

The Lighthouse Green Fuels Order

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Applicant: LGF Projects Limited

Environmental Statement Volume III

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Abbreviations

Acronym	In Full / Term
AIL	Abnormal Indivisible Load
BPM	Best Practicable Means
CCS	Considerate Constructors Scheme
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CNVMP	Construction Noise and Vibration Management Plan
COMAH	Control of Major Accident Hazards
COSHH	Control of Substances Hazardous to Health
CSWMP	Construction Surface Water Management Plan
CTMP	Construction Traffic Management Plan
CWTP	Construction Worker Travel Plan
DCO	Development Consent Order
DEMP	Decommissioning Environmental Management Plan
DMP	Dust Management Plan
EA	Environment Agency
EIA	Environmental Impact Assessment
EPC Contractor	Engineering, Procurement and Construction Contractor
ES	Environmental Statement
EU	European Union
fCEMP	Framework Construction Environmental Management Plan
fCTMP	Framework Construction Traffic Management Plan
fCWTP	Framework Construction Worker Travel Plan
FRAP	Flood Risk Activity Permit
fSWMP	Framework Site Waste Management Plan
GHG	Greenhouse Gas
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
INNS	Invasive Non-Native Species
LEV	Local Exhaust Ventilation
LGF	Lighthouse Green Fuels
LWS	Local Wildlife Site
MAH	Major Accident Hazard
MMP	Materials Management Plan
mph	Miles per hour

Acronym	In Full / Term
MSDS	Material Safety Data Sheet
NO ₂	Nitrogen dioxide
NO _x	Oxides of Nitrogen
NPS	National Policy Statements
NRMM	Non-Road Mobile Machinery
NSR	Noise Sensitive Receptor
PINS	Planning Inspectorate
PM	Particulate matter
PM ₁₀	Particulate matter with a diameter of 10 micrometres (µm) or less
PPE	Personal protective equipment
µm	Micrometre
RCBC	Redcar and Cleveland Borough Council
SAC	Special Area of Conservation
SAF	Sustainable Aviation Fuel
SoS	Secretary of State
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
STBC	Stockton on Tees Borough Council
SWMP	Site Waste Management Plan
UK	United Kingdom

1 Introduction

1.1 Overview and purpose of the document

- 1.1.1 This Framework Construction Environmental Management Plan (fCEMP) has been prepared by Ove Arup and Partners Ltd (Arup) on behalf of LGF Projects Ltd (the Applicant), to support an application (the Application) seeking development consent for the construction, operation, maintenance and decommissioning of the Lighthouse Green Fuels (LGF) project (the Proposed Development) on land within the administrative boundaries of Stockton-on-Tees Borough Council (STBC) and Redcar and Cleveland Borough Council (RCBC).
- 1.1.2 An Environmental Impact Assessment (EIA) has been undertaken and the Environmental Statement (ES) (refer to **Chapters 1-23 (ES Volume I, Application Document Ref. 6.1)**) reports on the assessment of likely significant effects. A range of embedded mitigation and construction management measures that will be implemented during the construction of the Proposed Development are accounted for in the assessments. The EIA also identifies some additional construction phase mitigation measures, hereon referred to as further or additional mitigation, to reduce the significance of effects. This fCEMP summarises all these construction mitigation measures. It also sets out the planned monitoring activities designed to demonstrate that such mitigation measures are carried out, and that they are effective.
- 1.1.3 This document does not address decommissioning activities, which are subject to separate environmental management plans and/or controls. Where relevant, these will be secured by a Requirement in the **draft Development Consent Order (DCO) (Application Document Ref. 3.1)**, for a Decommissioning Environmental Management Plan (DEMP) and the Environmental Permit.
- 1.1.4 Detailed Construction Environmental Management Plan(s) (CEMP(s)) will be prepared and implemented by the appointed Engineering Procurement and Construction (EPC) Contractor(s) in accordance with this fCEMP, as secured by a Requirement in the **draft DCO (Application Document Ref. 3.1)**.
- 1.1.5 The key elements of this fCEMP include:
- an overview of the Proposed Development and associated construction programme;
 - proposed design and other mitigation measures to prevent or reduce potential adverse environmental impacts;

- monitoring and reporting of effectiveness of mitigation measures; and
- links to other complementary plans and procedures.

1.1.6 Any additional licences, permits, or approvals that are required will be listed in the detailed CEMPs.

1.2 The Applicant

1.2.1 The Applicant is wholly owned by Alfanar Energy Limited (Alfanar). Alfanar is part of a global project development, manufacturing and engineering group headquartered in Saudi Arabia. Alfanar has developed significant in-house feedstock-to-Sustainable Aviation Fuel (SAF) expertise. This experience will be utilised to construct and operate the Proposed Development.

1.3 The Proposed Development

1.3.1 The Proposed Development is anticipated to be the UK's first commercial-scale second generation SAF production facility. It will comprise the following key elements:

- feedstock reception and storage;
- feedstock pre-treatment facility;
- SAF processing facility (producing SAF and renewable naphtha);
- Combined Heat and Power (CHP) plant; and
- product handling, storage and export pipelines.

1.3.2 To support the SAF production facilities, the following are also required and are included in the DCO:

- marine transport infrastructure (a new quay) for both construction and operational (feedstock import) purposes;
- bridge and culvert crossings of existing infrastructure;
- installation of pipelines for utilities (such as natural gas, industrial gases and industrial waste water) and export of carbon dioxide and electrical connection works;
- drainage infrastructure and laydown areas; and
- a range of other associated development.

- 1.3.3 The Main Site is located in the industrial area of Seal Sands approximately 5km east of Billingham town centre and 4km north-east of Middlesbrough town centre, on the north bank of the River Tees in the borough of Stockton-on-Tees). The majority of the Main Site lies south of Seal Sands Road and largely comprises previously developed land formerly used as a chemical plant from the early 1970s.
- 1.3.4 The Main Site comprises the main SAF facility development area of the Site, lying to the south and north sides of Seal Sands Road and bounded by the proposed quay in the River Tees, with the River Tees to the east.
- 1.3.5 The eastern boundary of the Main Site is formed by the River Tees, where existing jetties will be demolished and a new quay developed.
- 1.3.6 The Wider Site comprises the connection corridors, including land required for road access, pipelines (including under the River Tees), dredging near to the Main Site, and utility connections and construction laydown in both North Tees and (in the borough of Redcar and Cleveland) South Tees.
- 1.3.7 The location of the Proposed Development is shown in **Figure 1.1: Site Location Plan (ES Volume II, Application Document Ref. 6.2)**. The Proposed Development Site (the Site) and its surroundings are described in **Chapter 3: The Site and Surrounding Area (ES Volume I, Application Document Ref. 6.1)** and a description of the Proposed Development is provided in **Chapter 4: Proposed Development (ES Volume I, Application Document Ref. 6.1)**.

2 Construction environmental management

2.1 Introduction

2.1.1 The following section describes the Proposed Development's construction and general site arrangements.

2.2 Roles and responsibilities

2.2.1 This section sets out the key EPC Contractor(s) roles and responsibilities during the construction phase in managing environmental impacts. The detailed CEMPs prepared by the appointed EPC Contractor(s) prior to construction will confirm exact roles and responsibilities and include contact details for key members of staff. Clearly establishing roles and responsibilities is vital to ensure the successful construction of the Proposed Development, including the implementation of the detailed CEMPs. Roles will likely include, but are not limited to:

- Construction Stage Project Manager;
- Site Manager;
- Environmental Manager;
- Ecological Clerk of Works (ECoW);
- Flood Warden;
- Health and Safety Manager;
- Community Liaison Officer;
- Construction Traffic Liaison; and
- all other Staff will be expected to understand and implement procedures relevant to their role as laid out in the detailed CEMPs, conduct work with a view to reducing environmental impact and to raise any environmental concerns and report all environmental incidents to the Site Manager.

