

The Lighthouse Green Fuels Order

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Abbreviations

Abbreviation	In full
AIL	Abnormal Indivisible Load
AIS	Automatic Identification System
ALARP	As Low as Reasonably Practicable
AtoN	Aids to Navigation
BHD	Backhoe Dredger
CD	Chart Datum
CHP	Combined Heat and Power
COMAH	Control of Major Accident Hazards regulations
CPA	Closest Point of Approach
CSU	Continuous Ship Unloader
DCO	Development Consent Order
DHM	Deputy Harbour Master
DWT	Deadweight Tonnage
EIA	Environmental Impact Assessment
ES	Environmental Statement
FTB	Flat Top Barge
GDs	General Directions
HGV	Heavy Goods Vehicles
HLV	Heavy Lift Vessel
HM	Harbour Master
ICW	In Collision With
IMO	International Maritime Organisation
JUB	Jack-up Barge
kt	Knot (unit of speed equal to nautical mile per hour, approximately 1.15mph)
LAT	Lowest Astronomical Tide
LGF	Lighthouse Green Fuels
LOA	Length Overall
LoLo	Load on, Load Off
m	Metre
MAIB	Marine Accident Investigation Branch
MCA	Maritime and Coastguard Agency
MHWS	Mean High Water Spring
MMO	Marine Management Organisation

MOF	Marine Offloading Facility
NM	Nautical Mile
NRA	Navigation Risk Assessment
NtM	Notice to Mariners
PAR	Pre-Assembled Racks
PDT	PD Teesport
PEC	Pilotage Exemption Certificate
PEIR	Preliminary Environmental Information Report
PMSC	Ports and Marine Facilities Safety Code
RNLI	Royal National Lifeboat Institution
RoRo	Roll on, Roll off
SAF	Sustainable Aviation Fuel
SAR	Search and Rescue
SHA	Statutory Harbour Authority
SPHB	Self-Propelled Hopper Barge
SPMT	Self-Propelled Modular Transporter
TCT1	Teesport Container Terminal 1
TCT2	Teesport Container Terminal 2
VTS	Vessel Traffic Service

1 Introduction

1.1 Background

- 1.1.1 This Navigational Risk Assessment (NRA) is an Appendix to the **Marine Navigation** chapter in the Environmental Statement (**Chapter 20, ES Volume I, Application Document Ref. 6.1**). This document is an update on a Preliminary NRA conducted to support the Preliminary Environmental Information Report (PEIR). The updated NRA takes into account some design amendments to the Proposed Development made following PEIR and feedback from the Section 42 Consultation.

1.2 Scope

- 1.2.1 An Environmental Impact Assessment (EIA) Scoping Opinion was received by the Applicant from the Planning Inspectorate ('the Inspectorate') on behalf of the Secretary of State dated 11 November 2025. The scoping responses from the Inspectorate in relation to marine navigation and how these matters should be addressed by the Applicant are set out in Section 20.3 of the **Marine Navigation** chapter in the Environmental Statement (**Chapter 20, ES Volume I, Application Document Ref. 6.1**).
- 1.2.2 This document is a structured Navigation Risk Assessment (NRA) prepared to the requirements of PDT as Statutory Harbour Authority (SHA) and in compliance with the UK Department for Transport Port and Marine Facilities Safety Code (PMSC) [Ref 1].
- 1.2.3 The NRA assesses three risk scenarios associated with the following phases of the Proposed Development marine operation:
- Phase 1: Construction of the quay (and demolition of the existing infrastructure) and dredging of the berth pocket and access channel – refer to Section 3.2 for further information;
 - Phase 2: Marine operations during the construction of the rest of the Proposed Development; - refer to Section 3.3 for further information; and
 - Phase 3: Marine operations during the operational phase of the facility (the import of biomass and waste wood feedstock via the quay) – refer to Section 3.4 for further information.

The phasing of works has not yet been finalised and there may be some overlaps once the detailed construction programme is produced.

- 1.2.4 Navigational impacts arising from the export of Sustainable Aviation Fuel (SAF) products during the operational phase of the Proposed Development

are not considered. This was agreed at a project kick-off meeting with PDT held on 3rd October 2025 and is documented in the meeting minutes in Annex A. The assumption is that SAF will be exported by existing third-party liquid cargo terminals which are licensed to export the product either via their existing marine facility/facilities or via Heavy Goods Vehicles (HGV) within Seal Sands Area.

- 1.2.5 In addition, activities during decommissioning of the Proposed Development have been scoped out of this NRA. This was agreed with the Harbour Master team at PDT.
- 1.2.6 Where appropriate the NRA identified suitable risk controls to reduce navigation risk to tolerable levels.

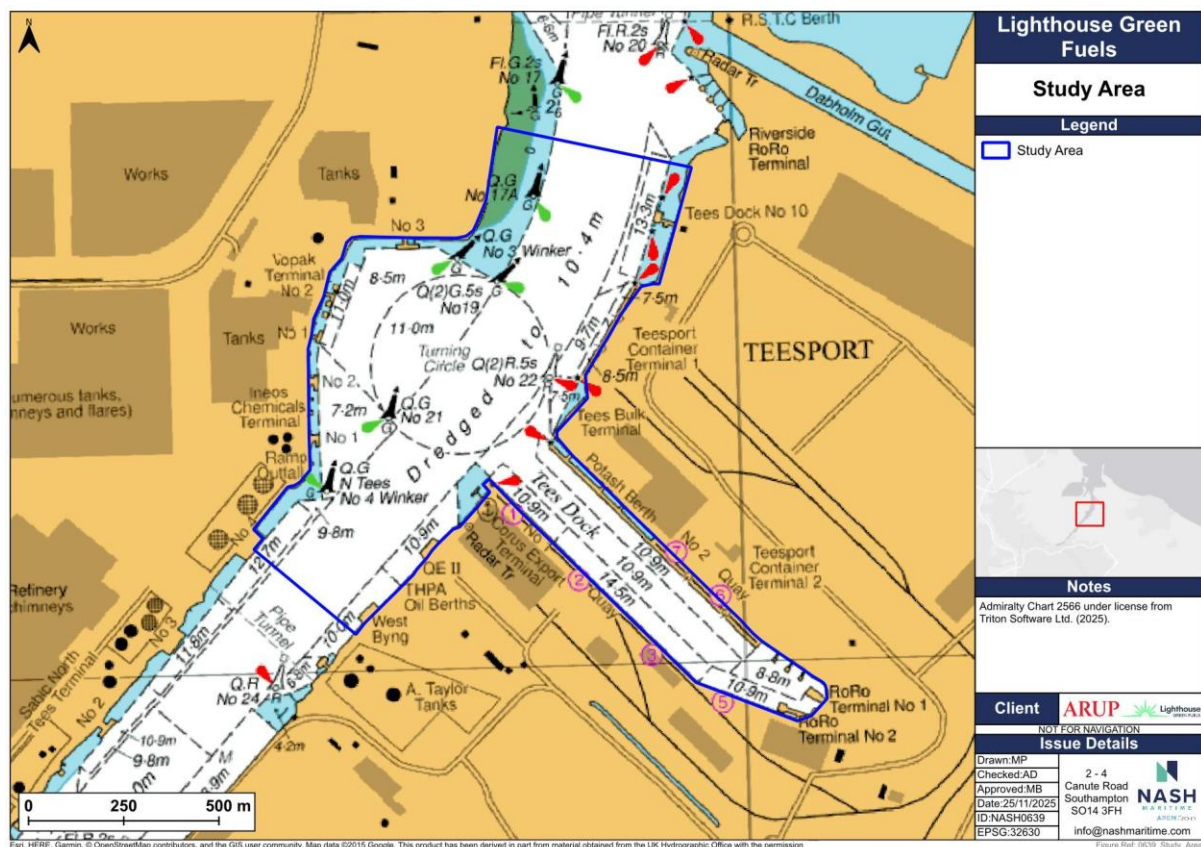
1.3 Rochdale envelope approach

- 1.3.1 It is recognised that the quay design, the construction and dredging methodology and the exact number of vessel movements and vessel types to arrive at the Proposed Development are not fully confirmed at this stage.
- 1.3.2 Therefore, the NRA has undertaken a 'Rochdale Envelope approach' whereby a precautionary worst-case scenario was assessed for each of the Proposed Development marine operations phases outlined in Section 1.2.3.
- 1.3.3 The precautionary worst-case assessment scenarios for each marine operation phase are outlined in Section 2.

1.4 Study area

- 1.4.1 The marine navigation study area is shown bounded in blue in Inset 1.1. The extent of the marine navigation study area was discussed and approved by the PD Teesport Harbour Master at an NRA kick-off meeting held on 3rd October 2025 (see Section 6.2).
- 1.4.2 The edition of the chart used in the plots within this NRA was updated in January 2026. There are only minor changes to the information within the study area, these being:
 - the navigable channel is now stated as having a 'Maintained depth' of 10.4 m in place of a 'Dredged to' depth of 10.4 m; and
 - some references to the riverside terminals and berths have been updated. For example, the former Vopak Terminal No.2 has changed to 'Navigator Terminals Seal Sands' and reference to the Harbo Chemicals Terminal has been removed.

The minor changes to the chart do not impact any of the subsequent analysis or conclusions that follow.



Inset 1.1 Marine navigation study area

1.5 Proposed Development Site boundary

- 1.5.1 Following completion of this NRA, a minor amendment was made to the Site boundary for the Proposed Development. The updated Site boundary is shown in Inset 1.2.
- 1.5.2 However, all vessel traffic analyses and stakeholder consultation undertaken for this NRA were based on the previous Site boundary. A review of the amendment to the Site boundary has confirmed that it does not materially affect the conclusions of the NRA.
- 1.5.3 Accordingly, all figures within this report that include the Site boundary—particularly those presented in Section 4 and Section 5—depict the original Site boundary rather than the final amended Site boundary.



1.6.1 The structure of this report is described below:

- Section 2 provides an overview of the Proposed Development with outline design drawings for the proposed quay and adjacent berth;
- Section 3 describes the marine operations involved in each phase of the Proposed Development, together with anticipated vessel types by phase and quantum of vessel transits;
- Section 4 summarises the baseline navigation characterisation of the study area, including the management of navigation, the legislative framework, metocean conditions and key navigational features;
- Section 5 shows the vessel traffic analysis using Automatic Identification System (AIS) data obtained for the period 01 October 2024 to 30 September 2025 with commentary on vessel traffic by vessel type, together with swept path analyses of potential key interactions associated with the Proposed Development's marine operations;

- Section 6 provides a summary of the stakeholder engagement undertaken in the preparation of this NRA;
- Section 7 presents the NRA, including a summary of the methodological approach, identification of hazards, hazard scores and analysis; and,
- Section 8 summarises the findings of the NRA and provides conclusions and further recommendations.

2 Project overview

2.1.1 The marine infrastructure in the Proposed Development is made up of the following overarching elements, as authorised by **Work No.6** in Schedule 1 of the **draft Development Consent Order (Application Document Ref. 3.1)**:

- Work No. 6A – construction of permanent quay and associated wing walls including:
 - i. demolition of existing jetties and associated infrastructure;
 - ii. demolition and reinstatement of existing mooring infrastructure;
 - iii. relocation of existing navigational buoy; and
 - iv. extension of existing outfall;
- Work No. 6B – permanent quay; and
- Work No. 6C - capital dredging activities.

2.2 Proposed Development berth & quay design

2.2.1 On behalf of LGF Projects Ltd, Arup have prepared an outline design for the new dry bulk import berth and quay at the Proposed Development.

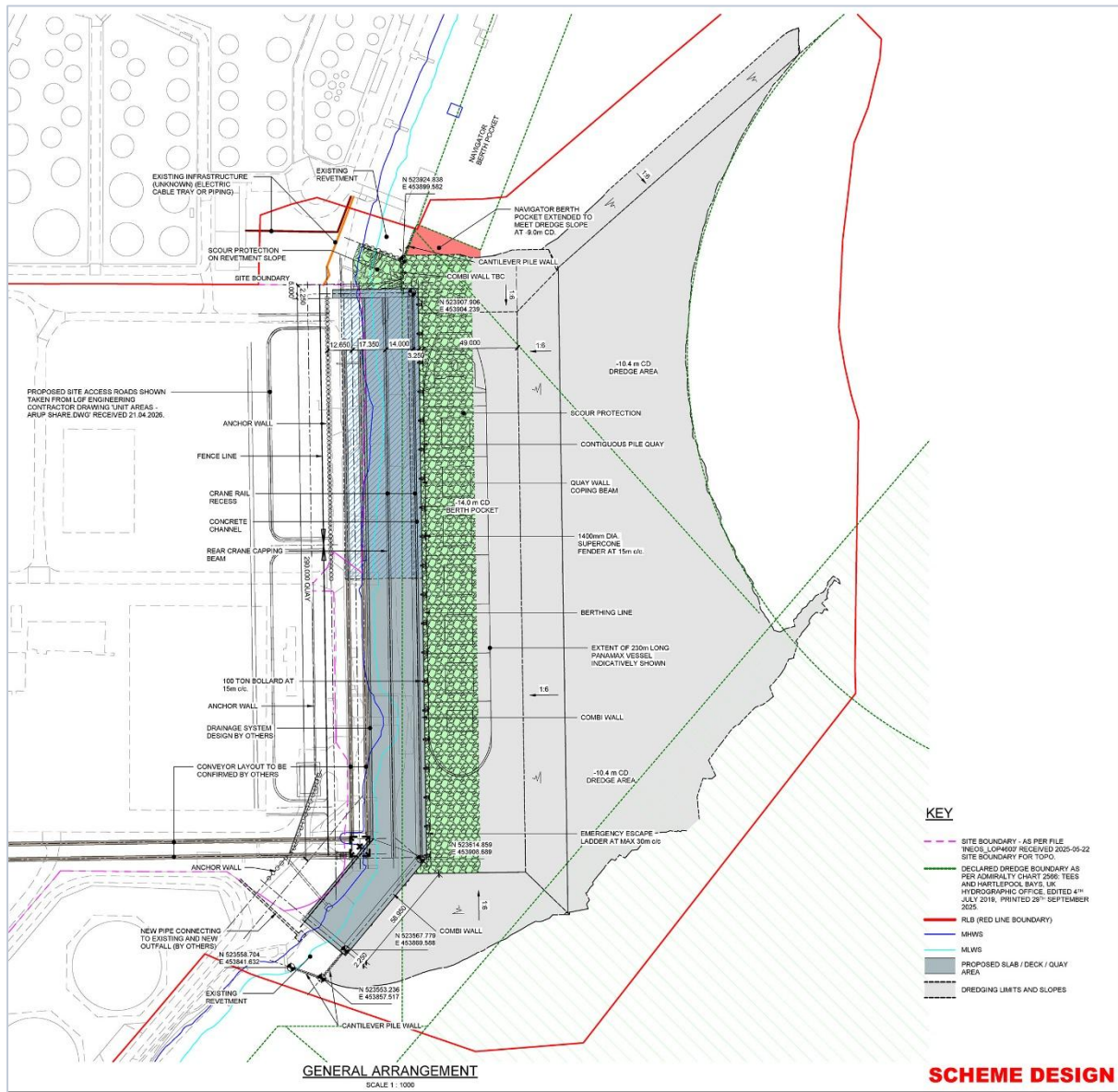
2.2.2 The quay development will be a combi wall, approximately 300m long. Siwertell Continuous Ship Unloader (CSU) cranes will be positioned on the quay, supported by mobile or rail- mounted grab cranes, to unload cargoes from vessels moored at the Proposed Development.

2.2.3 The Proposed Development berth will run parallel to the new quay. Its dimensions would be approximately 300m in length by 50m in width. See plan in Inset 2.1 and the outline design operational drawing in Inset 2.2.

2.2.4 The quay at the Proposed Development will be designed to accommodate a variety of vessels, the largest of which is likely to be a Panamax-style bulk carrier vessel, with typical dimensions of 230m Length Overall (LOA) x 32.2 m beam and with a deadweight tonnage (DWT) of between 65,000 and 85,000 tonnes.

2.3 Capital dredging

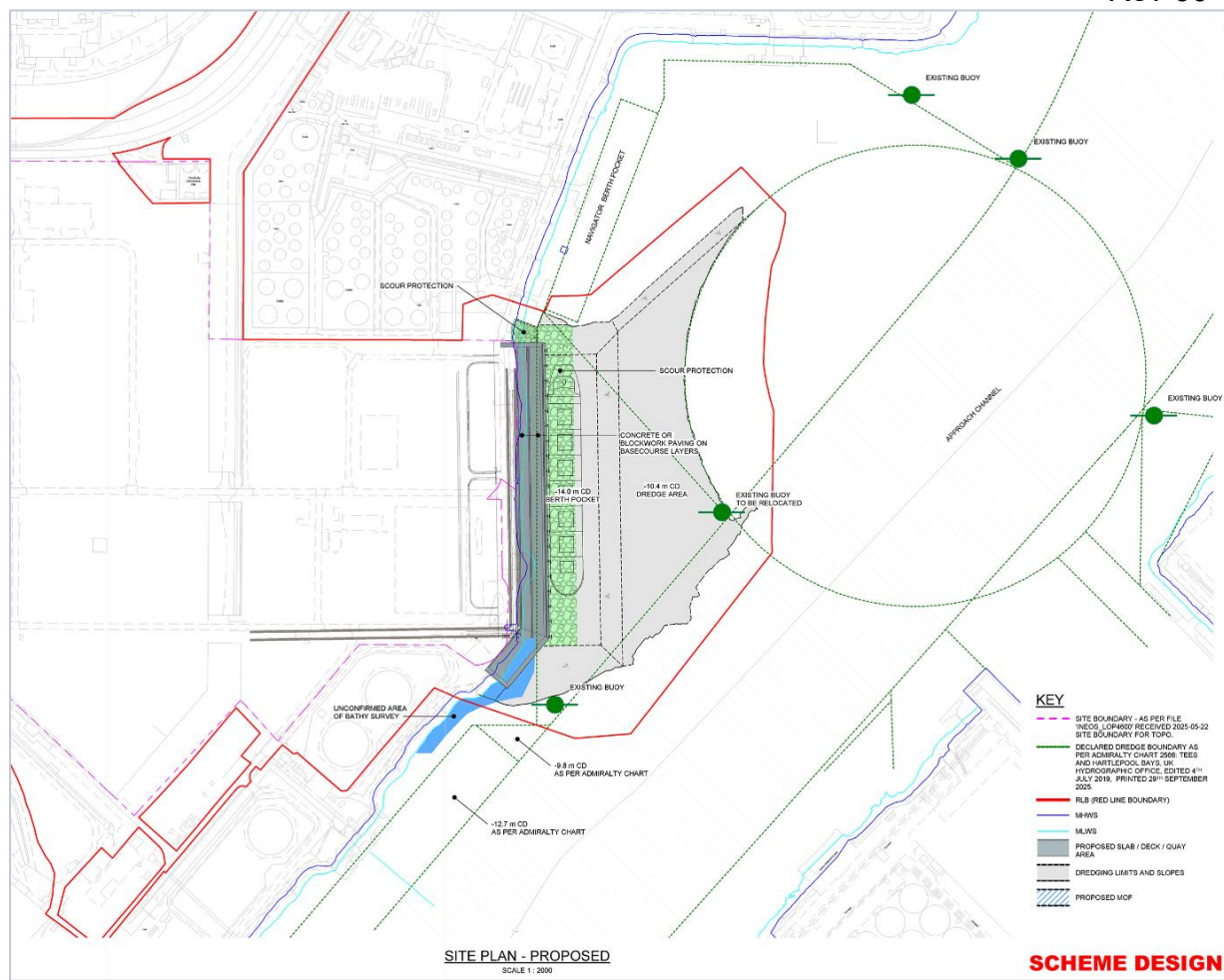
2.3.1 The Proposed Development berth pocket will be dredged to a maintained depth of -14m Chart Datum (CD). An approach channel between the existing turning circle (as shown in Inset 2.3) and the Proposed Development berth pocket would be dredged to a maintained depth of -10.4m CD. There would be side slopes between dredge areas at different depths.



