(LNR)								
	Off-site designated heritage assets (Scheduled Monument, Grade I Listed Building)	Not significant	Short	Not significant	Not significant			N/A	Not significant
	BMV soils	Severe	Short	Not significant	Not significant			N/A	Not significant
Climatological Extreme temperatures	Construction workers Off-site residents / commercial workers	Major	Medium	Medium	Very unlikely	Minor	Not significant	N/A	
	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
	BMV soils	Severe	Short	Not significant	Not significant			N/A	Not significant

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
Major accidents Widespread electricity failure and infrastructure failures	Construction workers Off-site residents / commercial workers	Severe	Short	Not significant	Not significant			N/A	Not significant
	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
	BMV soils	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
Major accidents Infrastructure failure	Construction workers Off-site residents / commercial workers	Major	Medium	Medium	Extremely unlikely	Negligible	Not significant	N/A	Not significant
	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
	BMV soils	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
Major accidents	Construction workers Other ship crews	Not significant	Short term	Not significant	Very Unlikely	Minor	Not significant	N/A	Not significant
Transport accidents (vessel to vessel and ship grounding)	The Wash (SPA, Ramsar, SAC and SSSI)	Not significant	Medium	Low	Very Unlikely	Negligible	Not significant	N/A	Not significant

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
Operation									
Tidal Flooding	Operational workers Offsite residents or commercial workers	Major	Medium	Medium	Very unlikely	Minor	Not Significant	N/A	Not significant
	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not Significant	N/A	Not significant
	Havenside Local Nature Reserve (LNR)	Catastrophic	Short	Not significant	Not significant	N/A	Not significant	N/A	Not significant
	Off-site designated heritage assets (Scheduled	Not significant	Short	Not significant	Not significant	N/A	Not significant	N/A	Not significant

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
	Monument, Grade I Listed Building)								
	BMV soils	Severe	Short	Not significant	Not significant	N/A	Not significant	N/A	Not significant
Climatological Extreme temperatures	Operational workers Off-site residents / commercial workers	Major	Medium	Medium	Very unlikely	Minor	Not significant	N/A	Not significant
	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
	BMV soils	Severe	Short	Not significant	Not significant	N/A	Not significant	N/A	Not significant
Major accidents Widespread electricity failure and	Operational workers Off-site residents / commercial workers	Severe	Short	Not significant	Not significant	N/A	Not significant	N/A	Not significant

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
infrastructure failures	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
	BMV soils	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
Major accidents Infrastructure failure	Operational workers Off-site residents / commercial workers	Major	Medium	Medium	Extremely unlikely	Negligible	Not significant	N/A	Not significant
	The Wash (SPA, Ramsar, SAC and SSSI)	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant
	BMV soils	Severe	Medium	Low	Extremely unlikely	Negligible	Not significant	N/A	Not significant

Potential Impact	Receptor	Severity of harm	Duration of effect	Magnitude	Likelihood	Significance	Effect	Additional Mitigation	Residual Effect
Major accidents	Operational workers Other ship crews	Not significant	Short term	Not significant	Very Unlikely	Minor	Not significant	N/A	Not significant
Transport accidents (vessel to vessel and ship grounding)	The Wash (SPA, Ramsar, SAC and SSSI)	Not significant	Medium	Low	Very Unlikely	Negligible	Not significant	N/A	Not significant
Decommissioning									
No additional impacts on accidents and risk management are anticipated during the decommissioning phase than those identified during construction.									

23.13 References

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