2.3 Construction programme

- 2.3.1 The Proposed Development construction programme is anticipated to commence shortly after the DCO decision (currently projected to be by the end of 2027) and after the Final Investment Decision (FID). The construction phase is therefore likely to be approximately three to four years in duration lasting from 2028 to 2031.
- 2.3.2 The key stages of the construction programme are currently expected to be:
- 2028 - 2029 – Preliminary Works, site establishment, site preparation, commencement and completion of quay construction, and commencement of civil engineering works (referred to as ‘civils works’);
 - 2029 - 2030 – Continued civil engineering works, construction of the SAF production facility, CHP plant and infrastructure including utilities, pipelines and other connections in the Main Site, together with construction of other pipeline and utility connections in the Wider Site. Module deliveries, mechanical installation and electrical and instrumentation installation works would also take place during this period; and
 - 2030-2031 – Completion of civils works, pipeline, mechanical installation and electrical and instrumentation installation works, followed by commissioning of the Proposed Development and commencement of operations in late 2031.

An outline construction programme is shown in Table 2.1.

Table 2.1 Outline construction programme

	2028				2029				2030				2031			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Quay construction																
Preliminary Works and site preparation																
Civils (construction of the SAF production facility, CHP plant and related infrastructure)																
Module deliveries																
Mechanical installation																
Electrical and instrumentation installation																
Pipelines and utilities																
Commissioning																
Operation																

- 2.3.3 To optimise the construction schedule and minimise disruption, modular construction will be undertaken where practicable, with modules constructed off-site. This will allow modular plant and equipment to be delivered to the Site by ship and offloaded via the new quay to the east of the Main Site. This will reduce Abnormal Indivisible Loads (AILs) and Heavy Goods Vehicle (HGV) traffic on the road network during construction and will optimise the duration of the site construction programme. Areas of the Main Site as well as third-party land within the Wider Site will be used for temporary construction compounds (see **Figure 5.1: Construction Layout, ES Volume II, Application Document Ref. 6.2**).

2.4 Working hours

- 2.4.1 Core construction working hours will be between 07:00 and 19:00 Monday to Friday (except bank holidays), Saturday 07:00 to 16:00 and Sunday 08:00 to 17:00. However, it is likely that some construction activities may need to be undertaken outside of these core working hours. This is principally because certain construction activities cannot be stopped, such as concrete pouring, but also potentially to manage the construction programme and ensure the completion of the works in line with the agreed timescales for commissioning.
- 2.4.2 Where works within the Proposed Development are to be conducted outside the core hours, they would comply with any restrictions in the construction hours requirement in the **draft DCO (Application Document Ref. 3.1)** and as otherwise agreed with the local planning authority, in particular regarding control of noise and traffic. Twenty-four hour working for certain activities has therefore been assessed in **Chapter 9: Noise and Vibration (ES Volume I, Application Document Ref. 6.1)** which sets out specific mitigation and control measures required to prevent disturbance from any activities outside of core working hours. A Requirement in the **draft DCO (Application Document Ref. 3.1)** secures the working hours and the approach to exceptions to the core working hours.

2.5 Control of noise and vibration

- 2.5.1 Unless otherwise authorised by the DCO, activities that could generate a noise nuisance will not be undertaken outside of the core construction working hours (i.e. between 19:00 and 07:00) unless by prior agreement with the local planning authority (with certain continuous activities excepted). Such activities include but are not limited to sheet piling, percussive piling, use of impact wrenches, concrete scabbling, use of reversing sirens, and concrete jack hammering. Noise monitoring will be installed at the boundary of the Site closest to receptors, with a daytime and night-time noise limit to be used during construction, as agreed with STBC and RCBC.

2.6 Control of light

- 2.6.1 Lighting will be required during construction for safety reasons but will be temporary in nature and, with the exception of security lighting, predominantly limited to the core working hours.
- 2.6.2 Temporary generators are likely to be required during construction and mobile generators will be used where a permanent supply is not practicable (refer to **Chapter 5: Construction Programme and Management, ES Volume I, Application Document Ref. 6.1**). Details of the number of generators, sizing and modes of operation will be defined by the EPC Contractor(s), as appropriate.
- 2.6.3 Construction lighting will be arranged so that glare is minimised outside of the construction site. The appointed EPC Contractor(s) will be responsible for establishing the required approach to lighting during construction and operation and a detailed Lighting Strategy will be prepared for approval pursuant to Schedule 2 (Requirements) in the **Draft DCO (Application Document Ref. 3.1)**. A Framework Lighting Strategy is included within the DCO Application (**Appendix 13C: Framework Lighting Strategy (ES Volume III, Application Document Ref. 6.3)**).
- 2.6.3.1 Lighting will be designed so as to minimise any potential nuisance (as far as practicable). The following principles for lighting will be adhered to:
- lights installed to be of the minimum brightness and/or power rating capable of performing the desired function, whilst also ensuring a safe and secure construction site;
 - precautionary measures will be considered to avoid shadows cast from the Site onto surrounding footpaths, walkways, roads and amenity areas. Lighting may be combined with smart-technology where appropriate, such as light activated with motion sensors to avoid unnecessary usage and act as a security method;

- where necessary, task-based lighting will be provided for specific high-risk tasks. Task-based lighting will be switched off following completion of the relevant task or at the end of the working shift (where the task is ongoing);
- lighting during construction will follow a sensitive design (motion-sensor, horizontal cut-off optics (where practicable) and zero floodlight tilt angles) to minimise light spill towards sensitive receptors;
- lighting will be visually checked after installation during night-time from the perspective of sensitive receptors and any necessary adjustments promptly made;
- artificial lighting (required outside daylight hours) will not change the apparent colour or visibility of any safety signs or other safety-related items (such as fire extinguishers); and
- lighting will be directed towards the middle of the construction site, rather than towards the Site boundary.

2.7 Traffic management

- 2.7.1 Construction access to the Main Site and associated utility connections in North Tees will be from Seal Sands Road which connects to the trunk road network via the A1185 and the A689/A19. It is anticipated that there will be a number of access points to the Main Site from Seal Sands Road. There will also be access from Huntsman Drive to the North Tees estate for the off-site electrical connection and also to the Linkline pipeline corridor (**Figure 5.1: Construction Layout, ES Volume II, Application Document Ref. 6.2**).
- 2.7.2 In South Tees, construction access for pipeline connections will be either from the Wilton International North Gate off the A1085 Steel House Gate Roundabout and then via the internal Sembcorp Road network to the Dabholm Gut, or alternatively, via the A1053, Tees Dock Road.
- 2.7.3 There will be an estimated peak of around 180 HGV one-way movements per day to the Main Site. There will be a small number of HGV movements per day for connections south of the River Tees.
- 2.7.4 AILs may be delivered to the Main Site via the highway network. However, the primary route for AIL and module delivery will be via ship using the newly constructed quay. It is expected approximately 300 consignments in 200 shipments will be required to facilitate the delivery of modular plant and construction equipment over an 18-month period within the construction phase.
- 2.7.5 During construction, the EPC Contractor(s) will ensure that the impacts from construction traffic on the local community (including local residents and businesses and users of the surrounding transport network) are minimised, by implementing the measures set out in the **Framework Construction Traffic Management Plan (Appendix 18D: fCTMP (ES Volume III, Appendix Ref. 6.3))** and **Framework Construction Worker Travel Plan (Appendix 18D: fCWTP (ES Volume III, Appendix Ref. 6.3))**.
- 2.7.6 Construction access will be confirmed in the detailed CEMP and Construction Traffic Management Plan (CTMP) as the design progresses and in consultation with the relevant highway authority.