Inset 2.1 Preliminary plan of Combi Wall (source: Arup)

Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA





Inset 2.3 Plan of berth and quay at the Proposed Development and proposed dredged depths (source: Arup)

Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA.

2.4 Offloading of construction materials

2.4.1 The Proposed Development plans to utilise a Modular Construction Approach where modular structures (Abnormal Indivisible Loads (AILs)) are prefabricated off site and transported via marine vessels to the new quay for offloading. Once offloaded, they will be transferred to the Proposed Development site via Self-propelled Module Transporters (SPMTs).

2.4.2 In addition to the modules there will be other AILs/Materials such as:

- Columns;
- Vessels;
- Pre-Assembled Racks (PAR);
- Process equipment/Skids;
- Containers/Palletised equipment; and
- Bulk aggregates.

2.4.3 An anticipated optimal modular size used by the project is (L x W x H) 40m x 20m x 35m, weighing up to 3,500 tonnes

3 Marine operations

3.1.1 This section describes the marine operations involved in each of the identified phases as summarised in Section 1.2.3:

3.2 Phase 1 marine operations

3.2.1 Phase 1 comprises three stages of marine activity: i) demolition of existing jetties and shoreside infrastructure; ii) capital dredging and iii) construction of the new quay at the Proposed Development. Further explanation is provided in this section.

Jetty demolition/shoreside infrastructure removal

3.2.2 The Proposed Development has a river side frontage currently occupied by two jetties. Prior to constructing a new quay wall, the existing No. 1 Jetty and No. 2 Jetty of the former INEOS site and other structures along the embankment would be demolished and any piles cut down or removed.

3.2.3 This operation is expected to rely on a combination of marine plant and landside plant. Marine plant is expected to include a Jack-up barge (JUB) with a crawler crane, supported by flat top barges (FTBs) and tugs to supply equipment and remove demolished materials.

3.2.4 Table 3.1 presents the assumed vessel spread and the number of anticipated transits during the demolition phase. The vessel activity assumptions have been developed to reflect a credible worst-case scenario from a navigation perspective and is based on the following assumptions:

- JUB with crawler crane is mobilised at the beginning of the demolition period and remains on site for the duration of the works and therefore only transits to and from the works area once.
- FTBs are used to transport material away from the site. Each FTB is assumed to have capacity for 500m³ of material. It is anticipated that there will be up to 16 no. FTB transits during demolition.
- multi-cat or tug is used to tow the FTBs to and from the Proposed Development and manoeuvre them around the work site. The number of transits is therefore the same as the barges.
- general workboat, dive support boat, or crew transfer boat is assumed to transit to and from the works area twice per day.
- the demolition programme of works is assumed to take three months to complete.

Table 3.1 Vessels and activity for demolition of existing infrastructure

Vessel Type	Approx. Dimensions (Length x Beam)	Approx. Draught	No. of anticipated transits*	Period of navigation activity
JUB with crawler crane	50m x 24m	3m	1	3 months
FTB	45m x 17m	3m	26	3 months
Multi-cat/Tug	23m x 8m	2.5m	26	3 months
General workboat/dive support/crew transfer boat	15m x 4m	1m	180	3 months

*Counts as a round trip (arrival and departure) as a single transit.

Dredging

- 3.2.5 Capital dredging is required in the river Tees to facilitate ships using the quay at all states of the tide. As described in Section 2.3, the proposal is to achieve a dredged pocket of a maintained depth of -14m CD in front of the quay approximately 300m long and 50m wide and a maintained depth of -10.4m CD on the approach channel (i.e. west of the turning circle). Once dredged, smaller vessels could navigate across this area at all states of the tide, however deeper draught vessels would need to wait for an appropriate tidal window.
- 3.2.6 The sequencing of dredging operations has yet to be determined. The dredging programme may be conducted in two phases depending on the requirements for delivery of construction materials and AILs for the plant. This may increase the number of transits of the dredger and multi-cat vessels slightly to allow for mobilisation and demobilisation for each phase.
- 3.2.7 In total, there is expected to be up to 800,000m³ of dredged material, which is secured by the Conditions in Part 2 of the deemed marine licence (Schedule 10 to the **draft DCO (Application Document Ref. 3.1))**.
- 3.2.8 The navigational impacts of maintenance dredging (i.e. cyclical dredging activity undertaken during operation of the Proposed Development) have not been assessed within the NRA as maintenance dredging is a routine operational activity undertaken within the Port with associated navigational risks managed by PD Teesport (PDT) in its role as Statutory Harbour Authority (SHA). As an established business-as-usual activity, maintenance dredging associated with the Proposed Development is not anticipated to materially alter the existing navigational risk profile of the Port, and any incremental navigational risk associated with such activities is therefore considered negligible relative to the baseline navigational risk environment.

3.2.9 Table 3.2 presents the assumed vessel spread and the number of anticipated transits during the dredging phase and is based on the following assumptions:

- Backhoe Dredgers (BHD) are envisaged to be the primary dredging equipment for the dredging works, paired with Self-Propelled Hopper Barges (SPHB) with an approximate capacity of 1,500m³ to transport the material to the disposal site;
- a multi-cat or tug is also mobilised for the duration to support operations;
- a general workboat or crew transfer boat is assumed to transit to and from the works area twice per day; and
- total period of navigation activity is 5 months and includes an allowance for mobilisation, demobilisation, and completion of slopes.

3.2.10 Final vessel types and number of transits will be confirmed by the dredging contractor in due course.

Table 3.2 Vessels and activity for dredging operations

Vessel type*	Approx. dimensions (Length x Beam)	Approx. draught	No. of anticipated transits**	Approx. period of navigation activity
Backhoe dredger (BHD)	60m x 18m	2m	1	5 months
Multi-cat/Tug	23m x 8m	2.5m	1	5 months
Self-propelled Hopper Barge	68m x 14m (1,517m ³ Volume)	4m	528	5 months
General workboat/crew transfer boat	15m x 4m	1m	300	5 months

* The choice of dredging method would be dependent on contractor equipment availability and appropriate investigation and testing of the sediment.

**Counts as a round trip (arrival and departure) as a single transit.

Construction of new quay

3.2.11 Table 3.3 presents the assumed vessel spread and the number of anticipated transits during the quay construction phase and is based on the following assumptions:

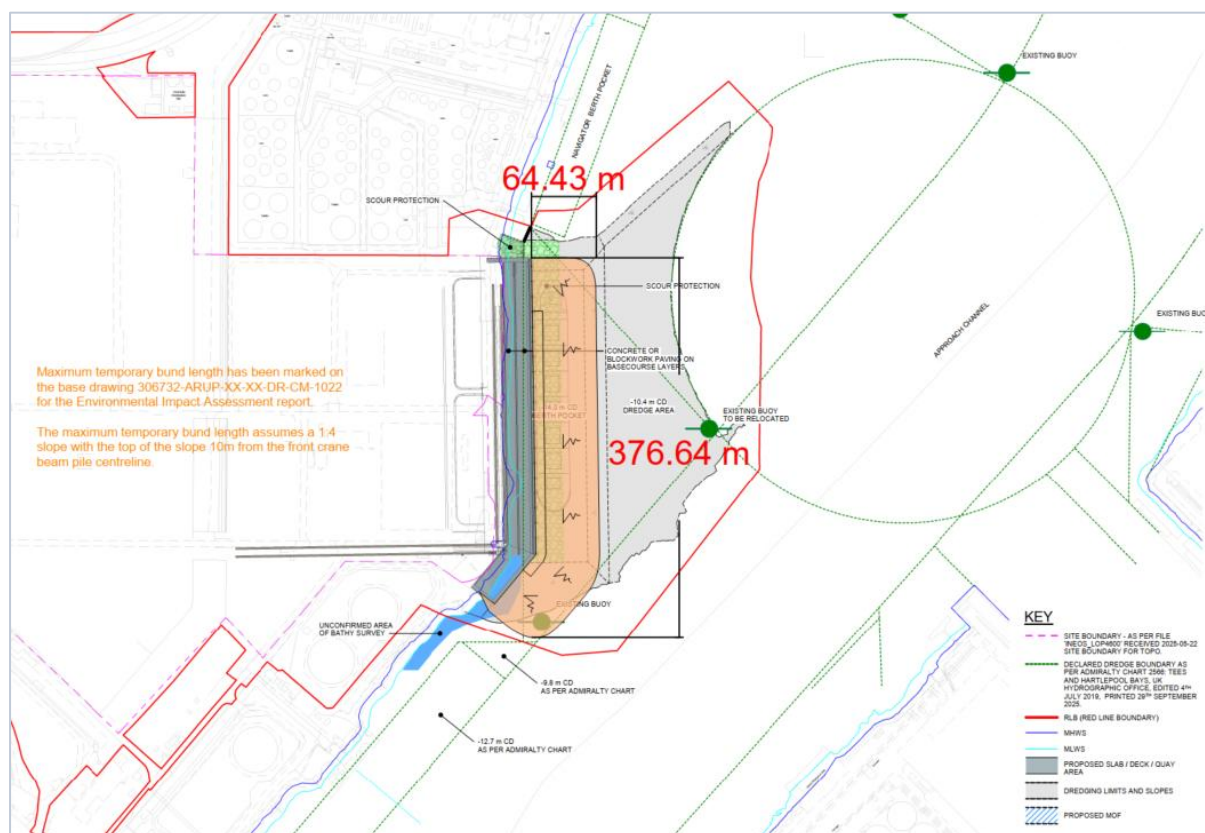
- two JUBs with crawler cranes are assumed to be mobilised in order to accelerate the piling campaign. They are assumed to arrive at the beginning of the works period and remain onsite for the duration. These vessels are therefore only expected to transit once each;

- FTBs are used to transport piles and other construction materials to the site. Each barge is estimated to have capacity to carry up to 14 tubular piles (stacked seven across the beam and two high). The construction is estimated to require approximately 390 such piles. In addition, there will be approximately 390 sheet double pan piles, assumed to be stacked at maximum 30 per barge load. An estimate of 41 no. FTB transits is therefore made. A multi-cat or tug is used to tow the FTBs to and from the work site and manoeuvre them around the work site. The number of transits is therefore the same as the barges;
- a dive support boat and general workboat is assumed to mobilise at the start and remain on site for the duration of the works;
- a general workboat or crew transfer boat is assumed to transit to and from the works area twice per day;
- the piling campaign is expected to drive the programme. Piling for the rear crane rail and anchor wall and pile testing would be carried out from land-based plant and these activities would not add to navigation activities in the river. From consultation with contractors, the marine piling programme is expected to last approximately 12 months;
- quay construction includes the importation of up to 150,000m³ granular fill immediately behind the quay wall. This material will be sand, gravel and cobbles. It is assumed to be delivered by SPHB with an approximate capacity of 1,500 m³; and
- an estimate of 528 transits are to be made by SPHB across a timescale of five months. These barges are considered to be commonly available and capable of dredging to suitable depths (>20 m, including tidal variation) in materials ranging from soft sediments to weak rock.

Potential Use of a temporary bund

- 3.2.12 There is an option to import an extra 230,000m³, of granular fill plus a protective surface mat to provide scour protection) as a temporary bund to support the quay wall construction.
- 3.2.13 The vessel movements listed in Table 3.3 cover both eventualities of either having the temporary bund or not having the temporary bund. If the bund option is progressed, then there will be more self-propelled hopper barge movements and if it is not then there will be two JUBs and more support vessels. Since the listed movements cover both options, they are a precautionary worst-case scenario.
- 3.2.14 The geographic extent of the bund would be slightly larger than the dimensions and proportions of the berth dredge pocket as shown in Inset

3.1. Construction of the bund is considered to have a negligible additional effect on navigational risk above that already assessed within the NRA should it be chose



Inset 3.1: Indicative plan showing optional Temporary Bund (Source: Arup)

Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA.

- 3.2.15 If the temporary bund is used, then only one JUB may be sufficient to construct the wing walls, with the quay wall constructed using land-based plant.
- 3.2.16 If the temporary bund is not used, there are likely to be two JUBs used to pile the quay wall and a spud barge to support the construction of the quay wall capping beam. This will be based on discussions with the construction contractors.
- 3.2.17 Final vessel types and number of transits will be confirmed by the contractor in due course.

Table 3.3 Vessels and activity for construction of the new berth

Vessel type	Approx. dimensions (Length x Beam)	Approx. draught	No. of anticipated transits (total)*	Period of navigation activity
JUB with crawler crane (x2)	50–70m x 18–32m	3m	2	12 months
Spud barge with crawler crane	50–70m x 18–32m	3m	1	12 months
FTB (x2)	45m x 17m	3m	41	12 months
Multi-cat/Tug (x1)	23m x 8m	2.5m	41	12 months
General workboat/crew transfer boat (x1)	15m x 4m	1m	240	12 months
Multi-cat/Tug	23m x 8m	2.5m	1	5 months
SPHB	68m x 14m; 1,517m ³ Volume	4m	304	5 months
General workboat/crew transfer boat	15m x 4m	1m	300	5 months

*Counts as a round trip (arrival and departure) as a single transit.

3.3 Phase 2 marine operations

- 3.3.1 During the construction phase of the rest of the Proposed Development, the quay and adjacent berth would be used as a Marine Offloading Facility (MOF) to facilitate the construction of the landside facilities. A variety of vessels would use the MOF during this phase of the Proposed Development. Table 3.4 presents the assumed vessel spread and the number of anticipated transits during the LGF plant construction phase and is based on the following assumptions:
- 3.3.2 Barges of various sizes are expected to supply construction materials. These materials would be lifted off by crane as a load on/load off (LoLo) operation. The crane could be on the quay or on the vessel, or both.
- 3.3.3 Should bulk aggregates be imported via marine vessel for site preparation during phase 2, then this is likely to be in a self-unloading vessel with ~7m draft. Exact vessel size is to be confirmed but deliveries are likely to comprise up to 40 arrivals during a 9 month period (or up to two vessels per week) with a 10,000 DWT Coaster used as a worst-case scenario. Mooring will be alongside the new quay.
- 3.3.4 AILs for construction of the SAF plant will arrive on heavy lift ocean going vessels or North Sea Barges. They are self-ballasting so that AILs can be unloaded to the quay directly over the side, or stern, of the vessel on self-

propelled modular transporter (SPMTs) as a roll on/roll off (RoRo) operation.

- 3.3.5 It is assumed there would be 200 consignments during this 18-month offloading/construction phase, off-loading up to 305 modules (as described in Section 2.3). The site operator will therefore seek opportunities to transport more than one item per vessel where this is practicable.
- 3.3.6 Side-on, alongside mooring is expected most of the time for the AIL deliveries. However, to provide flexibility during the construction operations, the NRA has assessed 10% of heavy lift vessel operations to involve vessels using a Mediterranean mooring configuration.
- 3.3.7 The exact vessel types are still to be determined. However, the MC Class vessel, *Biglift Baffin HLV* (see Inset 3.2) is considered the realistic worst-case scenario for AIL deliveries including those using Mediterranean mooring configurations. The MC-Class has a Length Overall (LOA) of 173 m and beam of 42 m. Additional vessel types to be used are detailed in Table 3.4.
- 3.3.8 Between two to four tugs will be required to support vessels arriving at, and departing from, the Proposed Development berth.
- 3.3.9 Final vessel types and number of transits will be confirmed in due course.



Inset 3.2 MC Class Biglift Baffin (Marine Traffic)

Table 3.4 Vessels related to MOF during Main Site construction phase

Vessel type	Approx. dimensions (Length x Beam)	Approx. draught	No. of anticipated transits*	Approx. period of navigation activity
MC-Class	173m x 42m	5.6m	Portion of 200 total transits (with 10% Med-Moored)	18 months
CY-Class vessel	152m x 40m	5.5m	Portion of 200 total transits	18 months
LO-LO vessel (example: RollDocks S Class)	142m x 24m	6.6m	Portion of 200 total transits	18 months
North Sea Barge	85m x 78.80m	3.4m Draught lightship ~ 0.94m	Portion of 200 total transits	18 months
10,000 DWT coaster**	130m x 20m	6.5	40	9 months (only used for bulk aggregate deliveries).
Tug (example: SVITZER)	30m x 10m	4.8m	2 to 4 per vessel arrival	As above

*Transits over the period of navigation activity. Counts as a round trip (arrival and departure) as a single transit.

**Aggregate for the construction of the Proposed Development may be delivered by vessel, the type and size of these vessels is yet to be determined so this has been included as a credible worst case scenario.

3.4 Phase 3 marine operations

- 3.4.1 This phase will comprise the delivery and offloading of the dry bulk imports at the Proposed Development. Dry bulk will include pelletised and non-pelletised feedstock for SAF production and for the Combined Heat and Power (CHP) plant which provides power and steam to the plant. The feedstock will be transported in a range of bulk carrier vessels from Coasters up to Panamax depending upon the feedstock origin and available quantities. Dry bulk imports to the berth are likely to be handled by handy-sized bulk carriers for UK sourced products and Panamax-sized bulk carriers for overseas-sourced products.
- 3.4.2 Table 3.5 presents the assumed vessel spread and the number of anticipated annual transits during the plant operation phase and is based on the following assumptions:
- berth utilisation is based on 365 days per year, 24 hours per day operations;
 - number of vessels' calls by vessel type and feedstock type are still to be confirmed. However, the credible worst case approach is an average of 28 vessel deliveries by a typical Panamax style vessel and 65 vessel deliveries by a typical Handymax style vessel per annum; and
 - the water depth in the approach channel will be the maintained dredged depth level of -10.4m CD plus height of the tide.
- 3.4.3 Final vessel types and number of transits will be confirmed by the operator and/or contractor in due course.

Table 3.5 Vessel related assumptions for dry bulk imports

Vessel Type	Approx. Dimensions (Length x Beam)	Approx. Draught	Annual No. of anticipated transits*
Panamax	230m x 32.31m	13m (max operation) likely to be 12.5m	28
Handymax	150 – 200m x 30 – 32m	10 – 12m	65

*Counts as a round trip (arrival and departure) as a single transit.

3.5 Summary of precautionary worst-case vessel types

- 3.5.1 Within this assessment, two vessel types are considered as the precautionary worst-case scenario, these being:
- an MC-class Heavy Lift Vessel (HLV) moored both alongside and stern-to the Proposed Development berth in phase 2; and

- Panamax bulk carrier for deliveries of feedstock during phase 3.

4 Baseline navigation characterisation

4.1 Introduction

- 4.1.1 Definition of the baseline navigational environment requires analysis of existing data to facilitate understanding of key navigational issues and impacts.
- 4.1.2 The proposed marine operations can then be mapped over the top of the baseline vessel traffic activity to understand the magnitude of any navigation impact they may pose.
- 4.1.3 Teesport is amongst the largest and busiest ports in the UK and has a diverse mix of vessel traffic activity. The port is primarily known for its bulk cargo operations and container handling, with major trades of oil, coal, grain, potash and soda ash exports.
- 4.1.4 Commercial vessels range from small port service crafts, up to large commercial tankers that can be draught restricted (i.e. they can only transit channels during high tide).
- 4.1.5 Relevant information regarding usage of Teesport has been collated to understand the baseline navigation environment within the study area.

4.2 Management of navigation

Statutory Harbour Authority

- 4.2.1 PDT operates as the designated Statutory Harbour Authority (SHA) for the Port of Tees and Hartlepool, collectively known as Teesport. Their primary responsibility entails the oversight of a 12 mile segment of the River Tees, extending three miles into the North Sea. The marine navigation study area is entirely contained within the SHA area.
- 4.2.2 PDT oversees all vessel traffic management, ensuring safe navigation and maintaining channel depths for the vessels that visit Teesport. Its powers are predominantly derived under the Tees and Hartlepool Port Authority Act 1966 [Ref 2], but it also exercises various other powers under other legislation applicable to all Harbour Authorities and byelaws as set out in Section 20.2 of **Chapter 20: Marine Navigation (ES Volume I, Application Document Ref. 6.1)**.
- 4.2.3 PDT is also the Competent Harbour Authority for the purposes of pilotage within its jurisdiction.
- 4.2.4 Additionally, PDT fulfils the role of the Local Lighthouse Authority, assuming the responsibility for the provision and proper maintenance of aids to navigation as necessary and effective management of any danger to

navigation from wrecks or obstructions, facilitating the safe passage of vessels.

Vessel Traffic Service

4.2.5 A Vessel Traffic Service (VTS) is operated in the approaches to, and within the SHA area of, Teesport. The purpose of a VTS is to contribute to safety of life at sea, improve the safety and efficiency of navigation and support the protection of the environment within a VTS area by mitigating the development of unsafe navigation situations through:

- providing timely and relevant information on factors that may influence ship movements and assist on-board decision making;
- monitoring and managing ship traffic to ensure the safety and efficiency of ship movements; and
- responding to developing unsafe situations.

4.2.6 PDT's General Directions for Teesport (see **Chapter 20: Marine Navigation, ES Volume I, Application Document Ref. 6.1**) define VTS controlled vessels as any vessel over 20m in length and requires them to seek permission from VTS before entry into the VTS area.

Pilotage requirements

4.2.7 PDT is the Competent Harbour Authority (CHA) for the marine navigation study area with respect to pilotage. The requirements for pilotage are contained within the PDT Pilotage Direction (October 2025) [Ref 3]. The areas where pilotage is mandatory in the Tees are:

- the Approach Channel from Tees North Buoy to the inner limit of the Seaton Turning Area;
- the navigable area of the Seaton Channel and Holding Basin;
- the navigable area of the Tees between the inner limit of the Seaton Turning Area and No.23 Buoy; and
- the navigable area of the Tees between No.23 Buoy and the upper limit of PD Teesport's jurisdiction.

4.2.8 The Pilotage Directions also state that pilotage is compulsory for vessels navigating in the above areas when:

- the LOA exceeds 95m; or
- the summer deadweight exceeds 4,000 tonnes; or
- the gross tonnage exceeds 4,000 tonnes; or

- the LOA exceeds 20m and the cargo(es) on board are dangerous goods or marine pollutants; or
 - the vessel is in excess of 50m LOA and requires the services of a tug; or
 - the vessel is less than 50m LOA and requires the services of a tug, where a risk assessment carried out by the Harbour Master and Tees Bay Pilots so dictates; or
 - two Pilots will be required for vessels with a "size indicator" in excess of 195,000 tonnes.
- 4.2.9 The vessels set out at 3.5.1.1 above to be the credible worst case options in phase 1 and 2 have a LOA exceeding 95m, and so on the basis of above, both will require pilotage to transit to and from the proposed berth at the former INEOS chemical terminal.

Baseline risk controls

- 4.2.10 Baseline risk controls are those that are currently embedded in the assessment of navigation risk within Teesport. These risk controls have been identified and developed by PDT and are documented in their HAZMAN II Port-wide Risk Assessment [Ref 4]. A full list of baseline risk controls is outlined in Table 4.1. The 'Control type' column provides a broad classification of each risk control measure.

Table 4.1 Teesport Baseline Risk Controls

ID	Risk control title	Control type
1	Admiralty Charts	Surveying and dredging
2	Conservancy - surveying and dredging	Surveying and dredging
3	Crane Maintenance Procedure	Education and training
4	Dry-Docks Operations procedures	Procedure
5	Duty Harbour Master 24/7	Procedure
6	Environment Agency (EA) flood alerts/tidal surge warnings	Procedure
7	Enforcement policy and suitable enforcement action when appropriate	Local Regulations
8	Event Planning	Education and training
9	Fixed life-saving appliances, Rescue Services and Search and Rescue (SAR) provision	Education and training
10	Information on local recreational events and races	Education and training
11	Licensing of tugs and Foyboatmen	Local Regulations

ID	Risk control title	Control type
12	Local Regulations – Act, Byelaws, General Directions (GDs)	Local Regulations
13	Management Standards (Standard Operating Procedures)	Procedure
14	National regulations and legislation	National Regulations
15	Navigational aids – appropriate and regularly checked	Nav aids
16	Notices to Mariners	Local Regulations
17	Passage Planning Information	Procedure
18	PDT Pilotage Plan	Pilotage
19	Pilot and Pilotage Exemption Certificate (PEC) training, examination and revalidation	Pilotage
20	Pilots and PECs	Pilotage
21	Port weather limits	Local Regulations
22	Portable Pilotage Units	Pilotage
23	Project cargoes individual passage plans and Risk Assessment	Procedure
24	Racing Rules	Education and training
25	Restricted visibility restrictions on movements	Local Regulations
26	Routine harbour patrols	Local Regulations
27	Routine stakeholder and public meetings	Procedure
28	Special movement risk assessments, planning and briefings	Procedure
29	Teesport Emergency Plans including COMAH	Procedure
30	Teesport Pollution control plans, equipment and procedures	Procedure
31	Tide gauges, meteorological monitoring and wave rider buoys	Nav aids
32	Towage guidelines	Local Regulations
33	Traffic control lights at Hartlepool	Local Regulations
34	Traffic control procedures for Teesport and Hartlepool	Procedure
35	Traffic Control Regulations October 2002	Procedure
36	Tug masters training and certification	Education and training
37	Tug operator ISM compliant or equivalent	National Regulations
38	Tug Operator Planned Maintenance	Procedure
39	Tugs available 24/7	Procedure
40	Under keel clearance requirements/regulations	Local Regulations

ID	Risk control title	Control type
41	Vessel manoeuvring weather limits	Local Regulations
42	VTs - Procedures, training and revalidation	VTs
43	VTs - Traffic/movement control	VTs

4.3 Legislation

- 4.3.1 The Tees and Hartlepool Harbour Byelaws [Ref 5] and General Directions for Safety of Navigation, Persons and Property in the Harbour [Ref 6] provide regulatory guidance as to how navigation should function within Teesport. Key clauses within the legislation that are of pertinence to this NRA are outlined in the remainder of this section.

The Tees and Hartlepool Harbour Byelaws (1966 and 1977)

- 4.3.2 Byelaw 29. Except with the express permission of the harbour master:

“the master of a vessel not under way shall cause his vessel to be securely moored or made fast in such a position as to be clear of the navigable channels.

the master of a vessel shall not cause his vessel to be made fast except to mooring points provided for the purpose or to another vessel properly moored or made fast.”

General Directions for Safety of Navigation, Persons and Property in the Harbour

- 4.3.3 General Directions which are pertinent to this Proposed Development are shown in Section 4.3.4 with their exact reference numbers shown in square brackets.

- 4.3.4 “[2.2] Permission For Vessels to Navigate:

[2.2.1] *Except with the prior permission of the Harbour Master, the Master of a VTS Controlled Vessel proposing to navigate in the Ports of Tees or Hartlepool, before entering the VTS Area, must obtain permission for the entry into the VTS Area from the Harbour Master when Passing Reporting Point Romeo. In giving such permission, the Harbour Master may specify a time different to that requested by the Master.*

[2.2.2] *Except with the prior permission of the Harbour Master, the Master of a VTS Controlled Vessel proposing to navigate (move or sail) in the CTS Area, before leaving the berth, must obtain permission for the movement from the Harbour Master.*

[2.2.3] *Permission given by the Harbour Master under General Direction [2.2.1] or [2.2.2] above will expire 15 minutes after the time for which it was given and, Where the VTS Controlled Vessel has not started to navigate before such time, the Master must obtain further permission from the Harbour Master prior to commencing navigation.*

[2.6] Overtaking

Except with the permission of the Harbour Master, overtaking manoeuvres for VTS Controlled Vessels are strictly prohibited within the Navigable Channels.

[2.7] Separation Distances

Except with the permission of the Harbour Master, the Master of a VTS Controlled Vessel must, as far as is reasonably practicable, maintain a separation distance of at least 2.5 cables (approximately 460m) from a VTS Controlled Vessel ahead, which is proceeding in the same direction.

[3.1] Notifying the Time of Arrival, Departure or Movement of Vessels:

[3.1.1.3] If intending to move within or sail from the Tees, give the Harbour Master at least 2 hours' notice of the intention to do so.

[3.2] Moorings

[3.2.1] The Master must at all times keep the Vessel properly berthed alongside any quay and must ensure that neither the vessel nor its moorings or gangway obstruct other vessel or hamper use of the Harbour.

[4.4] Marine Operations

[4.4.1] A Vessel engaged in loading, discharging or any other work where wash could create a risk to the operation, must ensure that a flag or rigid replica of the international Code of Signals Flags "RY" are displayed at all times.

[5.1] Restriction on Use of Recreational Vessels

No person may use any sailing boat, canoe, paddle boat or other recreation Vessel (whether or not such a vessel is powered) in the Harbour in a manner which may cause any danger, annoyance, nuisance or inconvenience to other Harbour users, or an injury to any person or damage to any property.

[6.11] Special Directions

[6.11.1] A Special Direction, pursuant to Article 5 of the Tees and Hartlepool Port Authority Revision Order 1974, may be given by the Harbour Master requiring any Vessel or Vessels in the Harbour to comply with a requirement made in or under a General Direction.

[6.11.2] A Special Direction may be given in any manner considered appropriate by the Harbour Master."

Marine and Coastal Access Act 2009

- 4.3.5 Any licensable activities required in connection with the Proposed Development which take place below Mean High Water Spring (MHWS) would fall under the Marine and Coastal Access Act 2009. As directed by the Act, licensing requirements are usually administered by the Marine Management Organisation (MMO). The Applicant is providing a deemed

marine licence for these licensable activities within the **draft DCO**
(Application Document Ref. 3.1).

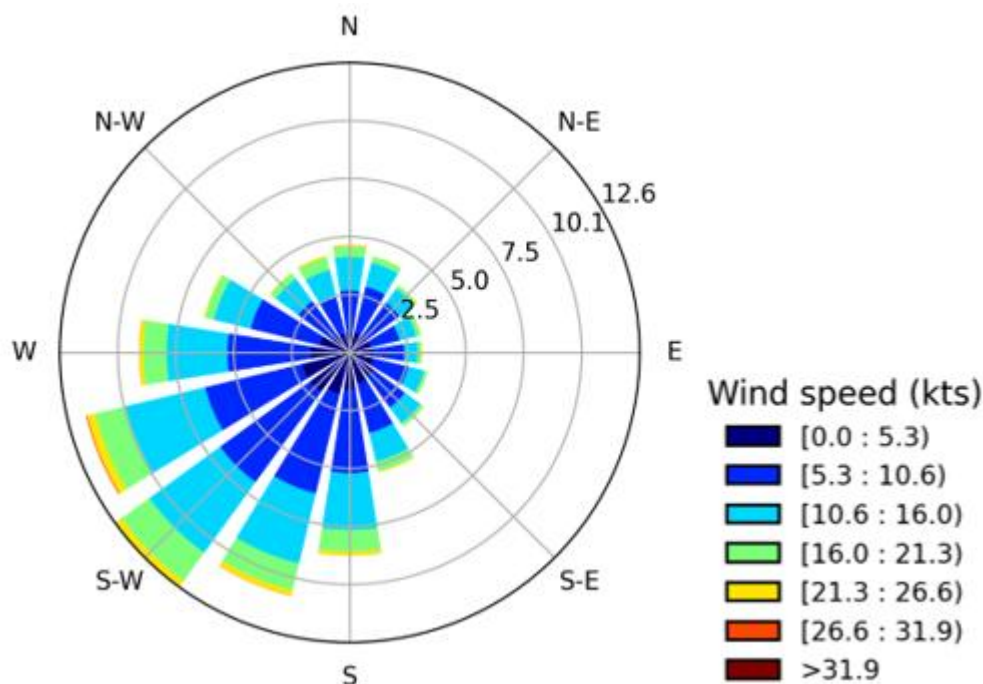
4.4 Metocean conditions

Tide

- 4.4.1 Tidal streams (sourced from Admiralty TotalTide software) are minimal within the marine navigation study area with Spring flow reaching approximately 0.5kts at mid-tide and neap flow reaching approximately 0.3kts at mid-tide.
- 4.4.2 The mean Spring range is 4.6m with the mean neap range being 2.3m, published mean tidal heights for 2026 are as follows:
- Mean High Water Spring 5.5m CD;
 - Mean Low Water Spring 0.9m CD;
 - Mean High Water Neap 4.3m CD; and
 - Mean Low Water Neap 2.0m CD.

Wind

- 4.4.3 Inset 4.1 shows a wind rose generated with Metocean information obtained from Copernicus Marine Data Store [Ref 7]. The location nearest to the Study Area was used (54° 33.6' N, 1° 11.4' E) approximately 3 NM southwest.
- 4.4.4 The wind rose shows that the prevailing wind is from the southwest with the wind blowing from the south, west, or southwest approximately 60% of the time. The maximum recorded wind speed was 32kts, however wind speed greater than 30kts occurred less than 1% of the time. Most commonly, wind speeds were less than 12kts.
- 4.4.5 The Study Area is located on the northeast side of the Tees. Therefore, vessels approaching the Proposed Development berth could expect to be blown off the berth (to the northeast) by relatively benign winds for many arrivals.

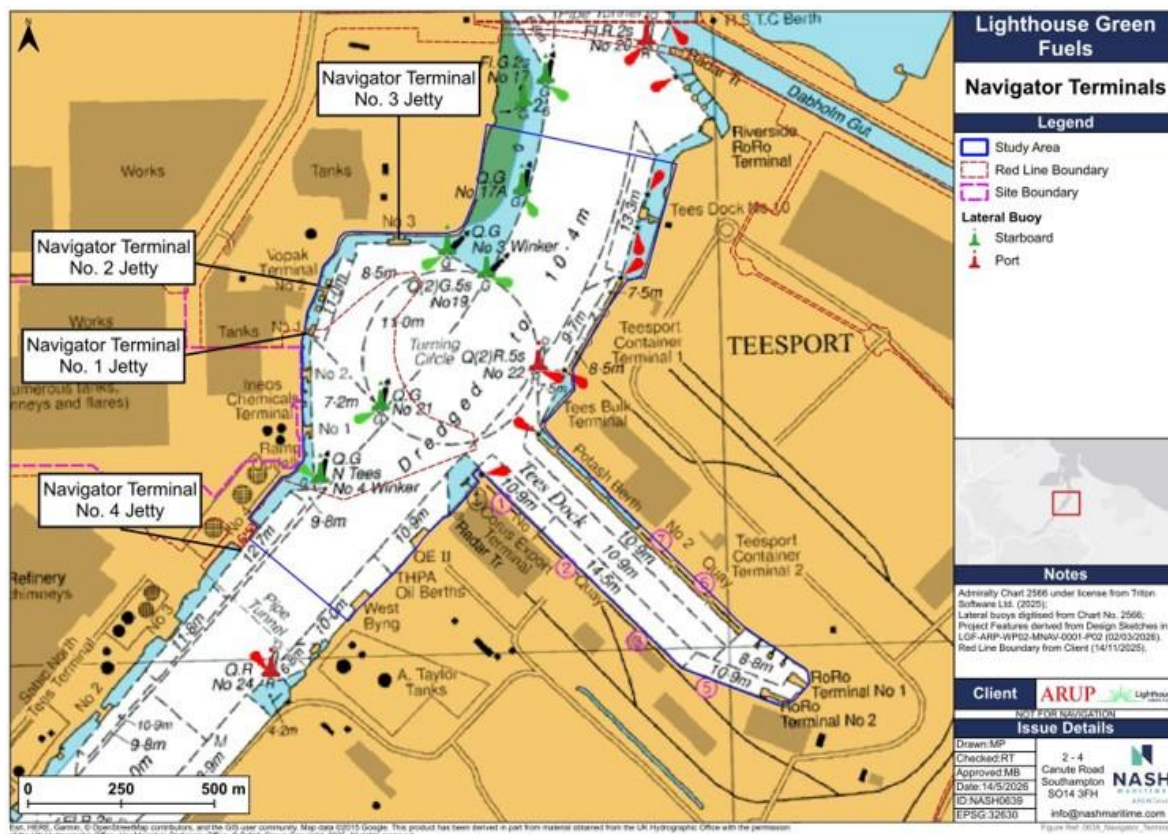


Inset 4.1 Wind Rose (Source: Copernicus Metocean Data)

4.5 Navigational features

Navigator Terminals

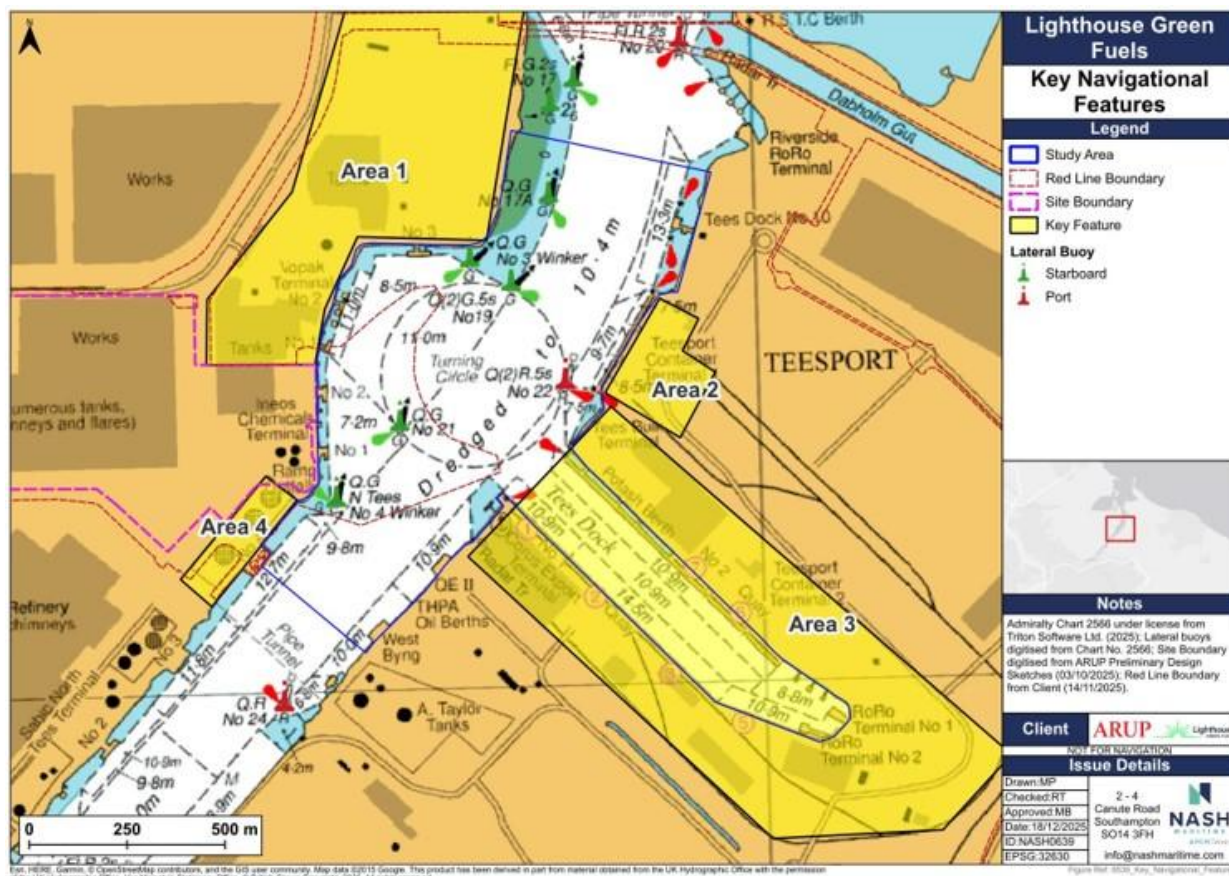
- 4.5.1 Navigator Terminals is an independent bulk liquid storage provider specialising in the supply of chemicals, fuels and biofuels. It has two separate terminals, one at Seal Sands and one at North Tees, both of which are located on the north side of the river Tees. There are three deep water jetties at Seal Sands, named No. 1, No. 2 and No. 3 - these lie to the north/northwest of the Proposed Development Site.
- 4.5.2 No.1 Jetty, which lies closest to the Proposed Development Site, is currently non-operational. No.2 and No.3 are operational and they receive frequent tanker deliveries (Note: Navigator jetties are marked as 'Vopak Terminal No.2' on the Admiralty Chart No. 2566 Ed.13). The jetties are shown in Inset 4.2.
- 4.5.3 No. 2 Jetty has a charted depth of 11.0m and No.3 Jetty has a charted depth of 8.5m. Whilst not shown on the Admiralty Chart, bathymetry data shows No.1 Jetty to have a depth of around 9.8m.
- 4.5.4 The North Tees Terminal lies to the southwest of the Proposed Development (highlighted as Area 4 in Inset 4.3). There are four jetties in total, one of which, No.4 Jetty (charted depth 12.7m), is operated by Navigator Terminals. No.4 Jetty is no longer situated within the Site boundary.