2.8 Construction laydown areas and parking

2.8.1 Proposed construction laydown areas, storage, site offices, welfare facilities and car parking will be located at various places within the boundaries of the Main Site and Wider Site. There will be construction laydown areas on currently vacant land to the north of the Main Site. Locations for satellite compounds may also be required where utility connections are being constructed in the Wider Site outside of the Main Site.

2.8.2 Clearance, levelling and ground preparation works for these laydown areas may be required to provide a suitable surface material. Where appropriate, the surface material will be permeable to allow uncontaminated rainwater to percolate into the ground. Suitably bunded locations will be identified as temporary storage areas for any hazardous or polluting materials or chemicals to reduce the risk of pollution during construction.

2.9 Wheel cleaning facilities

2.9.1 In the interests of highway safety, impacts to air quality and prevention of the spread of ecological invasive non-native species (INNS), wheel cleaning facilities will be installed on-site from the start of the construction phase. All HGVs which have left the paved areas and tarmac roads inside the Site will use the wheel wash as appropriate when exiting the Main Site.

2.10 Recycling and waste

2.10.1 In order to control the waste generated during site preparation and construction, the EPC Contractor(s) will separate the main waste streams on-site, prior to transport to an approved, licenced third party waste facility for recycling or disposal.

2.10.2 A Framework Site Waste Management Plan (fSWMP) (**Appendix 5B, ES Volume III, Application Document Ref. 6.3**) has been developed as part of the DCO Application. A detailed SWMP will be prepared by the EPC Contractor(s), in substantial accordance with the fSWMP, which will specify the waste streams which would be monitored and targets set with regards to the waste produced, including any re-use and recycling of materials.

2.10.3 In accordance with the waste hierarchy, the Proposed Development will prioritise waste prevention, followed by preparation for reuse, recycling and recovery, with disposal (such as landfill) as the last resort.

2.10.4 All waste to be removed from the Site will be undertaken by a fully licensed waste carrier and taken to a suitably licensed waste management facility and managed in line with the requirements of The Waste (England and Wales) Regulations 2011 [Ref 1] and The Hazardous Waste (England and Wales) Regulations 2005 [Ref 2].

2.11 Security and storage

- 2.11.1 Site security during construction will be managed by the EPC Contractor(s). The Site security fencing (installed as part of preliminary works) will remain in place throughout the duration of the construction period.
- 2.11.2 There will be a need for the storage of some materials transported to the Site. These materials will be managed through measures included within the Materials Management Plan which will be developed as part of the detailed CEMP(s) (where relevant). When not in use at the end of each shift, small mobile plant will be returned to overnight plant storage areas, in the Main Site (which is at low risk of flooding) or Wider Site, where drip trays will be utilised under the various types of plant, if required to prevent spillages.
- 2.11.3 Storage areas for flammable/toxic /corrosive materials will be located in a separate secured area. Material Safety Data Sheets (MSDSs) will be available for all these materials and the Control of Substances Hazardous to Health (COSHH) assessments kept within the relevant risk assessment for the task, all subject to the Applicant's approval.
- 2.11.4 Any storage of materials will be kept secure to prevent theft or vandalism. A safe system for accessing the materials storage area would be implemented by the EPC Contractor(s).

2.12 Responding to environmental incidents and emergencies

- 2.12.1 An Emergency Response Plan (ERP), Pollution Prevention Plan (PPP) and Flood Warning and Evacuation Plan (FWEP) will be developed by the appointed EPC Contractor(s) as part of the detailed CEMP(s) (where relevant), prior to the commencement of construction (save for preliminary works).
- 2.12.2 A PPP will include details of how fuel and other chemicals will be stored, used on-site, and equipment and plant cleaned, as well as how leaks and spillages will be prevented or remediated if needed.
- 2.12.3 An ERP will outline the management of potential emergency situations involving containment of hazardous substances, in accordance with Part 4 (Regulations 11-16) of The Control of Major Accident Hazards Regulations 2015 (COMAH Regulations) [Ref 3].
- 2.12.4 The FWEP will be developed taking into account the measures outlined in the **Flood Risk Assessment (Application Document Ref. 5.7))**.

2.13 Good practice

- 2.13.1 The Considerate Constructors Scheme (CCS) will be considered to assist in reducing pollution and nuisance from the Proposed Development, by employing good industry practice measures which go beyond statutory compliance.

3 Mitigation and management

3.1 Overview

- 3.1.1 This section of the fCEMP sets out the mitigation and management measures to be included as a minimum in the detailed CEMP(s). It also identifies where monitoring is proposed, to assess the effectiveness of the mitigation measures. Nothing in this fCEMP would prevent the modification or omission of the control measures set out in Table 3.1 to Table 3.12, in the detailed CEMP(s), where the construction methodology means that the measures can be so modified or omitted. This will be confirmed (including confirming that the absence or change to such control measures would not lead to any materially new or materially different effects than those reported in the ES) at the time of submission of the detailed CEMP(s) to the relevant planning authority.

3.2 Committed mitigation and management measures

3.2.1 A summary of the mitigation and management measures to be included as a minimum in the detailed CEMP (save where reference is made to other management plans where the measures will be included in detailed versions of those plans), is provided below.

Table 3.1 Air Quality

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Increased NO_x and particulate matter (PM) from on-site and off-site construction vehicles and plant emissions. Increased dust deposition from Site activities, materials transportation, storage and handling, including use of haul roads.	Appropriate mitigation and control measures would include the following measures from the Institute of Air Quality Management (IAQM) best practice guidance [Ref 4]. General - display the name and contact details of person(s) accountable for air quality and dust issues on the Site. This may be the environmental manager, construction project manager or the site manager; - display the EPC Contractor(s) head or regional office contact information; and - develop and implement a Dust Management Plan (DMP) (as relevant and required to the proposed works), which may include measures to control other emissions, approved by the relevant local planning authority. Site management - record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken; - make the complaints log available to the local planning authority when asked; - record any exceptional incidents that cause dust and/or air emissions, either on-site or offsite, and the action taken to resolve the situation in the logbook; and	The overall responsibility will be with the Applicant. Specific responsibilities will be confirmed in the detailed CEMP. The following monitoring will be undertaken in line with the IAQM best practice guidance [Ref 4]: - undertake daily on-site and off-site inspections, where receptors (including roads) are nearby. To monitor dust levels and deposits, record inspection results and make the log available to the local planning authority when requested; - carry out regular Site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local planning authority or authorities when requested;

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	- hold regular liaison meetings with other third party, high-risk construction sites within 250m of the construction site(s) for the Proposed Development, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the up-to-date picture of the interactions of the off-site transport / deliveries which might be using the same strategic road network routes. Preparing and maintaining the Site - plan site layout so that machinery and dust causing activities are located away from receptors, as far as practicable; - erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on-site; - fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period; - avoid site run-off of water, silt or mud; - keep site fencing, barriers and scaffolding clean using wet cleaning methods; - remove materials that have a potential to produce dust from site as soon as practicable, unless being re-used on-site. If they are being re-used on-site cover as described below; and - cover, seed, or fence stockpiles to prevent wind-whipping. Operating vehicle / machinery and sustainable travel - ensure all vehicles / machinery switch off engines when stationary / not in use – no idling vehicles. There should be an anti-idling policy in place for all vehicles; - avoid the use of diesel- or petrol-powered generators and use mains electricity, hybrid or battery powered equipment, where practicable; - impose and signpost a maximum-speed-limit of 15 mph on surfaced roads and 10 mph on unsurfaced haul roads and work areas within the Site;	- increase the frequency of Site inspections by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and - agree dust deposition, dust flux, or real-time PM10 (particulate matter with a diameter of 10 micrometres (µm) or less) continuous monitoring locations with the local planning authority. Where practicable, commence baseline monitoring at least three months before work commences on-site or, if a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction [Ref 5].

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	- where reasonably practicable, locate static plant away from sensitive boundaries or receptors; - encourage sustainable travel (public transport and carsharing); - where practicable minimise Non-Road Mobile Machinery (NRMM) operating time outside of core working hours/daylight hours; and - a detailed CTMP(s) will be produced in substantial accordance with the fCTMP (Appendix 18D: fCTMP (ES Volume III, Appendix Ref. 6.3)) to manage the sustainable delivery of goods and materials. Operation - only use cutting, grinding or sawing equipment fitted, or in conjunction with, suitable dust suppression techniques, such as water sprays or Local Exhaust Ventilation (LEV) systems; - ensure an adequate water supply on the Site for effective dust suppression, using non-potable water or recycled water where practicable and appropriate; - use enclosed chutes and conveyors and covered skips; - minimise drop-heights from loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and - ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. Waste management - No bonfires and burning of waste materials. Prohibition of open fires on site. Earthworks - in corridors off the Main Site, re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable;	

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	• use Hessian, mulches or tackifiers where it is not practicable to revegetate or cover with topsoil, as soon as practicable; • only remove the cover in small areas during work and not all at once; and • minimise, to the extent practicable, duration of storage of topsoil or spoil during pipeline construction. Construction • avoid mechanical roughening or grinding of concrete surfaces, where appropriate and reasonably practicable; • ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place; • store sand and aggregates in bunded areas and store cement powder and fine materials in silos, where appropriate and reasonably practicable; and • for small supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust. Trackout • restrict, where practicable, the use of unmade road accesses; • to the extent appropriate and practicable, use water suppression and regular cleaning to minimise mud on roads, and control dust during earth moving activities; • use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site. This may require the sweeper being continuously in use; • avoid dry sweeping of large areas; • ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;	

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	- inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; - record all inspections of haul routes and any subsequent action in a Site logbook; - ensure haul routes are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowzers and regularly cleaned; - implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable); and - ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever Site size and layout permits.	

Table 3.2 Geology and Soils

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Mobilising existing contamination in soil and groundwater as a result of ground disturbance and potential dewatering during construction. Increasing the potential for contaminants in unsaturated soils to leach to groundwater in open excavations during construction. Increase the potential for contaminated surface run-off to migrate to surface water and groundwater receptors as a result of leaching from uncovered stockpiles. Introducing new sources of contamination such as fuels and oils used in construction plant. Creating preferential pathways for the migration of soil contamination and gases, for example, along new below ground service routes, service ducts and as a result of potential de-watering.	The detailed CEMP will include the following: - measures to ensure compliance with relevant standards and legislation; - environmental mitigation requirements and the project expectations on how the Proposed Development will be constructed; - measures to limit the potential for dispersal and accidental release of potential contaminants, soil derived dusts and uncontrolled run-off during construction; and - how material will be excavated, segregated and stockpiled to minimise the potential for run-off, soil quality degradation and wind dispersal of dust. Mitigation measures will include: - preparation of a ground investigation and risk assessment prior to construction, with remediation strategies developed as appropriate to deal with contamination risks. This will be undertaken in accordance with LCRM Guidance [Ref 6]; - promotion of sustainable reuse of excavated made ground and natural soils within the Proposed Development or at a receiver or hub site. Where soils are intended to be reused, earthworks would be undertaken in accordance with either a CL:AIRE Definition of Waste Code of Practice [Ref 8] Materials Management Plan (MMP) prepared by the EPC Contractor(s) or environmental permit; - pollution prevention controls to protect underlying soils and groundwater, with reference to the Environment Agency's (EA) Groundwater Protection Guidance [Ref 9], including how impacts on the River Tees will be managed during construction (e.g. spill kit training and toolbox talks). A foundation or piling risk assessment (in accordance with CL:AIRE guidance [Ref 7]) will be prepared prior to ensure associated risks are mitigated;	Records of contamination identified, results of sampling and risk assessment and the proposed method for remediation will be documented and submitted to the local planning authority Contaminated Land Officer and the EA.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Temporary effects during the construction period from ground disturbance.	• preparation of a surface water drainage strategy to limit any contaminated run-off from entering surface watercourses, including ensuring stockpiled materials are kept to a minimum as far as is reasonably practicable and stored away from watercourses; • preparation of a Health and Safety Plan; • preparation of an Incident Response Plan; and • delivery of spill kit training and toolbox talks. During earthworks the potential exists that previously unidentified soil and groundwater contamination may be exposed. The EPC Contractor(s) will implement a watching brief for managing unexpected contamination identified during excavations. In the unlikely event that contamination is encountered that is not consistent with the risk assessment and observations from any intrusive ground investigations this will be identified as unexpected contamination and the following procedures implemented: • works should cease in the area affected and the area cordoned off; • a competent geoenvironmental specialist should be consulted who will advise on next steps; • contaminated material should be sampled and tested, either in-situ in the ground (and left undisturbed while the samples are test and results interpreted) or if safe to do so excavated and stockpiled separately in an appropriate manner (i.e. bunded, covered, placed on an impermeable membrane and away from surface watercourses); and • measures should be taken to ensure protection of Site staff, neighbours and the environment, particularly by controlling dust and surface water runoff from the contaminated area.	

Table 3.3 Terrestrial Biodiversity

Potential impact	Mitigation /enhancement measure	Monitoring requirement
Impacts on terrestrial features of statutory designated sites (e.g. Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI)). Impacts on terrestrial features of Local Nature Conservation (e.g. Coatham Marsh Local Wildlife Site (LWS)). Impacts through habitat losses and disturbance. Impacts on water quality as a result of construction activities. Impacts on protected species (including bats, amphibians, breeding birds, wintering birds, otter, water vole). Potential for obtrusive glare and light spill to impact on ecology. Potential for spillages to enter watercourses and impact ecology. Dust deposition on sensitive ecological receptors. Spread of invasive species during construction.	- trenchless technologies will be used for crossings where reasonably practicable to minimise effects on habitats and species; - the Proposed Development will involve pipelines crossing the River Tees, which lies within the Teesmouth and Cleveland Coast SSSI / Special Protection Area (SPA) / Ramsar. These crossings will use either existing pipelines or an existing tunnel under the River Tees, removing the need for additional crossings and impacts to the designated sites; and - permanent habitat losses in pipeline corridors will be minimised through compliance with the requirements of NPS EN-4 (the requirement for post construction reinstatement of habitats) [Ref 10]. The reinstatement of habitat post-construction will be in line with the Framework Landscape and Biodiversity Management Plan (fLBMP) (Application Document Ref. 5.8). Mitigation measures include: - habitat clearance will be limited to areas needed to facilitate construction works, with areas of existing vegetation around Site margins being retained; - protective fencing will be used where necessary to demarcate habitats to be retained and prevent access from construction plant and operatives; - work areas adjacent to sensitive habitats (e.g. those used by breeding/wintering birds) will require visual and noise screening on perimeter fences to reduce visual and noise disturbance; - implementation of an invasive species management plan will be developed to prevent the spread of Invasive Non-Native Species (INNS) of flora and fauna during construction;	An ECoW will carry out checks of habitats prior to any clearance works to determine whether any protected features (such as bird nests and burrows) are present. The survey will also identify any locations of INNS to inform the invasive species management plan. An ECoW presence and sound level monitoring at work areas adjacent to sensitive habitats is required to monitor animal behaviour and ensure works do not exceed the threshold for disturbance (55dB) and/or disturb sensitive ecological features. Any works requiring vegetation clearance during the breeding bird season (March to August inclusive) must be done under the supervision of an ECoW. If an active bird's nest is found an appropriately sized, based on the species, no-works buffer zone will be placed around it until the nest has fledged and is no longer active. The ECoW may require that works are relocated or