Inset 4.2 Location of Navigator Terminals

Teesport Container Terminal 1 (TCT1)

- 4.5.5 Teesport has two dedicated container terminals. TCT1 is a riverside facility on the south side of the river Tees consisting of two berths with a continuous quay of 294m. 'Tees Dock 9' berth has an alongside depth of 7.5m (Lowest Astronomical Tide (LAT)) and 'Tees Dock 8' has a depth of 8.5m (LAT). Each has a ship-to-shore gantry crane with a maximum lifting capacity of 40 tonnes.
- 4.5.6 TCT1 is located within Area 2 as shown in Inset 4.3.
- 4.5.7 Up until July 2025, P&O Ferries operated a Teesport–Zeebrugge service to the ro-ro terminal. This Teesport freight service has since been taken over by CLdN.



Inset 4.3 Key Navigational Features

Tees Dock

- 4.5.8 Tees Dock is the name given to the large dock located to the south of the navigation channel (highlighted as Area 3 in Inset 4.3). Tees Dock has several terminals including a Potash Berth, two Ro-Ro terminals and Teesport Bults Terminal.
- 4.5.9 Teesport Container Terminal 2 (TCT2) is also located within Tees Dock and consists of two berths with a continuous quay of 360m and an alongside depth of 10.9m (LAT). Three gantry cranes capable of handling Panamax size vessels provide a maximum lifting capacity of up to 45 tonnes. The terminal has rubber tyre gantry cranes, an integrated terminal operating system and extensive box storage areas.
- 4.5.10 Up until July 2025, P&O Ferries operated a Teesport–Zeebrugge service to the ro-ro terminal. This Teesport freight service has since been taken over by CLdN.

Navigation channel

- 4.5.11 The Approach Channel has a charted dredged depth of -10.4m LAT and is marked by AtoNs.

Tees Dock turning circle

- 4.5.12 Tees Dock turning circle is located to the east of the Proposed Development and to the north of Tees Dock entrance. It has a diameter of 470m and has a charted dredged depth of 11m LAT. Large vessels bound for the terminals and jetties within Tees Dock will typically turn at this point in the main river and go astern to the berth. The edges of the turning circle are marked by navigation buoy No.21 and North Tees No. 4 Winker buoy lying the closest to the Proposed Development.

5 Vessel Traffic Analysis

5.1 Introduction

- 5.1.1 To further an understanding of vessel movements within the marine navigation study area (see Inset 5.1), analysis of AIS data was undertaken.
- 5.1.2 AIS is an automatic tracking system fitted to vessels which broadcasts information about the vessel and its activities to other vessels and shore stations. AIS broadcasts include dynamic vessel information (location, speed, course) and static vessel information (name, size, type).
- 5.1.3 AIS is required on all commercial vessels over 300 gross tonnage, fishing vessels over 15m and may be carried by smaller craft such as smaller fishing boats and recreational craft.
- 5.1.4 The following section describes the vessel traffic analysis based on AIS data provided by Made Smart for the period 1 October 2024 to 30 September 2025.

5.2 Overview

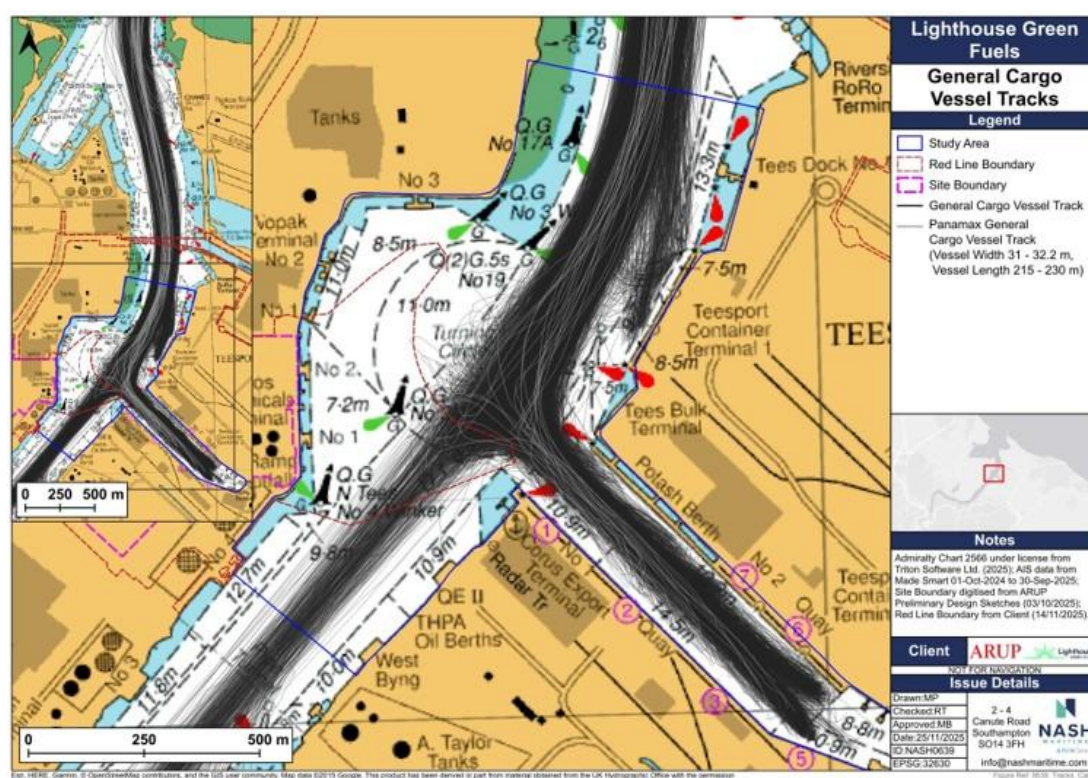
- 5.2.1 A total of 13,926 vessel transits were observed in the Study Area between October 2024 and September 2025. Up to 73% of the transits intersecting the Study Area were workboats, serving Teesport commercial vessel terminals as well as terminals outside the Study Area, such as Able Seaton Port and Norsesea Oil Terminal.
- 5.2.2 Cargo vessels were the next most frequent vessel type, with 2,892 transits (21%) recorded. Tanker vessels made 921 transits (7%) and include the largest vessels by LOA (>250m) to enter the Study Area. Very few fishing or recreational vessels were recorded in the Study Area, although these may be underrepresented due to smaller vessels not being required to carry an AIS receiver.
- 5.2.3 The busiest port area was Area 3 (Tees Dock) with 28% of transits (3,847) within the Study Area – see Table 5.1. In addition, there was a higher proportion of transits made by cargo and tanker vessels at the northern perimeter of the Study Area, downriver of the dredged turning circle, compared to the southern perimeter. Tidal analysis (see Section 5.10) demonstrated that vessels subject to compulsory pilotage were not significantly constrained by tide.
- 5.2.4 Table 5.1 shows the number of transits in the study area by vessel type and the key areas they utilised. The vessel types adopted within this NRA are summarised in Table 7.5.

Table 5.1 Total vessel transits by type in the Study Area and at each dock area during the one-year period

Vessel type	Study Area	Area 1 - Navigator Terminals			Area 2 – Container Teesport Terminal	Area 3 – Tees Dock	Area 4 – Navigator Terminal 4
		1	2	3			
Fishing	6	-	-	-	-	-	-
General Cargo	2,892	-	-	-	339	2,188	-
Recreational	8	-	-	-	-	-	-
Tanker	921	-	279	250	-	14	126
Workboats	10,099	54	348	264	617	1,645	306
Total	13,926	54	627	514	956	3,847	432

5.3 Cargo vessels

5.3.1 General Cargo vessel tracks are presented in Inset 5.1.



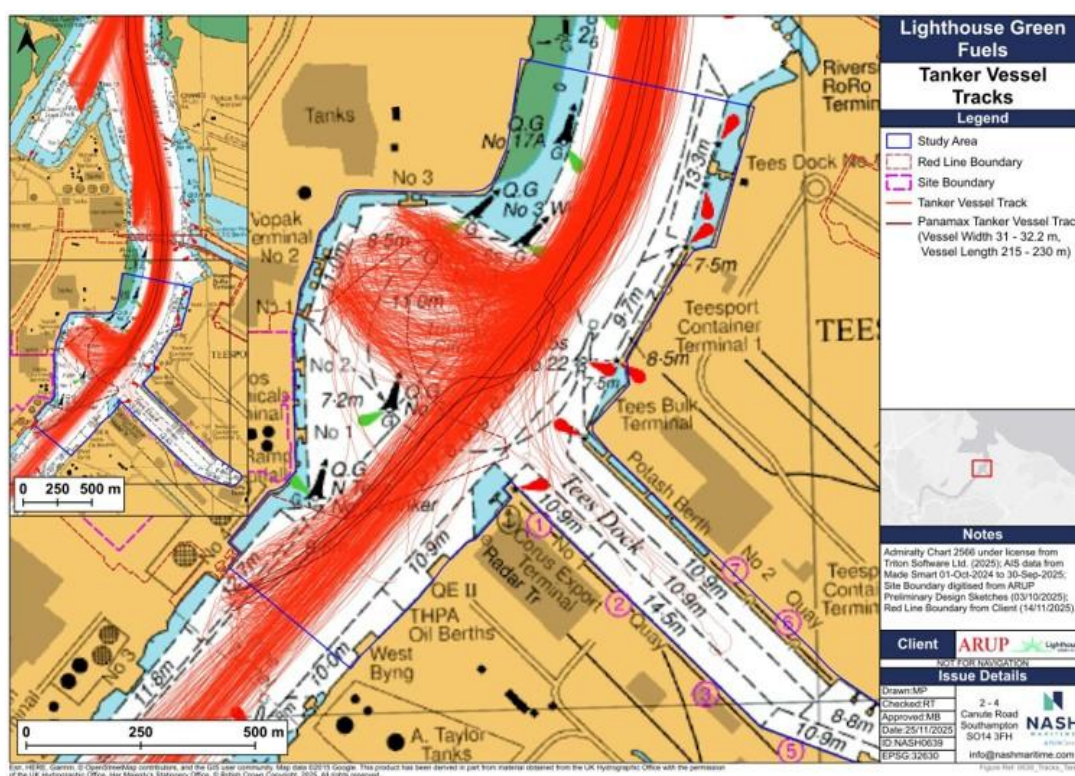
Inset 5.1 Cargo vessel tracks

5.3.2 A total of 2,892 general cargo vessel tracks were observed within the Study Area. The most frequently utilised area was Area 3, with 2,188 transits (76% of general cargo traffic). Approximately 356 transits (12%) passed directly through the Study Area remaining within the dredged channel, while 339 transits (12%) utilised the Teesport Container Terminal in Area 2.

- 5.3.3 Approximately 79% (2,286 transits) of the general cargo vessel transits that intersected the Study Area were made by vessels >100m LOA. General cargo vessels >200m LOA primarily utilised Tees Dock or continued transiting upriver within the channel.
- 5.3.4 A subcategory of Panamax vessels was defined by vessel width (31m to 32.2m) and LOA (215m to 230m). Of the general cargo vessel transits within the Study Area, 22 were identified to be from Panamax-sized vessels. Each of these utilised Tees Dock and the majority terminated at the 14.5m dredged depth berth on the Number 1 Quay.

5.4 Tanker vessels

- 5.4.1 Tanker vessel tracks are presented in Inset 5.2.



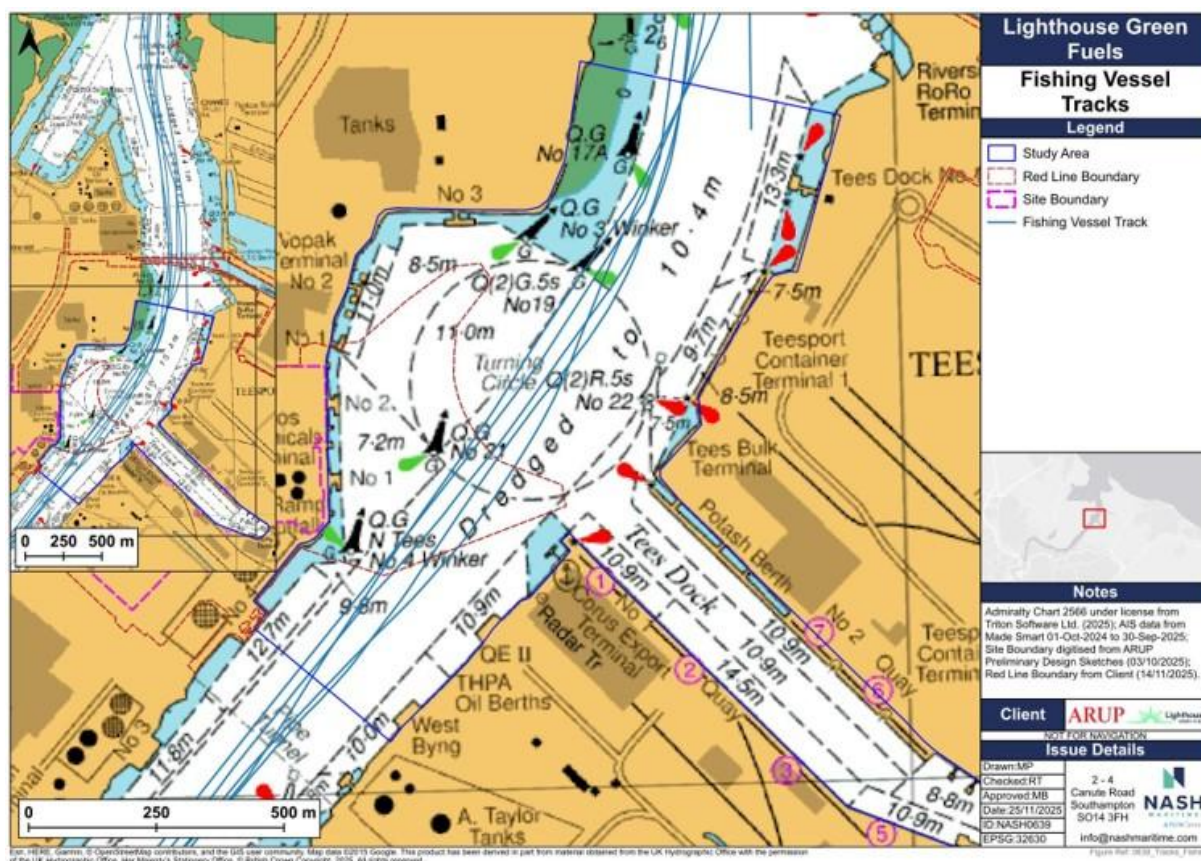
Inset 5.2 Tanker vessel tracks

- 5.4.2 A total of 921 tanker vessel tracks were observed within the Study Area. Of these, 529 transits (57%) were made to Area 1 while 245 transits (27%) passed directly through the Study Area. Navigator Terminal No. 4 Jetty in Area 4 was utilised less frequently with approximately 126 tanker vessel transits recorded (14%), and only 14 transits were recorded at Area 3.
- 5.4.3 Over 62% (575 transits) of tanker vessel transits within the Study Area were made by vessels >100m LOA, and overall less than 3% (25 transits) were >200m LOA. These largest tanker vessels utilised the Navigator Terminal No.4 Jetty exclusively.

- 5.4.4 Utilising the same features as with general cargo vessels, a subcategory of Panamax vessels was defined for tanker vessels. Of the tanker vessel transits within the Study Area, four were identified to be from Panamax-sized vessels. All four of these transits terminated at the Navigator No.4 Jetty which lies to the southwest of the Proposed Development site.