Potential impact	Mitigation /enhancement measure	Monitoring requirement
	- the construction programme will be kept to the minimum amount of time needed to complete the works, in order to minimise the temporal extent of disturbance to ecological receptors; - sensitive timing and programming of construction will aim to avoid and then minimise impacts upon ecological features. For example, vegetation clearance will not occur from March to August (inclusive) to avoid the breeding season for most protected and/or notable fauna species. Where certain sensitive periods cannot feasibly be avoided, the use of visual and acoustic screening will be developed and employed during construction to avoid disturbance to nearby ecological features; - if temperatures of zero degrees Celsius (or lower) occur at the Proposed Development, at any point within a 24-hour period, for five consecutive days leading up to or during the works period, all noisy construction works within 200m of locations with significant populations of qualifying features of the Teesmouth and Cleveland Coast SPA/Ramsar/SSSI will be suspended. These locations include connection corridor works west of the Navigator Foreshore and along the north and south banks of Dabholm Gut. Once temperatures have not dropped to zero degrees Celsius or below for three consecutive days then works will recommence; - soft-start techniques for plant and equipment to minimise loud, percussive noises most disturbing to birds, will be secured via a Construction Noise and Vibration Management Plan (CNVMP) where relevant; - careful selection of plant and machinery, access routes and construction methods, the use of noise and visual reduction measures/barriers on operational plant machinery, equipment and vehicles, and timing works to reduce unnecessary noise in areas that are not being utilised for construction purposes, to be secured via a CNVMP where relevant;	delayed to avoid impacts on breeding birds or any other protected species Updated surveys will be required for protected/notable species if construction works commence more than 18 months after DCO submission as new features could have developed.

Potential impact	Mitigation /enhancement measure	Monitoring requirement
	• where reasonably practicable, fixed items of construction plant shall be electrically powered in preference to combustion engine driven to reduce air quality and noise impacts; • dust suppression measures, to be secured via a DMP where relevant; • materials for night-time working shall be delivered, where practicable, during normal hours of working and be placed as close as practicable to the work area for which they are required; • good industry practice measures for pollution prevention to minimise impacts on surrounding habitats, such as a suitable drainage design, safely storing chemical/fuels, use of silt fences, avoiding earthworks during wet weather, and storing sub/top soil at least 20m from watercourses. These measures will be secured by a detailed Drainage Strategy (to align with the Framework Drainage Strategy prepared as part of this DCO Application (Application Document Ref. 5.7)), and will be developed in line with the Control of Water Pollution from Construction Sites [Ref 11] and as agreed with the relevant authorities; • early revegetation of the completed elements of the construction area should be undertaken to reduce the risk of erosion and dust emissions; • implementation of a detailed Lighting Strategy (developed to align with Appendix 13C: Framework Lighting Strategy (ES Volume III, Application Document Ref. 6.3)). The measures within this document will align with the Bat Conservation Trust guidance [Ref 12] regarding artificial lighting.	

Table 3.4 Freshwater and Marine Ecology

Potential impact	Mitigation /enhancement measure	Monitoring requirement
Change of intertidal habitats and species associated with jetty demolition. Loss of subtidal habitats and species from construction works. Changes to water quality associated with existing jetty demolition and quay construction works (piling, dredging and navigation). Changes to water quality associated with chemical discharges from surface water run-off. Changes to water quality associated with spillage of fuels. Disturbance to marine mammals and fish associated with underwater noise. Disturbance to marine mammals and fish associated with changes in visual stimuli Increase in vessel collision risk associated with vessel traffic. Introduction and spread of marine INNS.	Mitigation will be in line with: • International Convention for the Control and Management of Ships' Ballast Water and Sediments with the aim of preventing the spread of marine INNS [Ref 13]; • International Maritime Organisation (IMO) Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species (Biofouling Guidelines) [Ref 14]; • International Regulations for Preventing Collisions at Sea [Ref 15] and regulations relating to International Convention for the Prevention of Pollution from Ships (the MARPOL Convention 73/78); and • relevant Environmental Permits, good practice guidance and Regulations, British Standards and any relevant species licences (for example marine wildlife licence for activities effecting a protected species). All vessels shall have a contingency plan for marine oil pollution with a Shipboard Oil Pollution Emergency Plan and local emergency response plans. Biosecurity management measures will be implemented in accordance with the detailed CEMP to prevent the spread of INNS activities associated with the Proposed Development, in accordance with the standard international guidance, including managing ballast water and hull fouling in accordance with the Ballast Water Management and Biofouling Guidelines [Ref 14]. The Ballast Water Management Convention requires all ships in international trade to manage their ballast water and sediments, according to a ship-specific ballast water management plan. All ships must carry a ballast water record book and an International Ballast Water Management Certificate. All project vessels shall adhere to the International Convention for the Control and Management of Ships' Ballast Water and Sediments with the aim of preventing the spread of marine INNS. All vessels used during construction shall adhere to the International Maritime Organisation	Commissioning of pipelines will involve pressure testing using water or nitrogen. If no additives are used, following testing to confirm safety, water will be discharged to the surface water drainage system and then the River Tees if clean and with the consent of the Environment Agency. If the water is contaminated with additives, such as glycol, it will be tankered off-site for treatment and disposal. Turbidity monitoring will be employed to ensure turbidity remains within acceptable levels during dredging activities Water quality monitoring will be carried out to enable management and mitigation of potential effects from construction methodologies on marine ecological receptors. Periodic ecological monitoring will be carried out in association with Natural England to identify

Potential impact	Mitigation /enhancement measure	Monitoring requirement
	(IMO) 2023 Guidelines for the control and management of ships' biofouling to minimise the transfer of invasive aquatic species (Biofouling Guidelines), following inspection and cleaning procedures [Ref 15]. A Construction Surface Water Management Plan (CSWMP) will be produced to outline a temporary drainage and runoff strategy, a pollution prevention plan, and an emergency response plan. Main Site construction mitigation measures include: • a minimised construction footprint where feasible, through the selection of options which require less intrusion into the marine environment. This includes construction works at the quay seeking to minimise underwater noise and loss of habitat resulting from piling and dredging; • visual monitoring of seals during construction works in the River Tees; • use of JNCC guidelines for minimising impacts from piling (and also geophysical surveys and UXO detonation if required), such as piling location restrictions, marine mammal visual monitoring, passive acoustic monitoring, a soft start and, if appropriate, measures such as bubble curtains – details of the methods to be employed will be agreed with relevant stakeholders at the detailed design stage as part of the detailed CEMP; • construction activity that may cause direct disturbance to the marine environment (such as piling) will not commence unless an ECoW is present to monitor seals in the vicinity of works; • jetty demolition would include extraction of existing or, if not feasible, cutting piles down to a level where the stumps could not pose a risk; • dredging will use the most appropriate methods to reduce sediment resuspension and where applicable, contain contaminated sediments to prevent liberation into the marine environment. Timing of dredging will also be scheduled to avoid spring tides and the ebb flow to reduce potential sediment distribution. Turbidity monitoring will also be implemented;	colonisation/spread of marine INNS.

Potential impact	Mitigation /enhancement measure	Monitoring requirement
	• suitably bunded and lined locations will be identified as storage areas for any hazardous or polluting materials and chemicals, to control the risk of pollution; • risk analysis and inclusion of preventative measures to minimise the risk of changes to water quality associated with accidental chemical or fuel discharges into surface water run-off. Further detail to be provided as part of the detailed CEMP; • any accidental fuel, oil or chemical spillages that enters the River Tees will be reported as soon as practicable to the relevant authorities, including PD Ports and the Environment Agency, and responded to in accordance with the Shipboard Oil Pollution Emergency Plan (SOPEP) and local emergency response plans. The implementation of these regulatory requirements and best practice measures will ensure that the risk of fuel or harmful substance spillage, and any associated environmental impact on the Tees Estuary, is reduced as far as reasonably practicable; • use of sensitive lighting where any night work is required, with light spill onto marine environment minimised; • the drainage systems will incorporate pollution control systems designed in line with the Control of Water Pollution from Construction Sites [Ref 11] agreed with the relevant authorities; and • storage areas for flammable/ toxic corrosive materials will be located in a separate, locked, bunded and fenced off area within the Main Site. The Framework Lighting Strategy (Appendix 13C: Framework Lighting Strategy, ES Volume III, Application Document Ref. 6.3) includes measures to minimise and control the impacts of artificial lighting on the marine environment. Mitigation measures associated with marine navigation are included in the Navigation Risk Assessment (Appendix 20A: Preliminary Navigation Risk Assessment, ES Volume III, Application Document Ref. 6.3).	

Table 3.5 Greenhouse Gas Emissions Climate and Change Resilience

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Greenhouse Gas (GHG) emissions from construction traffic, equipment and materials	- reusing suitable infrastructure and resources already available within the Site, where practicable, to minimise the use of natural resources and unnecessary materials (for example, reusing excavating soil for fill requirements or storing, preserving and restoring top soil where present); - encourage the use of construction materials with lower embodied carbon (such as higher recycled content); - increasing recyclability by segregating construction waste to be re-used and recycled, where reasonably practicable; - prohibition of on-site burning of waste materials; - conducting regular planned maintenance of the construction plant and machinery to optimise efficiency; - preparation and implementation of a Site Waste Management Plan to minimise waste generation and promote reuse and recycling; and - implementation of construction transport measures, including a fCTMP and a fCWTP (Appendix 18D and Appendix C to Appendix 18A respectively, ES Volume III, Application Document Ref. 6.3), to minimise vehicle movements and promote sustainable transport options (e.g. shared transport and encouraging cycling).	To be confirmed in the detailed CEMP, CTMP and CWTP.
Increased frequency and intensity of extreme weather events	health and safety plans and risk assessments developed for construction activities will be required to account for potential climate change impacts on workers, such as flooding and heatwaves. This will include for the provision of flood defence equipment (such as sandbags) on-site and good practice health management measures for construction staff working in heat, such as wearing loose clothing, staying hydrated and applying sun protection;	Regular monitoring of weather forecasts for extreme conditions and activation of response plans (as needed) to reduce risks to the Proposed Development from heatwaves, heavy rainfall, and strong winds during the construction phase.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	- protecting workers and resources from extreme weather conditions through appropriate PPE and working practices; - using equipment's cooling systems where necessary / adapting working practices and equipment used based on current weather conditions; and - monitoring weather forecasts and news for EA flood warnings, relevant weather warnings, and water levels of the local waterways.	A record of extreme weather incidents impacting construction of the Proposed Development (such as road surface damage, flooding, snow, ice) to help identify thresholds that trigger maintenance. Post-event inspections should follow intense rainfall or other extreme conditions to assess damage and apply necessary mitigation. Conduct regular inspections of drainage systems, materials and structures to identify signs of deterioration. Additional checks should be carried out after extreme weather events (e.g. flooding, heatwaves, droughts, storms) with repairs or replacements scheduled as needed.

Table 3.6 Landscape and Visual Amenity

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Temporary impacts during construction on sensitive receptors.	Lighting will be designed to include shielded and directional luminaires to limit the amount of light spill. This is outlined in the Framework Lighting Strategy (Appendix 13C: Framework Lighting Strategy, ES Volume III, Application Document Ref. 6.3) .	Refer to detailed CEMP and detailed Lighting Strategy for further information on appropriate mitigations.

Table 3.7 Major Accidents and Disasters

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Major Accident and Disasters, such as fire or explosion including through disturbance of Major Accident and Hazard (MAH) pipelines which are within the Site (Linkline) and/or leaks and spillages of chemicals or fuels resulting in contamination or release of hazardous substances to the environment.	All works will be undertaken in accordance with relevant Health and Safety legislation and guidance. Details of fire, policy, emergency services and hospitals will be publicised and included in the Site induction. The relevant risk assessments for safety during construction will be required and produced by the EPC Contractor(s) prior to construction, which will be implemented to minimise the risk of accidents and disasters on-site. Consultation with pipeline operators and preparation of method statements for working near any MAH pipelines will be undertaken prior to works. Utility searches and identification (including utilising ground penetrating radar before excavation to identify any unknown utilities) will be undertaken prior to any physical works commencing. Consultation with appropriate agencies, (such as National Grid, National Grid Gas, Northern Endurance Partnership and the EA) will be undertaken to manage interfaces and define appropriate control measures. A CSWMP will be produced to outline a temporary drainage and runoff strategy, which will be implemented throughout construction. Site emergency arrangements will be implemented and the Proposed Development will interface with local responder plans. During construction, the Proposed Development will implement safe working distances and exclusion zones from other infrastructure. The programming of construction works (including the quay construction and heavy lifting activities) will avoid adverse weather conditions where practicable. Further risks of major accidents and disasters are covered in the other tables in this document relating to Hydrology, Flood Risk and Drainage, Transport and Access, Ground Conditions, Human Health and Other Environmental Matters.	Consultation with the pipeline operators, utility stakeholders and Health and Safety Executive (HSE) required prior to any physical works. The EPC Contractor(s) will monitor the weather conditions/ predictions and flood alerts.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	Mitigation measures associated with marine navigation are included in the Navigation Risk Assessment (Appendix 20A: Preliminary Navigation Risk Assessment, ES Volume III, Application Document Ref. 6.3) .	

Table 3.8 Noise and Vibration

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Noise and vibration due to construction activities impacting Noise Sensitive Receptors (NSRs), including construction traffic, plant and machinery noise.	The EPC Contractor(s) will conduct works in line with Best Practicable Means (BPM) as defined in the Control of Pollution Act 1974 (CoPA) [Ref 16]. The following Best Practicable Means (BPM), based upon BS 5228-1:2009+A1:2014 [Ref 19], will be applied during construction works to minimise noise and vibration at NSRs: - careful selection of plant and construction methods. Only plant conforming to relevant national, EU or international standards, directives and recommendations on noise and vibration emissions will be used; - design and use of Site enclosures and temporary stockpiles, where practicable and necessary, to provide acoustic screening at the earliest opportunity; - choice of routes and programming for the transport of construction materials, spoil and personnel; - careful programming so that activities which may generate significant noise are planned with regard to local occupants and sensitive receptors; - all vehicles and mechanical plant shall be fitted with effective exhaust silencers (without causing the engine to overheat nor interfere excessively with routine operations) and shall be maintained in good and efficient working order and operated to minimise noise emissions; as recommended by the manufacturers;	The detailed CEMP will set out a scheme for the provision of information to the local planning authority and local residents to advise of potential noisy works that are due to take place and for monitoring of noise complaints and reporting to the Applicant for immediate investigation and action. Where relevant, the EPC Contractor(s) will carry out noise and/or vibration monitoring during peak periods at the receptors most likely to be impacted. Details of the monitoring strategy will be developed for the detailed CEMP.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	- all machines in intermittent use will be shut down in the intervening periods between works or throttled down to a minimum. Lorry engines will be switched off, as soon as practicable, when vehicles are stationary; - all compressors and generators shall be sound reduced models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers that do not impair machine efficiency; - noise emitting equipment which is required to run continuously will be housed in a suitable acoustic enclosure (refer to BS 5228 Part 1, Figures B.1, B.2 and B.3 [Ref 19]); - temporary noise barriers will be used to reduce noise levels where appropriate and practicable. Such measures can be particularly appropriate for stationary or near-stationary plant such as pneumatic breakers, piling rigs and compressors. Barriers should be located as close to the plant as possible and, in order to provide adequate attenuation, should have a mass per unit area of at least 7 kg/m²; - plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors and away from walls reflecting towards sensitive receptors; - where night working is required and (with the exception of emergency works) agreed with the local planning authority, materials for night-time working shall be delivered, where practicable, during normal hours of working and be placed as close as practicable to the work area for which they are required; - where reasonably practicable, fixed items of construction plant will be electrically powered in preference to combustion engine driven; - equipment will be optimally located within the Proposed Development to minimise noise disturbance;	