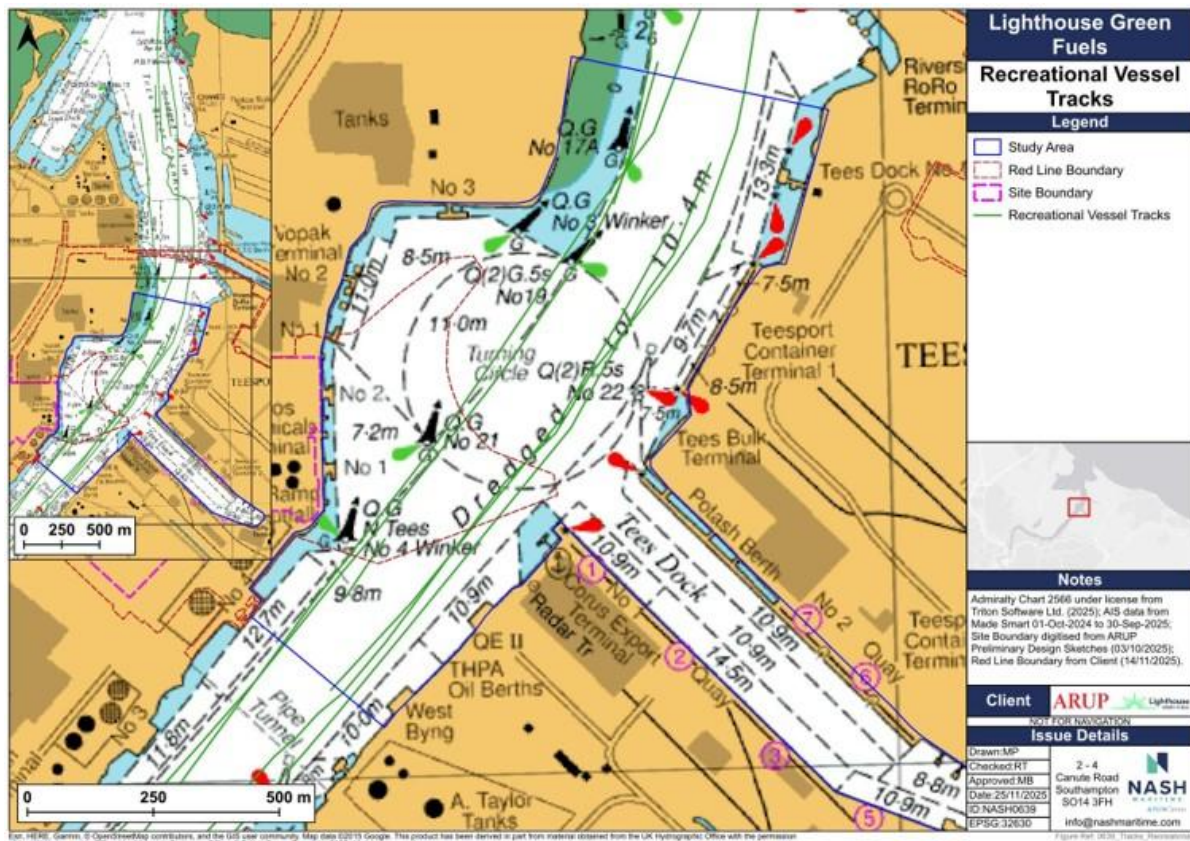
5.5 Fishing vessels

- 5.5.1 Fishing vessel tracks are presented in Inset 5.3



Inset 5.3 Fishing vessel tracks

- 5.5.2 A total of six fishing vessel transits were recorded passing through the Study Area. These were made by three unique vessels of 13m, 24m and 34m LOA and up to 6m in draught. There was no active fishing recorded by AIS data within the Study Area.
- 5.5.3 It must be noted that AIS is not mandatory for vessels of less than 15m length and therefore fishing activities of vessels with a LOA less than 15m may be underrepresented through the AIS data.
- ## 5.6 Recreational vessels
- 5.6.1 Recreational vessel tracks are presented in Inset 5.4.



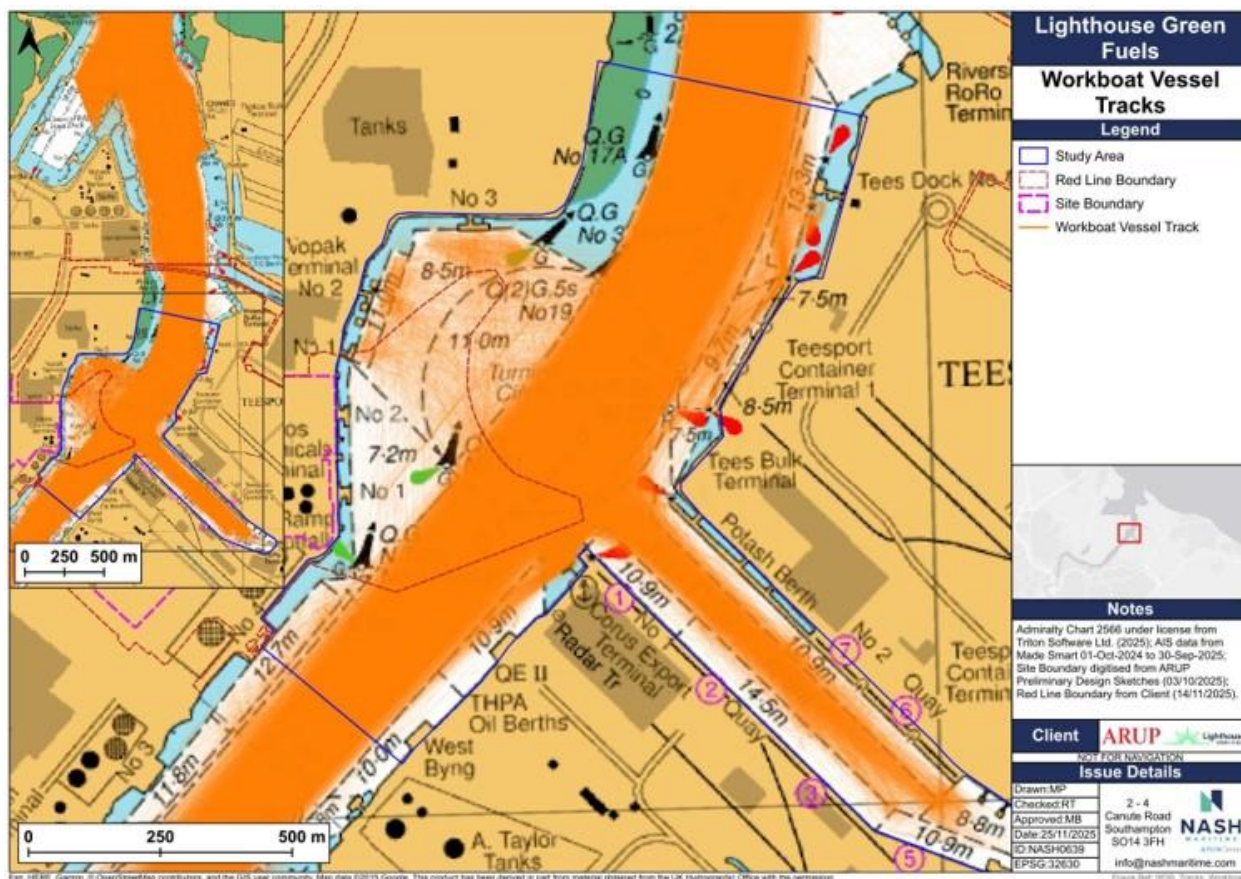
Inset 5.4 Recreational vessel tracks

5.6.2 There were a total of eight recreational vessel transits recorded on AIS transiting through the Study Area. The transits were made by four unique vessels, all less than 12m in LOA. Generally, recreational vessels utilise the edges of the main channel.

5.6.3 Smaller vessels, including unpowered and some powered recreational craft, are not obliged to carry AIS and therefore could be underrepresented in AIS vessel traffic analysis.

5.7 Workboats

5.7.1 Workboat vessel tracks (including tugs, service vessels and other port craft) are presented in Inset 5.5.



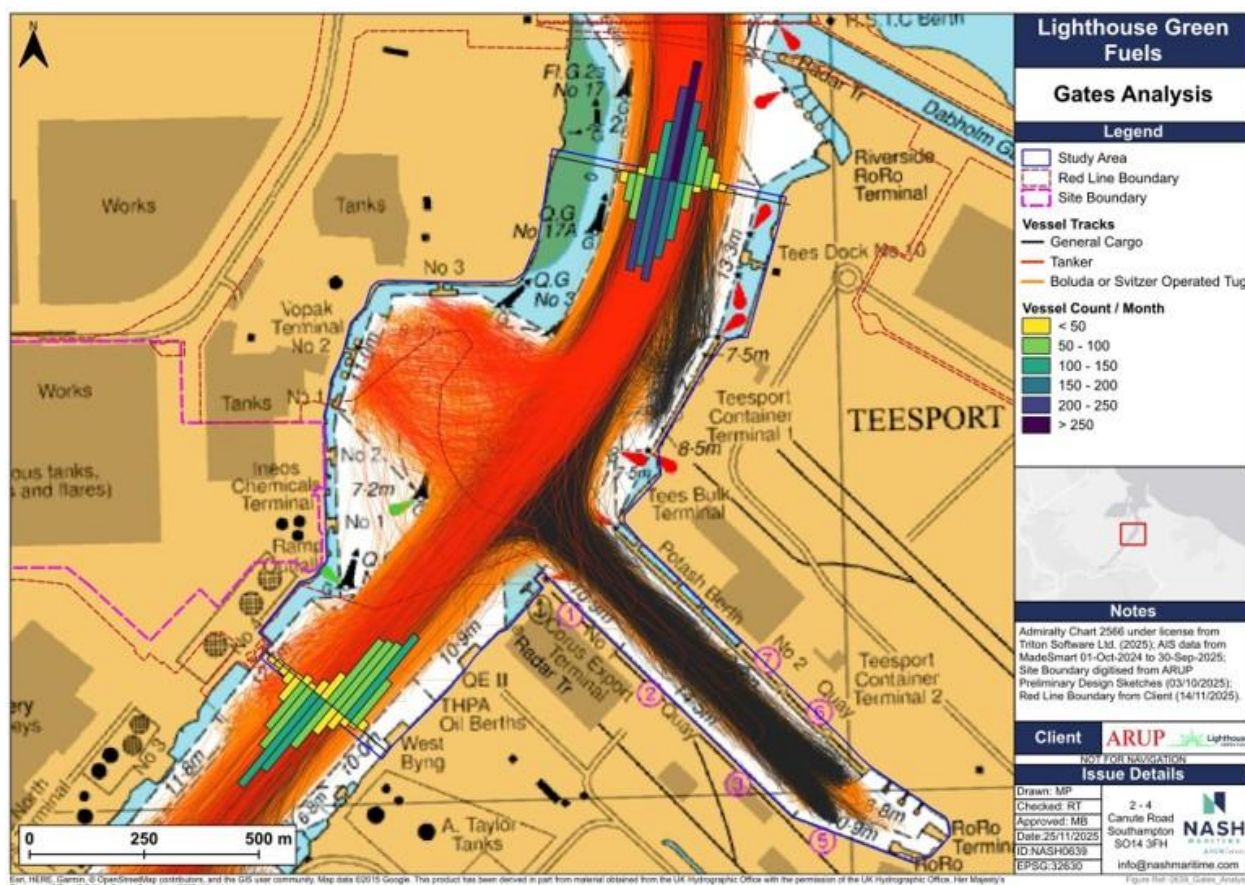
Inset 5.5 Workboat vessel tracks

- 5.7.2 Workboats made 10,099 transits within the Study Area, of which 3,752 transits (37% of workboat transits) were located at the Teesport Bults Terminal in Area 3.
- 5.7.3 Workboats were recorded at every key location. Tugs operated by Svitzer and Boluda were primarily recorded transiting in the main channel, and at terminals in Areas 1 and 3. Additionally, some transits made by Svitzer-operated tugs were recorded at the Teesport Container Terminal in Area 2, and the Navigator Terminal No.4 Jetty in Area 4.

5.8 Gate analysis

- 5.8.1 To develop an understanding of the lateral distribution of transits entering and exiting the Study Area, gate analysis was undertaken. The analysis was conducted on transits made by cargo vessels, tanker vessels, passenger vessels, and Svitzer or Boluda-operated workboats. This analysis also presents the number of outbound and inbound vessel movements by vessel type across each gate.
- 5.8.2 The location of two gates located at the northern and southern bounds of the Study Area are presented in Inset 5.6, and vessel movement numbers intersecting each gate are summarised in Table 5.2.

- 5.8.3 The gates show that traffic at the north of the Study Area transits at a higher frequency than the south of the Study Area. In both areas, the transits are most often within the dredged channel, with a slight directional effect of inbound and outbound vessels navigating on either side of the channel and the highest intensity of transits towards the centre of the channel.
- 5.8.4 The vessel counts recorded at each gate are consistent with expectations that the greatest number of transits are downriver from the turning circle, compared to a decreasing number of transits upriver. At the southern gate, there were fewer transits of all vessel types. This reflects that the majority of cargo and tanker vessels transiting through the northern gate enter berths within the Study Area from downriver and subsequently depart heading downriver. At the northern gate, the number of cargo vessel transits is more than double the number of tanker vessel transits, however both vessel types are recorded at closer frequencies through the southern gate.



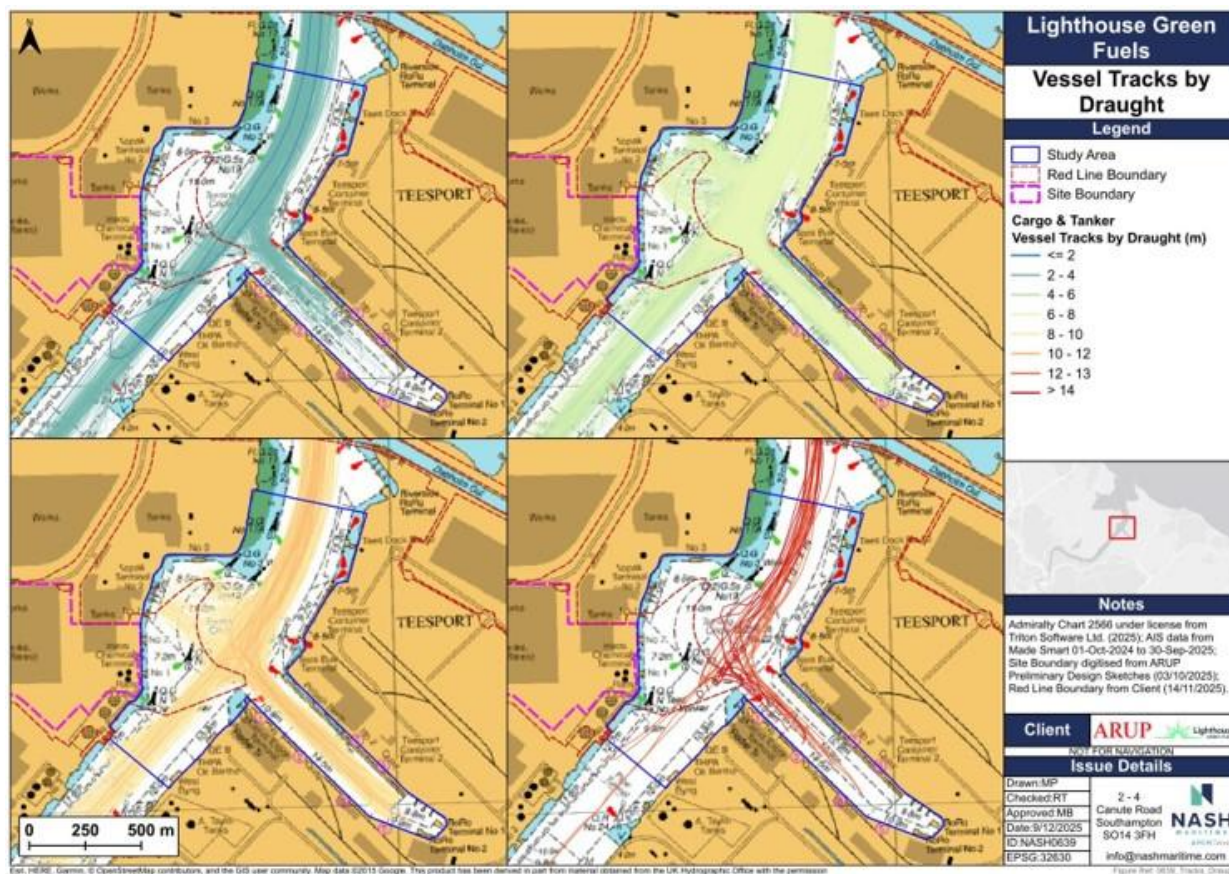
Inset 5.6 Gate analysis

Table 5.2 Gate transit counts by type

Gate	Direction	General Cargo	Tanker	Svitzer/Boluda Workboat
North Gate	Northbound Transits	525	213	445
	Southbound Transits	537	214	448
South Gate	Northbound Transits	84	84	394
	Southbound Transits	84	103	381

5.9 Vessel tracks by draught

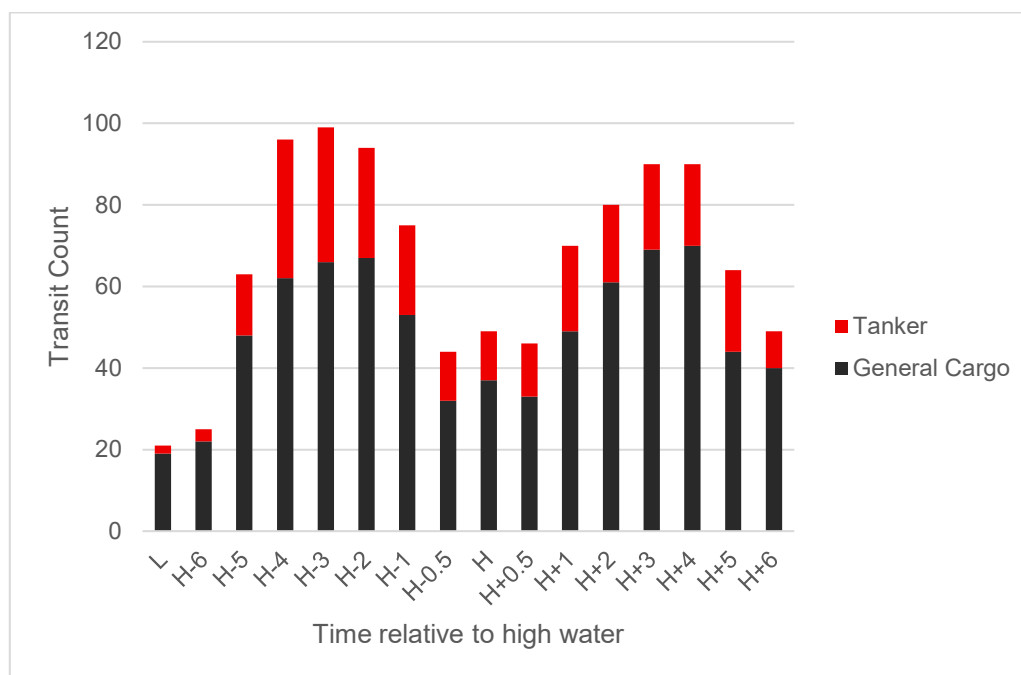
- 5.9.1 To understand how vessels of different draughts transit within the Study Area, analysis was undertaken on general cargo and tanker vessels (presented in Inset 5.7). It must be noted that vessel draughts were determined based on the available vessel characteristics and are therefore not adjusted to the vessel's load on specific transits.
- 5.9.2 The majority of transits were made by vessels with 4m to 10m draught, and 40% of transits were made by vessels with 6m to 8m draught. Overall, the proportion of transits made by cargo vessels at each draught was similar to the proportion of each draught in tanker vessels.
- 5.9.3 Area 3 and the Dredged Channel were the only areas utilised by vessels of every draught. In addition to the aforementioned areas, the deep-draught (> 12m) vessels (0.7% of transits) made two transits at Area 4. Vessels with draughts from 8m to 12m (26% of transits) visited the same areas more frequently, as well as Area 1. Vessels with draught 4m to 8m (66% of transits) utilised Area 4 less than vessels 8m to 12m, and were the only vessels to transit at Area 2. Transits made by vessels with shallower draughts (< 4m) were spatially similar to those made by deep-draught vessels, however with no utilisation of Area 4 and a much greater volume of transits (7.3% of transits).



Inset 5.7 Vessel tracks by draught

5.10 Tidal analysis

- 5.10.1 To provide insight into the port usage by large commercial vessels over the tidal cycle, the one-year AIS dataset was utilised to calculate the number of transits made by general cargo and tanker vessels at $\geq 95\text{m}$ LOA at the northern gate. Approximate times relative to the tidal hour were added, and the resulting counts are presented in Inset 5.8 and Table 5.3.
- 5.10.2 From the 1,055 transits included, there was not a significant tidal constraint. In addition, the proportions of general cargo vessel transits were similar to the proportions of tanker vessel transits within an hour before and after high water.
- 5.10.3 As described in Section 3, this NRA is considering a credible worst case that up to 28 Panamax deliveries and up to 65 Handymax deliveries will be made to the Proposed Development over 12 months during phase 3 (roughly 1 – 2 deliveries per week, averaging closer to 2). Panamax vessels are likely to transit within a window of an hour before and an hour after high water so, based on the tidal analysis between October 2024 and September 2025, this additional number of transits is unlikely to have a material impact on port operations.