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	• use of less intrusive alarms, such as broadband vehicle reversing warnings; • contact details will be provided for local residents along the HGV access routes in case of complaints; and • a requirement in the draft DCO will secure both working hours and the approach to exceptions to these hours.	

Table 3.9 Socioeconomics

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Increase in local employment arising from indirect and induced effects of the construction activity.	The construction of the Proposed Development is anticipated to generate direct, indirect and induced employment opportunities, which are likely to give rise to a significant beneficial effect. An employment and skills plan will be prepared prior to commencement of construction (save for preliminary works) (secured by a Requirement in Schedule 2 of the draft DCO (Application Document Ref. 3.1)). Practicable opportunities to promote local recruitment and procurement, education and skills uplifting, and apprenticeship and training schemes for construction, manufacturing, and the energy industry are to be explored. Employment benefits will be maximised through local recruitment efforts, including engagement with Job Centre Plus, local planning authority, and recruitment agencies. The Applicant will also introduce measures to promote workforce diversity, equality, and inclusion, targeting underrepresented groups such as women in construction, young people and the long-term unemployed.	To be confirmed in the detailed CEMP.
Additional demand for housing	The EPC Contractor(s) will provide support for construction workers to find suitable accommodation, either in the form of private rental accommodation, or hotels, or other serviced accommodation (such as furnished apartments for short-to-medium term stays), in locations where impact upon existing residents and visitors can be minimised.	To be confirmed in the detailed CEMP.
Disruption to users of Public Rights of Way, cycle routes and other recreational amenities	It is not anticipated that the construction phase will require stopping up or temporary diversions of PRoW with the exception of footpath 116/31 in South Tees. This runs between the eastern end of the Dabholm Gut and BOC Ltd. Middlesborough, where short-term temporary closure and diversion may be required during the construction of the industrial gases pipeline connection in this area. Crossing controls may also be required where the King Charles III England Coast Path crosses the access to the track following the Sembcorp Corridor along the A178, just south of the Seal Sands roundabout.	To be confirmed in the detailed CEMP.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Disruption to the local travel network	The detailed CTMP will set out that additional signage will be adopted to enforce preferred HGV and construction traffic routes, particularly where non-compliance would cause adverse effects to sensitive receptors.	To be confirmed in the detailed CEMP.
Construction noise and increased traffic movements impacting sensitive receptors	A detailed noise assessment will be carried out once the EPC Contractor(s) is appointed and further details of construction methods are known, in order to identify specific mitigation measures (including construction traffic).	To be confirmed in the detailed CEMP.

Table 3.10 Traffic and Movement

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Increased traffic flows, including HGVs on the roads leading to the Site. Local disruption to traffic routes surrounding the Site and surrounding residential areas.	Mitigation measures include: • implementation of a Construction Worker Travel Plan (CWTP) which includes measures and procedures to encourage construction workers to adopt modes of transport which reduces reliance on single occupancy private car use (a fCWTP is provided in Appendix C to Appendix 18A: Transport Assessment, ES Volume III, Application Document Ref. 6.3); • liaison with the EPC Contractor(s) for the potential to implement construction worker minibuses and car sharing options (included in the fCWTP (Appendix C to Appendix 18A: Transport Assessment, ES Volume III, Application Document Ref. 6.3)); • implementation of a CTMP to control the impact of HGVs on the local road network during construction (a fCTMP is provided as Appendix 18D, ES Volume III, Application Document Ref. 6.3); • working with suppliers to ensure that all relevant materials (including chemicals) brought to the Site that are classified as hazardous are transported in compliance with applicable regulations including the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG Regs) (Ref 17), during construction, commissioning and operational phases. This will include, for example, consignments being marked with the familiar "Emergency Access Codes" and including a telephone number for advice in the event of an emergency; • management of delivery timing to minimise interaction with peak traffic conditions, including the potential use of off-peak or night-time deliveries where practicable. This approach will be secured through the CTMP and is facilitated by the location of the Main Site within an industrial area with limited nearby residential receptors. By reducing the overlap between construction traffic and peak period commuter	The EPC Contractor(s) will review options for the use of water transport when sourcing construction materials. The EPC Contractor(s) will review the use of minibuses for construction staff accessing the Site.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	flows, this measure further limits the potential impact on the surrounding highway network.	

Table 3.11 Water Resources and Flood Risk

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Leakage or accidental spillage of construction materials and potential pollutants used on-site, migrating to nearby surface watercourses or infiltrating groundwater. Disturbance of sediments which temporarily increase turbidity within the water column, resulting in mobilisation of sediment-bound contaminants and changes to hydromorphological processes. Impacts on groundwater levels, flow pathways and water quality. Any flooding during construction could flood construction equipment materials, causing release of pollutants to nearby surface watercourses or infiltrating to groundwater.	Surface water quality and contamination mitigation measures include: - undertaking a ground investigation and risk assessment prior to construction, with remediation strategies developed as appropriate to manage contamination risks with respect to surface water receptors; - during construction, a surface water drainage strategy will be implemented to limit any contaminated run-off from entering surface watercourses. Rainfall runoff from areas where there is a risk of contamination will be managed using temporary drainage systems and/or tankered off-site for treatment (including settlement of suspended solids and/or oil interceptors) prior to discharge to local watercourses with the approval of the EA pursuant to a discharge licence. The drainage systems will incorporate pollution control systems designed in line with the Control of Water Pollution from Construction Sites – Guidance for consultants and contractors C532 [Ref 18] (or as agreed with the relevant authorities). Foul flows and effluent arising from the Proposed Development will be kept separate from the surface drainage network and will be sent to off-site for treatment; - stockpiled materials will be kept to a minimum as far as is reasonably practicable and stored away from watercourses. If necessary, suitable measures will be put in place to prevent sediment being washed outside of the Site, and the stockpiles will be monitored/checked during periods of high rainfall or flooding. Any suspected contaminated material encountered during earthworks will be segregated and placed on an impermeable membrane to prevent leaching of contaminants; - water at a higher risk of contamination which requires discharge, for example groundwater pumped out of excavations or during concrete pouring, will be contained and treated using appropriate measures. Examples of these measures may include one or more of the following: coagulation of sediments, dewatering, and pH neutralisation prior to discharge;	A water quality monitoring programme (sampling plan) prior to and during construction works must be established. Monitoring of weather forecasts and flood warnings to inform construction activities.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	• use of heavy machinery near waterbodies must be minimised, as far as reasonably practicable (unless works are required to interface with the river environment to construct the Proposed Development). Refuelling of machinery and heavy goods vehicles must take place in bunded areas with a minimum 10m buffer from surface water features and drainage assets; • all entry and exit points must have wheel wash facilities in place with machinery cleaned in accordance with best practice, relevant guidance and approved Flood Risk Activity Permit (FRAP) if applicable; • drip trays must be used under machinery at risk of leaks or spillages to prevent contaminated runoff from polluting nearby surface water features. High-risk areas for spillage should be located as far from surface water features as practicable to minimise environmental impact; • hazardous substances must be contained within fully bunded (and lined) impermeable areas with adequate storage capacity plus an appropriate safety margin; • concrete washout must take place in designated washout areas, and construction materials such as cement must be mixed a suitable distance from surface water features; • reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing waterbody during construction taking into account relevant industry guidelines including CIRIA C532: Control of water pollution from construction sites [Ref 18]. This may typically include use and maintenance of temporary lagoons, tanks, seeding/covering of earth stockpiles, earth bunds, straw bales and sandbag walls, other proprietary measures, fabric silt fences or silt screens and consideration of the type of plant used; • where reasonably practicable, earth moving works will seek to avoid periods of very wet weather, to minimise the risk of generating runoff contaminated with fine particulates. Where this is not reasonably	