Inset 5.8 Tidal analysis

Table 5.3 Summary of tidal analysis

	L	H-6	H-5	H-4	H-3	H-2	H-1	H-0.5	H	H+0.5	H+1	H+2	H+3	H+4	H+5	H+6
General Cargo	19	22	48	62	66	67	53	32	37	33	49	61	69	70	44	40
Tanker	2	3	15	34	33	27	22	12	12	13	21	19	21	20	20	9
Total	21	25	63	96	99	94	75	44	49	46	70	80	90	90	64	49

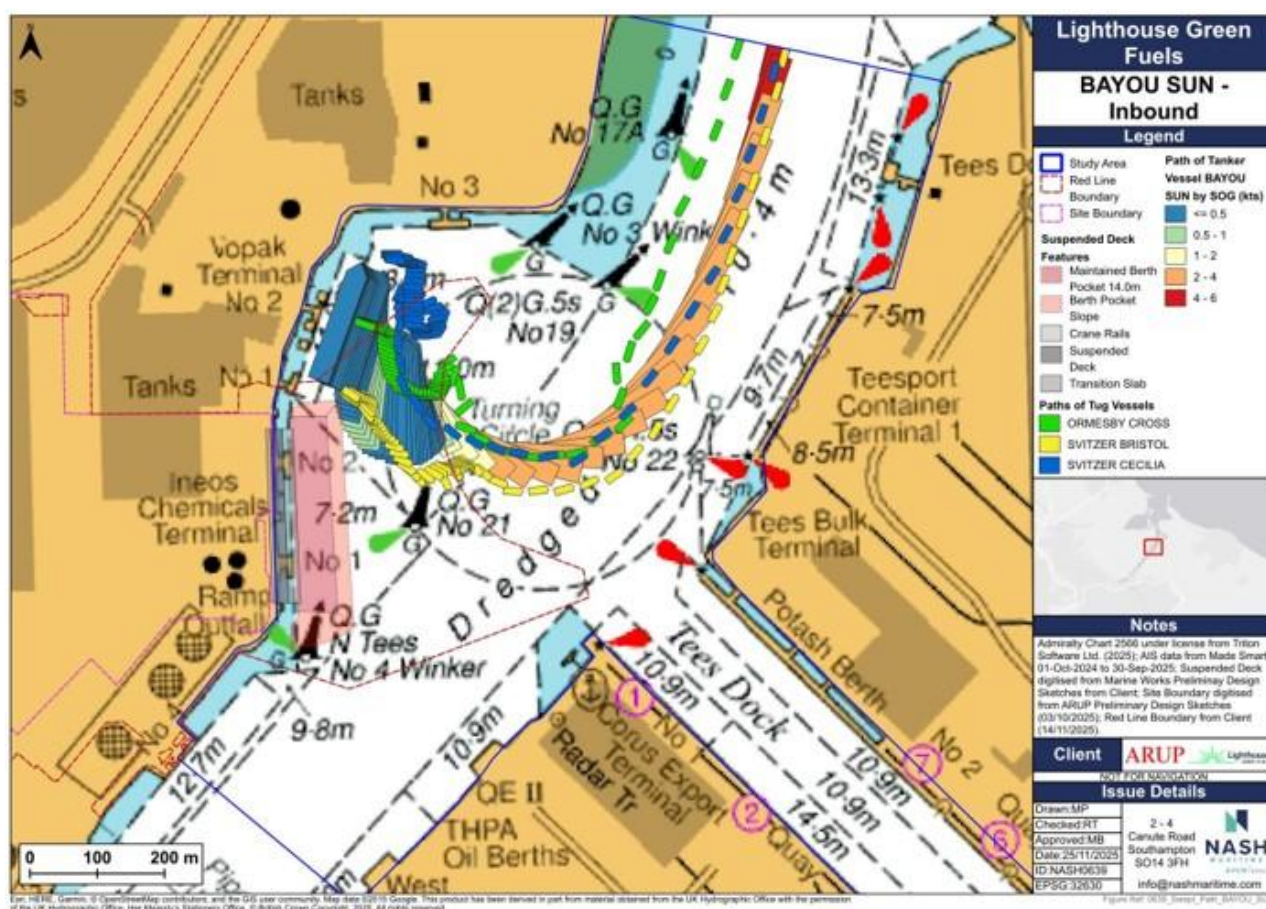
5.11 Swept path analysis

- 5.11.1 Analysis of available AIS data was undertaken to characterise the typical approach and departure of large vessels at specific berths. These were used to understand vessel manoeuvres, tug operations and assess clearance distances.

Arrivals at Navigator No. 2 Jetty

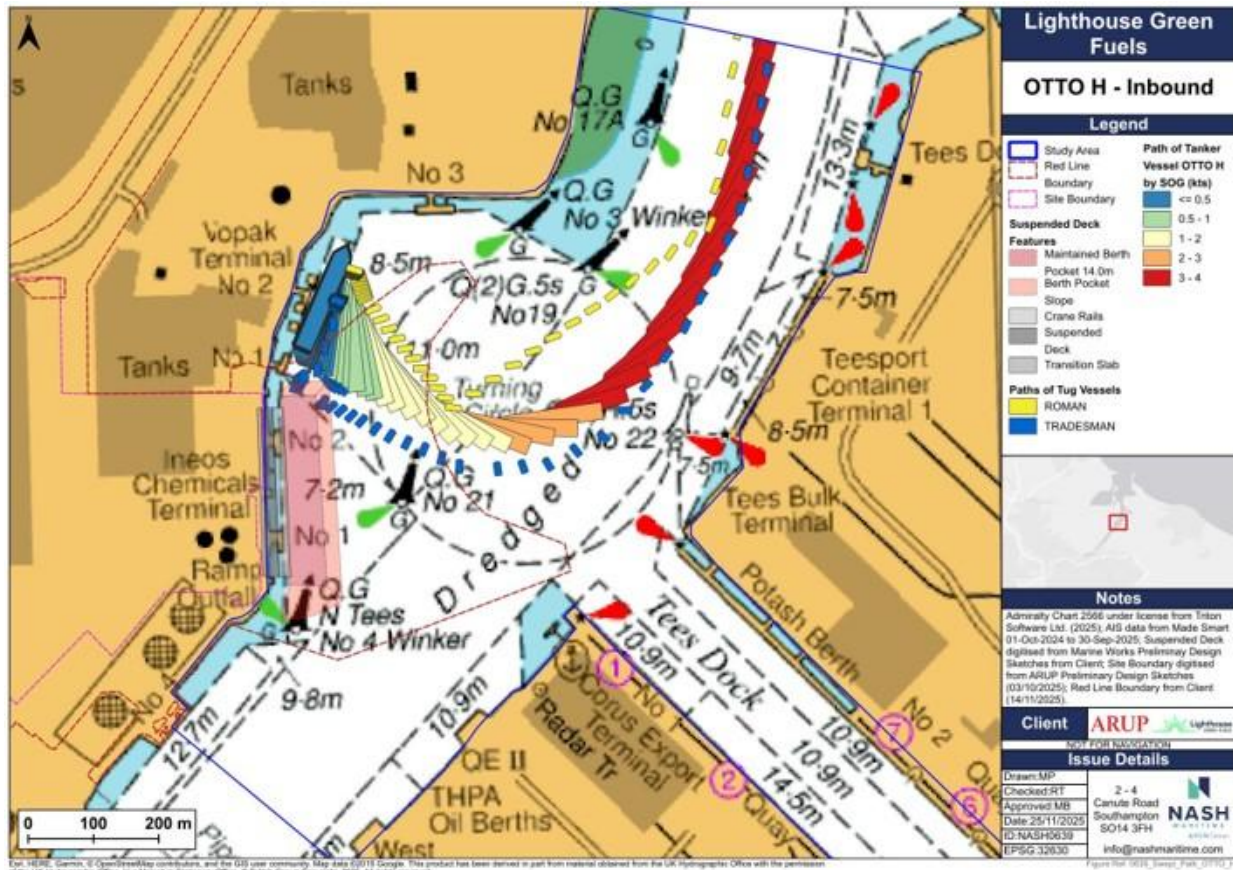
- 5.11.2 As reported in 4.5.1, there are three jetties operated by Navigator Terminals situated to the north/north east of the Proposed Development. From 01 October 2024 to 30 September 2025 the largest tanker alongside Navigator Terminals No.2 Jetty was 186m LOA *Bayou Sun*. As can be seen in Inset 5.9, when mooring, this vessel came close to the dredged pocket area of the Proposed Development. On a separate occasion, during the inbound arrival of a smaller tanker, the 167m LOA *Otto H*, tugs assisting the vessel had some overlap with the dredged pocket area of the Proposed Development – see Inset 5.10.

5.11.3 Whilst Navigator Terminal No.1 Jetty is located closer to the Proposed Development berth than Navigation Terminals No.2 Jetty, it was not included within the detailed assessment presented in the NRA as it was inactive at the time of the baseline surveys and no vessel movements associated with the berth were recorded. Furthermore, insufficient information was available regarding the nature, timing and intensity of any future operations at the jetty. The assessment therefore focused on Navigator Terminals No.2 Jetty, which was operational throughout the survey period and represented the closest active berth to the Proposed Development.



Inset 5.9 Inbound arrival of tanker vessel Bayou Sun in relation to the Proposed Development

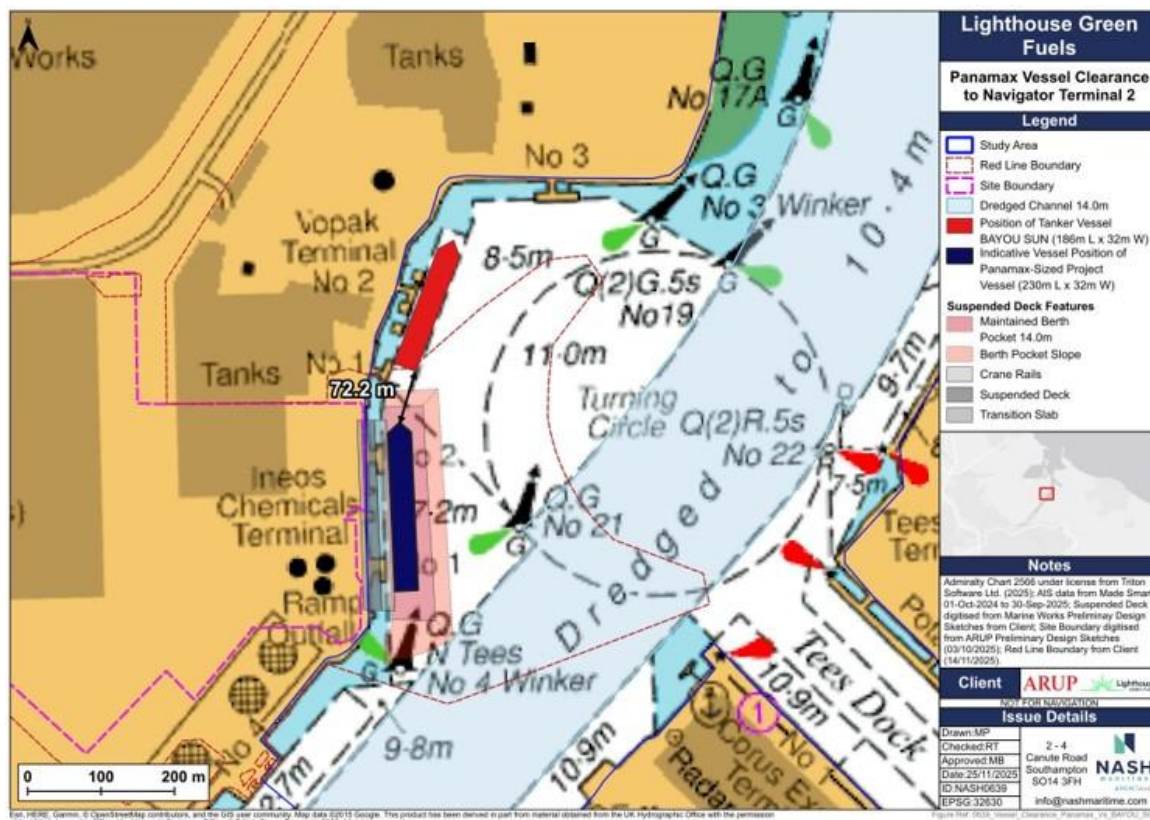
Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA.



Inset 5.10 Inbound arrival of tanker vessel Otto H in relation to the Proposed Development

Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA.

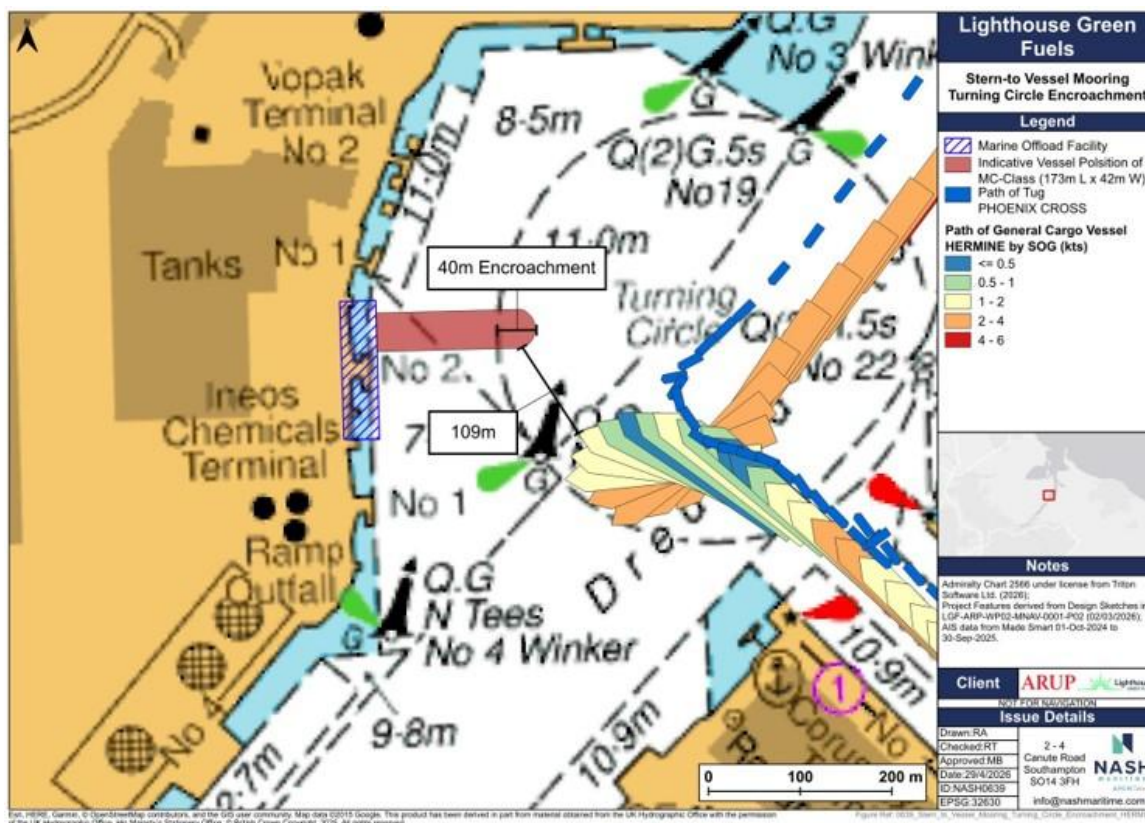
5.11.4 A reasonable worst-case assessment was undertaken to estimate the distance between the two vessels when a Panamax vessel is moored alongside the Proposed Development berth at the same time a large tanker (in this case a 186m LOA vessel) is moored alongside Navigator No. 2 Jetty. It indicates a distance of 72.2m between the bow of the Panamax and stern of the tanker – see Inset 5.11.



Inset 5.11 Distance between moored Panamax on Proposed Development berth and moored large tanker on Navigator Terminals No.2 Jetty

Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA.

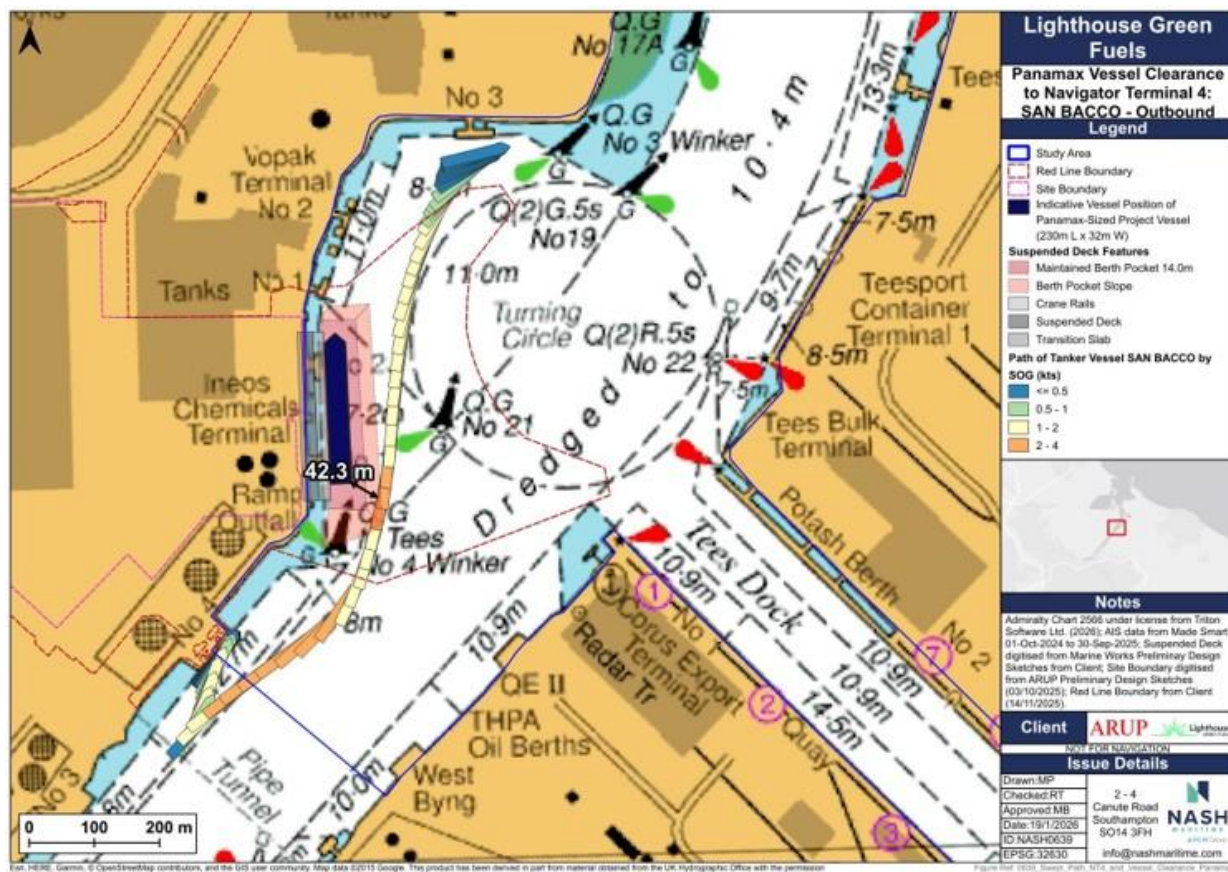
- 5.11.5 A further assessment was undertaken to consider the proposed impact of a stern-to (i.e. Mediterranean-moored) heavy lift vessel during an arrival of a vessel transiting into Tees Dock. Inset 5.12 shows the distance between the bow of a MC-class vessel and the turning circle is approximately 109m.