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	practicable, mitigation measures will be implemented to control fine sediment laden runoff; - to protect waterbodies from fine sediment runoff, topsoil/subsoil should be stored a minimum of 20m from watercourses on flat lying land (and further where any ground is sloping). Where this is not reasonably practicable and material is to be stockpiled for longer than two weeks, any runoff from the stockpile should be prevented from draining to any watercourses, without prior treatment; - a Emergency Response Plan will be produced and implemented; - a Flood Warning and Evacuation Plan will be produced and implemented; and - spill kit training and toolbox talks will be provided to construction workers. Hydromorphology and sediment disturbance mitigation measures include: - all dredged material will be disposed of at designated and licensed offshore disposal sites, such as Tees Bay A and C, under a Deemed Marine Licence. Drainage and overland flow pathways mitigation measures include: - a surface water drainage strategy will be implemented during construction to maintain existing drainage pathways, manage runoff and prevent uncontrolled discharge from the Site; - drainage measures will be designed to capture, convey and attenuate runoff, including provision of temporary drainage features such as channels, attenuation areas, settlement lagoons or tanks, as appropriate; - exceedance flows will be managed safely, with overland flow routes maintained or replicated where practicable to prevent diversion of flows in a manner that could increase flood risk off-site. Groundwater levels, flow pathways and water quality mitigation measures include:	

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	- ground investigation and risk assessment prior to construction, with remediation strategies and verification plans developed and implemented as appropriate to deal with any contamination risks; - a foundation or piling risk assessment will be produced to ensure any associated risks are mitigated; - pollution prevention controls to protect groundwater, with reference to the EA's Groundwater Protection Guidance [Ref 9], including how impacts on the River Tees will be managed during construction (such as spill kit training and toolbox talks); - a Emergency Response Plan will be produced and implemented; - a Flood Warning and Evacuation Plan will be produced and implemented; - spill kit training and toolbox talks will be provided to construction workers; - temporary dewatering may be required during construction, however this would be non-consumptive and temporary in nature, and would be undertaken in accordance with relevant licences and permits required by the EA; and - implementation of containment measures (such as cut-off trenches, low permeability barriers or temporary linings) where necessary to prevent mobilisation of contaminants and protect underlying groundwater, taking into consideration mounding. Flood risk mitigation include: - works will be planned to avoid periods of elevated flood risk, with activities suspended during out-of-bank flows or intense rainfall events; - a site-specific flood response approach will be implemented, including monitoring of weather forecasts and flood warnings to inform construction activities; - temporary works and construction areas will be located, where practicable, outside areas of highest flood risk to reduce exposure;	

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	- with the exception of revetment removal associated with the quay works, existing flood defence infrastructure will either be retained and protected or works within 16 m will be subject to FRAP and maintaining access for maintenance; - the flood defence function and standard of protection (up to the 2105 0.5% AEP standard) of existing flood defence infrastructure will be retained and protected, with works within 16 m subject to FRAP and maintaining access for maintenance; and - a surface water drainage strategy will be implemented during construction to manage runoff, reduce pluvial flood risk, and ensure no increase in flood risk elsewhere.	

Table 3.12 Materials and Waste

Potential impact	Mitigation/enhancement measure	Monitoring requirement
Impacts of waste to the surrounding environment. Potential to impact on sensitive receptors (human, wildlife and controlled waters) if not stored and managed appropriately.	Materials - materials selected will be durable to ensure long life and reduced need for replacement; - materials will be appropriately handled and stored throughout their lifecycle from delivery to inclusion, such as return surplus materials to storage; - materials will be delivered to the Proposed Development 'just-on-time', this will limit the need for excess storage within the Proposed Development and will limit the chance of wastage through damage of the stored materials; - there will be designated areas for the segregated storage of materials; and - re-use packaging by returning to supplier/manufacturer or using it for other purposes (such as timber packaging pallets can be chipped and used for landscaping top mulch). Waste The EPC Contractor(s) will consider the objectives of sustainable resource and waste management and seek to use material resources efficiently, reduce waste at source, reduce waste that requires final disposal to landfill and apply the principles of the waste hierarchy. This will include, where reasonably practicable, working towards a cut-and-fill balance for excavations, segregation of construction materials on-site for appropriate re-use, recycling and recovery with landfill as a last resort. This will be achieved by a combination of measures, including: - a detailed SWMP (in accordance with Appendix 5B: Framework Site Waste Management Plan, ES Volume III, Application Doc Ref. 6.2) will be prepared before commencement of construction and will be	The types, quantities and final destination of waste generated during the construction phase would be identified, measured and recorded through the SWMP. A register of all waste loads leaving the Site would be maintained to provide a suitable audit trail for compliance purposes and to facilitate monitoring and reporting of waste types, quantities and management methods.

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	implemented by the EPC Contractor(s), once appointed. During construction the SWMP will be updated by the EPC Contractor(s); - all waste transported off-site will be delivered to the appropriately permitted waste management site; and - as part of the SWMP, the EPC Contractor(s) would segregate construction waste to be re-used and recycled, where reasonably practicable. To minimise impacts of waste on the surrounding environment, the following measures would be implemented: - off-site pre-fabrication, where reasonably practical, including the use of pre-fabricated structural elements, cladding units, mechanical and electrical risers and packaged plant rooms; - burning of waste or unwanted materials would not be permitted on-site; - all hazardous materials including chemicals, cleaning agents and solvent containing products to be properly sealed in sealed containers at the end of each day prior to storage, in appropriately protected and bunded storage areas; - materials requiring removal from the Site would be transported using licensed carriers and records kept, detailing the types and quantities of waste moved and the destinations of this waste, in accordance with the relevant regulations; - the provision of pre-fabricated welfare units and construction site offices also allows for the reduction of construction and demolition waste generated by the Proposed Development as they can be reused on other construction projects; - the Proposed Development will strive to implement good industry practice with regard to the segregation of waste by adopting the Considerate Constructors Scheme (CCS) colour coding system on waste skips; - the EPC Contractor(s) shall establish a waste storage and recycling area for the safe storage and processing of recovered materials to	

Potential impact	Mitigation/enhancement measure	Monitoring requirement
	ensure that opportunities for re-use, recycling and recovery are maximised; - hazardous waste shall be correctly labelled, securely contained and not be mixed with non-hazardous waste; and - early contact with waste management EPC Contractor(s) and facilities would be made to notify them of the quantities and timings of Construction Demolition and Excavation (CD&E) waste that would be generated to ensure they can plan and manage the waste appropriately.	

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