Inset 5.12 Stern to (med mooring) vessel clearance to turning circle

Arrivals & Departures at Navigator No.4 Jetty

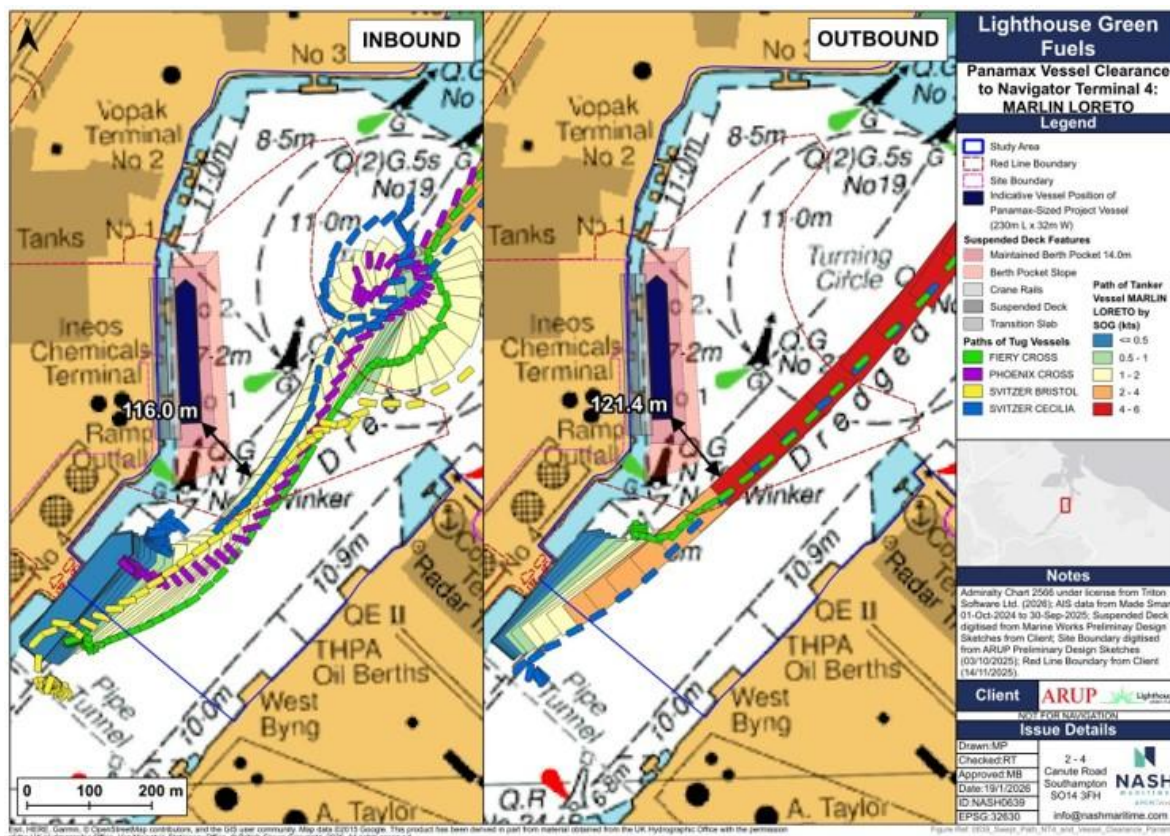
- 5.11.6 A reasonable worst-case assessment was undertaken to understand the Closest Point of Approach (CPA) in a scenario whereby a Panamax vessel is moored alongside the Proposed Development berth whilst a large tanker is either arriving at, or departing from, Navigator No. 4 Jetty.
- 5.11.7 On 14 October 2024, the 108m LOA tanker *San Bacco* made the closest transit past the Proposed Development berth as it departed Navigator Terminal No. 4 Jetty towards the Navigator Terminal No.3 Jetty. It indicates a distance of 42.3m between the stern of the Panamax and the bow of the *San Bacco* tanker as shown in Inset 5.13.



Inset 5.13 Indicative credible worst-case clearance distance between moored Panamax vessel and tanker departing Navigator Terminal No.4 Jetty

Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA.

- 5.11.8 Tankers arriving at Navigator Terminal No.4 Jetty will typically turn within the Turning Circle in the main river and go astern to the berth. Inset 5.14 shows a typical arrival and departure of one of the largest tankers undertaking this transit. This swept path represents the 250m LOA *Marlin Loreto*'s arrival on 2 May 2025 where the vessel had a CPA of 116m from the stern of a 230m LOA Panamax vessel moored centrally on the Proposed Development berth.
- 5.11.9 During its departure four days later on 6 May 2025, the vessel can be seen to utilise a central position within the authorised channel. The Outbound graphic within Inset 5.14 shows that, should there have been a Panamax vessel moored centrally on the Proposed Development berth, the *Marin Loreto* would have been approximately 121m away at its closest point when making the departure.



Inset 5.14 Indicative clearance distance between moored Panamax vessel during inbound and outbound transit to Navigator Terminal No.4 Jetty

Note: This figure shows a superseded Site boundary (shown in red) which was used to support discussions with stakeholders while developing this NRA. The final Site boundary has subsequently been refined and reduced in extent. The figure is retained for illustrative purposes and does not materially affect the findings of this NRA.

5.11.10 It should be noted that the CPA calculated for these vessel transits is hypothetical. In reality, vessels navigate according to the available navigable width. When manoeuvring vessel masters will utilise the available navigable width in order to perform the safest and most efficient manoeuvre as befits the conditions and circumstances on the day. It is highly unlikely that a passing vessel would in reality pass a moored Project Vessel with the same CPA.

Exposure analysis of Navigator Terminal Jetties Nos. 2 & 3

5.11.11 An exposure analysis was undertaken of tankers utilising Navigator Terminals No.2 and No.3 jetties using the AIS data for the period 1 October 2024 to 30 September 2025. Exposure analysis provides information on the time a vessel spends at a berth, in minutes, hours, days and weeks. Then a calculation can be made on the average time spent on the berth per week and per month.

5.11.12 The exposure analysis captured vessels entering the berth areas with a speed over the ground of <0.5kts within each area/box. The results are summarised in Table 5.4.

Table 5.4 Exposure analysis of tanker vessels utilising Navigator Terminal Jetty Nos. 2 & 3

Navigator Terminal No.	Total minutes per year	Total hours per year	Total Ddys per year	Total weeks per year	Average hours per week	Average hours per month
2	211,953.00	3,532.55	147.19	21.03	67.93	294.38
3	179,850.00	2,997.50	124.90	17.84	57.64	249.79

5.11.13 Navigator Terminal Jetty No.2 had a greater level of usage during the year, with a tanker occupying the berth on 147 days, or approximately 21 weeks (i.e. 40% of the year).

5.11.14 Navigator Terminal Jetty No.3 had slightly lower utilisation with approximately 125 days occupancy, or just under 18 weeks (34.3% of the year).

5.11.15 Therefore, over 50% of the time there were no vessels moored alongside either berth.

5.11.16 Navigator Terminals has advised that they have sold reserved capacity at their No. 2 and No. 3 Jetties that is not revealed within the AIS data as it was not necessarily taken up. A request for more information on this potential additional utilisation of these berths was requested from Navigator Terminals but has not been received in time for the completion of this NRA.

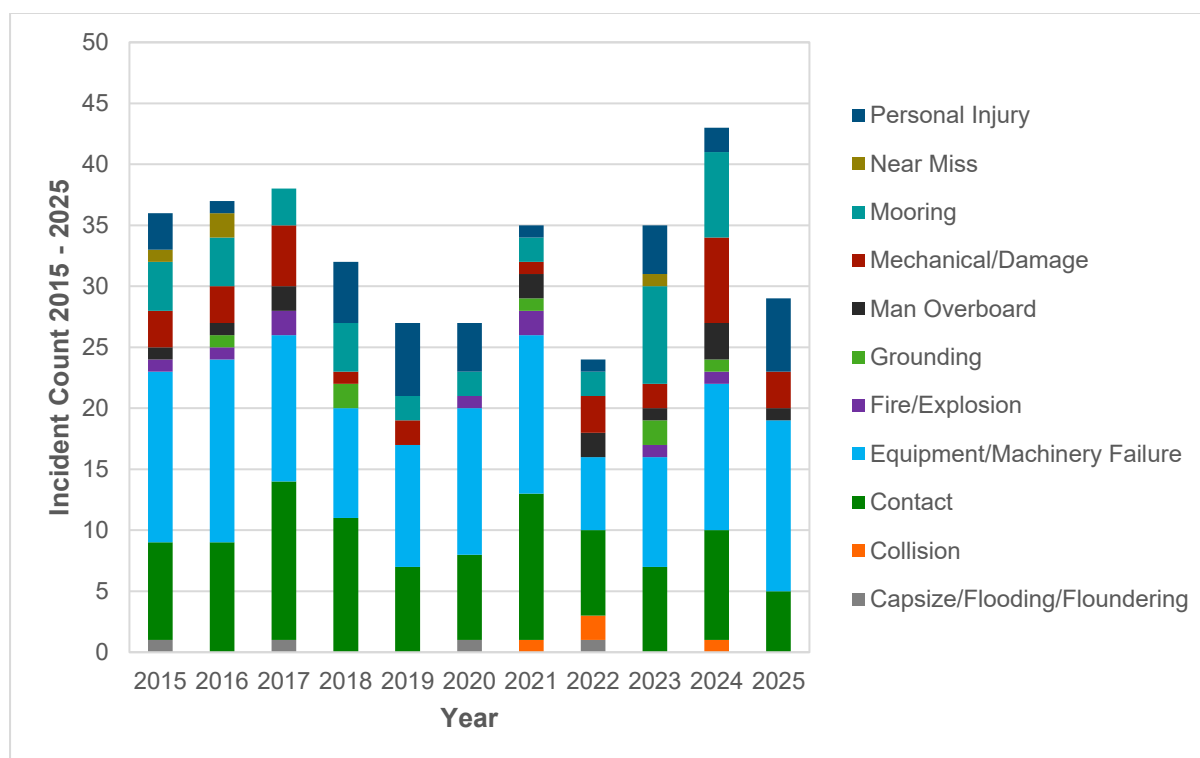
5.11.17 An estimate of a potential 25% utilisation uplift in vessel movements to Navigator Terminals No. 2 and No. 3 jetties from those figures presented in Table 5.1 was discussed with PDT Harbour Master during a meeting in April 2026 (see 6.6 for further information).

[Arrivals at Navigator No. 1 Jetty](#)

5.11.18 As stated in Section 4.5.2, Navigator Terminal No. 1 Jetty is non-operational and PDT pilots confirmed that has been the case for many years. The AIS data indicates that there were 54 movements to and from the jetty during the data capture period all by workboats which would indicate that tugs and small workboats are mooring alongside temporarily likely to be in advance, or on completion of, a vessel manoeuvre to/from an adjacent Navigator Terminal jetty. Whilst this report provides no vessel traffic assessment (due to no arrivals or departures by tankers to No.1 Jetty), Section 7.6 of this report provides further analysis on the impact on marine operations should No. 1 Jetty re-open in the future.

5.12 Incident analysis

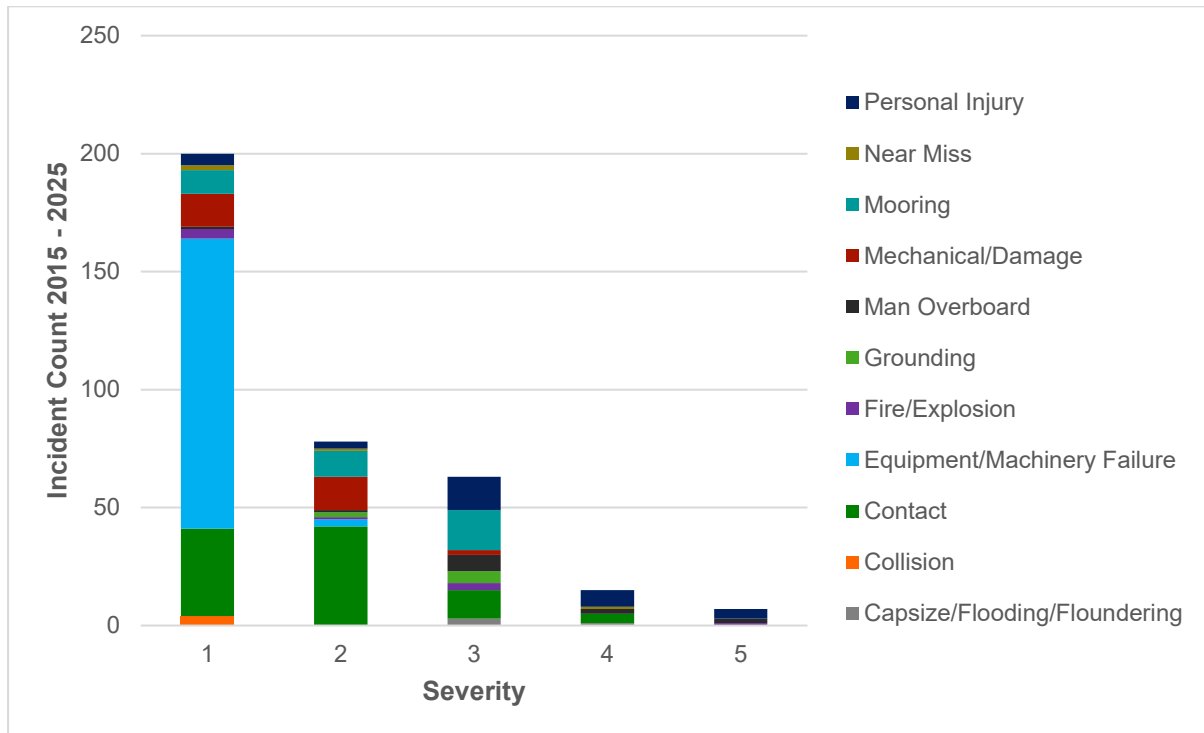
- 5.12.1 Analysis of historic incident data was undertaken to further an understanding of the nature of commonly occurring hazards within Teesport. This in turn helps to further inform assumptions regarding hazard frequency and consequence.
- 5.12.2 PDT provided historical incident records for ten years between January 2015 and September 2025. The number of incidents, by type, that occurred during this time are shown in Inset 5.15.
- 5.12.3 The most common type of incident was equipment/machinery failure with 126 individual incidents, which equates to approximately 12 incidents per year. Contact incidents were the second most frequent type of incident with 95 occurrences in the ten year period. Mooring incidents (such as parted lines) were the third most frequent with 38 reported incidents within the ten year period. Where a collision, contact, or grounding resulted from a mooring incident, the incident type was counted as the former. Grounding and collision incidents were comparatively infrequent, each occurring less than once per year with seven and four reports respectively.



Inset 5.15 Incident count by types (January 2015 – September 2025)

- 5.12.4 PDT rank incident occurrences from zero to five in terms of severity, with the severity of incidents ranked as zero being negligible and the severity of incidents ranked as five being significant.

5.12.5 The number of incident types by severity score 1 to 5 are presented in Inset 5.16. Most incidents were of negligible to low severity and predominantly consisted of contact and equipment failures. More severe, but far less frequent, incident types included man overboard and personal injuries.



Inset 5.16 Incident type and count by severity

- 5.12.6 Supplementary incident data was sourced from the following sources from the Marine Accident Investigation Branch (MAIB) incidents (2010-2024) and Royal National Lifeboat Institute (RNLI) callouts (2008-2024).
- 5.12.7 No relevant incidents were identified within RNLI callouts. The relevant recorded incidents from the MAIB data are summarised in Table 5.5.

Table 5.5 Relevant incidents within the marine navigation Study Area reported to the MAIB (2010 - 2024)

RNLI/ MAIB	Date	Vessel type	Description	Occurrence
MAIB	01/08/14	Cargo/tanker	Contact between manoeuvring cargo vessel and berthed oil tanker.	Serious
MAIB	01/10/17	Tanker	Collision between two chemical tankers whilst in port.	Less serious
MAIB	18/04/19	Cargo	Collision between bulk carriers in transit under pilotage and moored bulk carrier.	Serious
MAIB	01/12/20	Cargo	Engine failure – required tow.	Less serious
MAIB	01/10/21	Tanker	Grounding while manoeuvring astern to berth.	Less serious
MAIB	01/12/23	Tanker/Tug	Tug collided with its tow, and Liquefied Petroleum Gas tanker.	Serious
MAIB	01/08/24	Cargo	Contact with quay while under pilotage and swinging near berth.	Serious

6 Stakeholder engagement

6.1.1 The project team engaged with the following stakeholders in the preparation of this NRA:

- PDT Harbour Master and Deputy Harbour Master;
- Tees Bay Pilots;
- Tees Foyboatmen, Svitzer, Boluda (collectively described as Marine Service stakeholders) - this meeting was also being joined by the Applicant; and
- Navigator Terminals.

6.1.2 Additionally, the statutory consultation process (in accordance with Section 42 of the Planning Act 2008 (PA 2008)) for the Proposed Development elicited responses from third parties and where the comments raised were related to marine operations, these have been addressed within this NRA - see Section 6.7 for further details.

6.1.3 The purpose of this navigation stakeholder engagement was to inform the project NRA through local marine subject matter expert knowledge and define hazards and appropriate risk control measures to reduce any navigational risks associated with marine aspects of the Proposed Development.

6.1.4 Views from key local navigational stakeholders were sought on the following:

- new navigation-related hazards that could emerge as a result of the Proposed Development (contact, grounding, collision);
- the likelihood and potential consequence of hazard occurrences (i.e. risks) to people, property, business and the environment; and
- views on suitable means to mitigate any identified risks (e.g. risk controls such as buoyage and markings, procedures, communication).

6.2 Kick-off meeting with PDT and scheme promoter

6.2.1 At the commencement of the NRA, a project kick-off meeting was held on 3 October 2025 between the PDT Harbour Master, representatives from the Applicant, Arup, and personnel from NRA project team.

6.2.2 The purpose of the meeting was to agree the parameters of the NRA, together with the geographical limits of the chosen Study Area and chosen navigation risk assessment approach. A copy of the minutes of this meeting can be found in Annex A.

6.3 Tees Bay Pilots

- 6.3.1 A meeting was held between NRA project team and a Tees Bay Pilot (referred to as JP), on 13 November 2025 via MS Teams. The purpose of the meeting was to review the NRA scope and study area, provide a summary of the project phases, type of marine activity and anticipated number of project vessels in order to seek input on potential navigational impacts presented by the Proposed Development. A copy of the minutes can be found in Annex B.
- 6.3.2 In response to anticipated project vessels, JP indicated that the port currently restricts vessels over 200m LOA from passing a similar sized vessel within the authorised channel. Therefore, deconfliction of project vessel transits with third party transits will actively be managed by VTS.
- 6.3.3 The Mediterranean mooring position of an MC-class vessel was discussed and its proximity to both the turning circle and authorised channel. On review, JP considered this to pose no additional risk to current port operations.
- 6.3.4 JP recommended that the placement of the Buoy No. 21 should be discussed with PDT Harbour Team.
- 6.3.5 JP confirmed that Navigator Terminal No.1 Jetty has not been used in 20 years and is therefore not likely to cause interference with the Proposed Development.
- 6.3.6 JP confirmed that Navigator Terminal No.2 Jetty is frequently used, although the typical tanker in his opinion is 90m to 100m LOA and therefore the NRA analysis considers a worst-case scenario.
- 6.3.7 JP concluded that the only potential hazard identified was during the berthing operation of tanker at Navigator Terminal No.2 Jetty when there is a Panamax vessel alongside at the Proposed Development berth. JP agreed to further discuss this issue with his colleagues and respond.
- 6.3.8 A post meeting note was recorded in the minutes as JP responded to the project team via email on 14 November 2025 saying that the drawings had been further reviewed with colleagues and that overall, all operations would be achievable at both terminals.

6.4 Marine service contractors

- 6.4.1 A meeting was held via MS Teams with the representatives from the marine services contractors (namely Foyboatmen, Svitzer Marine and Boluda Towage) to discuss the Proposed Development and risk analysis on 14 November 2025. The meeting was also attended by PDT Deputy Harbour

Master, representatives from NRA project team, and the Applicant. A copy of the minutes can be found in Annex C.

- 6.4.2 The purpose of the meeting was to review the NRA scope and study area, provide a summary of the Proposed Development phases, type of marine activity and anticipated number of project vessels in order to seek input on potential navigational impacts presented by the Project.
- 6.4.3 The representative from Boluda raised the question of marine service availability during high tides. The NRA project team indicated that it is likely that private towage contractors will be used during phase 1 though port towage providers are likely to be used for other phases.
- 6.4.4 Participants assessed that encroachment of an MC-class vessel, moored in a Mediterranean configuration, and the turning circle presented a minimal navigation risk because vessels transiting to Tees Dock will swing well to the east of the limit of the turning circle.
- 6.4.5 The question was raised as to how a Med-moored MC-class vessel will be anchored. It was thought that a pre-set anchor could be a cause of further navigation risk and it was agreed that the project team would raise this during discussion with PD Teesport Harbour Team.
- 6.4.6 Participants also assessed that there was adequate navigational width for a Panamax size vessel to safely manoeuvre on to the Proposed Development berth when a large tanker is moored alongside Navigator Jetty No. 2 Jetty.
- 6.4.7 Participants agreed that during dredging operations, arrivals to Navigator No. 2 Jetty would need to be paused/deconflicted.
- 6.4.8 The Foyboatmen representative raised the issue of the existing infrastructure on the former INEOS jetties/infrastructure to be assessed prior to any planned mooring operations to ensure safety of personnel.

6.5 Risk analysis workshop with PDT

- 6.5.1 A meeting was held via MS Teams with the Harbour Master (HM) and Deputy Harbour Master (DHM) to discuss the Proposed Development and risk analysis on 17 November 2025. The meeting was also attended by representatives from NRA project team and Arup's project manager. A copy of the minutes can be found in Annex D.
- 6.5.2 The objectives of the session were to:
- re-cap on the NRA scope, approach, methodology and previously agreed parameters from the kick-off meeting (held on 3 October 2025);
 - go through the overview of each phase of the Proposed Development;

- provide a summary of the vessel traffic analysis and review marine incident data; and
 - review and discuss both key navigational impacts and hazard identification.
- 6.5.3 When discussing the NRA scope, the harbour master confirmed that the Proposed Development export activities during the operational phase will be considered as “business as usual” as there are three terminals in close proximity to the Proposed Development site which could handle the export.
- 6.5.4 The extent of dredging outside of the main dredged pocket was discussed and noted that the approach channel between the turning circle and the Proposed Development berth would be dredged to circa. -10.4m. It was noted by the HM that the existing AtoN Buoy No. 21 would most likely be superfluous once dredging is complete (as the turning circle dredged depth would be the same as the approach depth to the Proposed Development berth) and that North Tees No. 4 Winker buoy would need to be temporarily removed during dredging operations to avoid contact incidents.
- 6.5.5 A schematic of the proposed Mediterranean-mooring of an MC-class heavy lift vessel was discussed. The HM was satisfied that, on the few occasions that a MC Class vessel would moor in this position, even with anchor encroachment in the turning circle, navigational risk could be safely managed.
- 6.5.6 The swept path graphic (Inset 5.12) of the arrival of the general cargo vessel *Hermine* was discussed. The HM opined this presented a worst-case scenario manoeuvre and confirmed there would be sufficient distance between the moored vessel and the vessel manoeuvring within the turning circle.
- 6.5.7 A further discussion took place on the potential navigational interaction of a large tanker bound for Navigator No. 2 Jetty whilst a Panamax vessel was moored alongside the former INEOS site (see Inset 5.11). The HM believed clearance distances are sufficient enough for the two operations to co-exist without interference or conflict.
- 6.5.8 In summary, the HM stated that the existing traffic control system in place (which limits 200 m+ vessels moving when there is another vessel movement scheduled in the channel) is a successful de-confliction risk control. He acknowledged that there will be additional workboats in the Port, with some masters and crew not necessarily being too familiar with the environment. However, extra time will be needed to familiarise these crew members appropriately.

6.5.9 Finally, the HM and DHM provided confirmation of the hazards to be scoped in and out of the navigation risk assessment which are recorded in the meeting minutes.

6.6 Navigator Terminals

6.6.1 The results of a preliminary Navigation Risk Assessment were presented to representatives from Navigator Terminals held over Microsoft Teams on 13 February 2026.

6.6.2 During this meeting, the Head of New Energy Markets at Navigator Terminals stated that he did not recognise the utilisation figures for No.2 and No.3 Jetties stated in the presentation – it was his belief that they are under-represented. Navigator Terminals also highlighted that there is an intention in the future to re-open Jetty No.1 and asked whether this had been taken into account. As no traffic had been recorded using No.1 Jetty, a request was made for more information to be provided on this, including proposed vessel types, dimensions and the nature of proposed use. At the point of submitting this NRA, this information had not been received. Notes from the meeting can be seen in Annex E.

6.7 S.42 Statutory consultation responses

Navigator Terminals

6.7.1 A summary of Navigator Terminals (NT) written comments in response to the PEIR Report and in relation to Shipping and Navigation are summarised in Table 6.1.

Table 6.1 Navigator Terminals S.42 statutory consultation response

Navigator Terminals Comment	Response
NT are a key operator of 4 berths within the port with three located on the Seal Sands Terminal (Jetty 1, 2 and 3) and one located at the North Tees Terminal (Jetty 4). They operate 24/7 365 days a year and highlight the critical importance of maintaining depths and access to all the Jetties via the port channel, as well as turning circles and berth depths. Changes to the existing access arrangements has the potential to disrupt operations and impact upon NTs' commercial service offering.	Noted
Additional marine traffic could potentially impede vessels approaching or leaving the NTs' Jetties (1-4), resulting in significant operational impacts. It will be vital for LGF to present assessments that demonstrate how	Since this comment was made the results of the preliminary NRA have been discussed with NT and this has been assessed within the NRA. Additionally, risk mitigation has been discussed with PDT to safely manage increased levels of marine traffic.

Navigator Terminals Comment	Response
such operations will be managed to avoid these impacts.	
There is little information presented on exclusion zones (loading, unloading and sailing) and explosion risk. This may represent a long-term operational risk that could impact the productivity of NTs' facilities. Larger passing vessels may affect the loads on mooring lines for at-berth vessels. These loads must be quantified to determine their effect on the Minimum Breaking Load (MBL).	None of the project cargoes pose an explosion risk, as such there are no exclusion zones. A request was made for NT to supply any exclusion zones to their own terminals/jetties, but this information had not been received at the point of the submission. Vessels moving within, and to the north of, the turning circle will be proceeding at slow speed, with tugs in assistance. Impact of wave wash on neighbouring jetties was considered in the NRA but was scoped out for the reasons stated above.
They note with significant concern that the latest Proposed Order Limits seem to encompass the NT's North Tees Jetty No. 4 frontage (including jetty and mooring infrastructure) and the Navigator Terminal's Seal Sands No.1 Jetty upstream dolphin. NT must be able to continue to operate, inspect, maintain and repair these critical facilities on which its operations rely. To the extent that works are proposed at this location, it should be noted that this is a complex asset with multiple pipelines converging from an array of vessels across the wider NT sites. There is limited capacity for additional infrastructure, and any works must be carefully planned and executed in order to manage major accident hazard risks as well as operational impacts on NT.	Noted. The Site boundary (Order Limits) has since been revised and no longer encompass Jetty No.4. Arrivals and departures to Jetty No.4 have been assessed within the NRA and show sufficient clearance away from the proposed largest vessel when moored alongside the Proposed Development. In any case, the revised Site boundary now excludes Jetty No.4.

Maritime and Coastguard Agency (MCA)

- 6.7.2 A summary of the Maritime and Coastguard Agency written comments in response to the PEIR Report and in relation to Shipping and Navigation are summarised in Table 6.2.

Table 6.2 Maritime and Coastguard Agency S.42 statutory consultation response

Summary	Response
Statement to engage PDT as SHA.	Already actioned as part of NRA discussions.
Request to add Marine and Coastal Access Act 2009 to be listed table of legislation references in NRA.	Added.
Confirmation requested that a Hazard Identification Workshop with key stakeholders was part of NRA process.	Navigation hazard ID has been discussed thoroughly with PDT's Harbour Master with separate engagement with Tees Bay Pilots and marine services' representatives. This is documented in this report.

As AIS data does not capture all vessel traffic including smaller fishing and recreational vessels, MCA understand that the applicant is to engage with local fishing associations and recreational sailing clubs to ensure this vessel activity is captured in the NRA.	PDT Harbour master confirmed in meeting in October 2025 when discussing NRA scope that there is no recreational nor fishing activity taking place in the Study Area.
It is recommended that the establishment of a new facility conforms to the PMSC and its Guide to Good Practice (2025). The developer will need to produce a Safety Management System under this Code and it should be discussed with the SHA.	This will be addressed following the outcome of the DCO process.

6.8 Final consultation with PDT

- 6.8.1 As part of this NRA update, NASH maritime staged a meeting with PDT on the 27 April 2026. The purpose of the meeting was to update the Harbour Master on the revised changes to the Proposed Development (e.g. quay construction design, slight changes in marine operations to support each phase, revised position of Marine Offloading Facility and consequent new position of Mediterranean-moored MC Class HLV) in order to elicit feedback on navigation risk. The following discussion items were also raised:
- the additional reserved capacity at Navigator Terminal No. 2 and No. 3 Jetty being realised and any consequent impact from on/with the Proposed Development; and
 - potential re-opening of Navigator Terminal No.1 Jetty and management of arrivals and departures at neighbouring terminals within the Study Area.
- 6.8.2 The summary conclusion of the meeting was that the revised changes to the Proposed Development did not warrant further additional risk control measures from those previously identified. A request was made by the Harbour Master for more information on the bund design for the quay construction, but it was not felt that this would materially change the risk profile. Full meeting minutes of this consultation can be found in Annex E.

7 Navigation risk assessment

7.1 Introduction

7.1.1 This section gives an overview of the NRA process and includes:

- a summary of the risk assessment methodology;
- an overview of hazard and risk control identification;
- results of the baseline, project and residual assessments of navigation risk;
- analysis of the key navigational issues that impact navigation risk; and
- a summary of the identified additional risk controls.

7.1.2 Full hazard logs can be viewed in Annex G.

7.2 Risk assessment methodology

7.2.1 This NRA adopts the risk assessment methodology utilised in the Teesport Port Wide Risk Assessment and includes the same identified vessel types, hazards and baseline port risk scores. This approach allows for a direct comparison between the current navigational risk profile within the Teesport Port-wide Risk Assessment (baseline risk) and that with the future project marine operation scenario (project risk).

7.2.2 The NRA methodology is fundamentally based on the Formal Safety Assessment methodology as adopted by the International Maritime Organisation (IMO) [Ref 8]. It also follows the guidance set out within the PMSC. The methodology was agreed with PDT at the outset.

7.2.3 The Teesport Port Wide Risk Assessment was undertaken by Marico Marine and utilised Marico's Hazman II program to provide ranked risk reports.

7.2.4 The scoring methodology utilised by Hazman II has been duplicated by the NRA project team to ensure the risk scoring for the project and residual risk assessments is aligned with the scoring methodology used to generate the baseline risk scores extracted from the Teesport Port Wide Risk Assessment.

7.2.5 The risk assessment process aims to ascertain risk levels and specify the requirement to implement measures to mitigate risk to acceptable levels, in line with the As Low As Reasonably Practicable (ALARP) principle. The NRA is based on the following criteria which are taken from the Teesport Port Wide Risk Assessment:

- frequency parameters – the anticipated frequency of incident occurrence, (see Table 7.1);
- consequence parameters – the expected consequence of each hazard were it to occur. This has been scored separately for consequences to people (loss of life), environment (pollution), property (damage) and business (reputational/economic impacts), (see Table 7.2).
Environmental impacts refers to defined pollution response “Tiers” as per the UK’s National Contingency Plan;
- risk matrix – based on the frequency and each of the four consequence scorings, risk scores were derived using a risk matrix (see Table 7.3); and
- risk classification - based on the resulting risk score, the risk was classified from ‘Negligible’ where safety is unaffected, through to ‘High Risk’ a level of risk requiring immediate action, (see Table 7.4).

Table 7.1 Frequency parameters

Scale	Description	Definition
5	Frequent	An event that could be expected to occur more than once per year.
4	Likely	An event that could be expected to occur between 1 to 10 years.
3	Possible	An event that could be expected to occur between 10 to 100 years.
2	Unlikely	An event that could be expected to occur between 100 to 1000 years.
1	Remote	An event that could be expected to occur less than once in 1000 years.

Table 7.2 Consequence parameters

Cat	People	Property damage	Environmental impacts	Stakeholder/Port impacts
1	Negligible Possible very minor injury (e.g. bruising)	Negligible Costs <£10k	Negligible No effect of note. Tier 1 may be declared but criteria not necessarily met Costs <£10k	Negligible Costs <£10k

Cat	People	Property damage	Environmental impacts	Stakeholder/Port impacts
2	Minor (single minor injury)	Minor Minor damage Costs £10k – £100k	Minor Tier 1 – Tier 2 criteria reached. Small operational (oil) spill with little effect on Environmental amenities CEAS Site warning Costs £10K–£100k	Minor Bad local publicity and/or short-term loss of revenue Costs £10k – £100k
3	Moderate Multiple minor or single major injury	Moderate Moderate damage Costs £100k - £1M	Moderate Tier 2 spill criteria reached but capable of being limited to immediate area within site COMAH site evacuation Costs £100k -£1M	Moderate Bad widespread publicity temporary suspension of operations or prolonged restrictions Costs £100k - £1M
4	Major Multiple major injuries or single fatality	Major Major damage Costs £1M -£10M	Major Tier 3 criteria reached with pollution requiring national support. Chemical spillage or small gas release COMAH local evacuation Costs £1M - £10M	Major National publicity, Temporary closure Costs £1M -£10M
5	Catastrophic Multiple fatalities	Catastrophic Catastrophic damage Costs >£10M	Catastrophic Tier 3 oil spill criteria reached. International support required. Widespread shoreline contamination. Serious chemical or gas release. Significant threat to Environmental amenity. COMAH major area evacuation Costs >£10M	Catastrophic International media publicity. Operations and revenue seriously disrupted for more than two days. Ensuing loss of revenue. Costs >£10M

Table 7.3 Risk matrix

FREQUENCY	Frequent	5	0	5.9	8.3	9.4	10
	Likely	4	0	3.5	5.9	7.4	8.3
	Possible	3	0	2.4	4.4	5.9	7
	Unlikely	2	0	1.8	3.5	4.9	5.9
	Remote	1	0	1.5	2.9	4.1	5.1
			1	2	3	4	5
			Negligible	Minor	Moderate	Serious	Major
CONSEQUENCE (IMPACT)							

Table 7.4 Risk classification

Hazard risk score	Risk definition	Action taken
0 – 1.99	Negligible risk	A level where operational safety is unaffected.
2 – 3.99	Low risk	A level where operational safety is assumed.
4 – 5.99	As Low As Reasonably Practicable (ALARP)	A level defined by study at which risk control in place is reviewed. It should be kept under review in the ensuing Safety Management System.
6 – 7.99	Significant risk	A level where existing risk control is automatically reviewed, and suggestions made where additional risk controls could be applied if appropriate. Significant risk can occur in the average case or in individual categories. New risk controls identified should be introduced in a timescale of two years.
8 – 10	High risk	A level requiring immediate mitigation.

7.2.6 Risk is calculated for each consequence category (e.g. people, property, environment and business) based on the scores in the hazard log, using the risk matrix. Risk scores are calculated for each hazard under the “Most Likely” and “Worst Credible” scenarios for each of the consequence criteria. This generates eight individual risk scores per hazard. These individual risk scores are documented in the “Ranked Hazard Lists”. The risk scores are then analysed further to obtain four indices for each hazard as follows:

- the average risk score of the categories in the ‘most likely’ set;

- the average risk score of the categories in the ‘worst credible’ set;
 - the maximum risk score of the categories in the ‘most likely’ set; and
 - the maximum risk score of the categories in the ‘worst credible’ set.
- 7.2.7 These indices are averaged to produce a single numeric risk value representing an aggregate individual risk score weighted towards higher scoring components. The hazard list is then sorted in order of the aggregated risk score to produce a ‘Ranked Hazard List’ with the highest risk hazards prioritised at the top. The ranked hazard list documents the individual category risk scores in more detail.
- 7.2.8 All risk scores, whether individual per consequence category, or overall for a hazard, are scored on a scale of 0 (low risk) to 10 (high risk). Where the resultant risk levels cannot be considered in the low/negligible risk range, possible risk controls/mitigation measures are identified for implementation.
- 7.2.9 ALARP can be accepted as being “Tolerable”, if the further reduction of the risk is impracticable, or if the cost of such reduction would be highly disproportionate to the improvement. It can also be considered “Tolerable”, if the cost of reducing the risk is greater than any improvement gained.
- 7.2.10 Put simply risk can only be ALARP if all reasonable measures have been put in place to reduce risk to “Tolerable” levels. If a hazard scores within the “ALARP risk” classification category this does not automatically mean the hazard can be classified as ALARP and therefore “Tolerable”. If the level of risk remains within the ALARP zone following the application appropriate and proportionate additional risk control measures, then the level of risk can be deemed “Tolerable” providing the cost of introducing further risk control measures is disproportionate to the level or risk reduction anticipated.
- 7.3 Hazard identification**
- 7.3.1 The hazards identified for this NRA are taken from the Teesport Port Wide Risk Assessment.
- 7.3.2 The vessel types and hazard types identified in the Teesport Port Wide Risk Assessment, and deemed pertinent to the NRA, are summarised in Table 7.5 and Table 7.6 respectively. Where vessel and/or hazard types are not taken forward into the NRA, this is due to risk exposure level being determined as negligible based on the analysis of baseline data and consultation with stakeholders.

Table 7.5 Vessel types

Vessel Types	Detail	Included in NRA?
Tanker	Product Tanker, Crude Oil Tanker, Gas Carriers.	Yes
General Cargo Vessels	General Cargo, Container, Non-liquid bulk, Ferries, Wind Farm Construction vessels.	Yes
Project Cargo	Project Cargo Vessels i.e. oil rigs for hot/cold lay-up and vessels cold moved to dock. For the purposes of this NRA Project Cargo includes all vessels transporting bulk materials and AILs to the LGF site.	Yes
Workboats	Tugs, Pilot boats, Workboats, PDT vessels, Windfarm support vessels and Fishing Vessels (Not fishing). For the purposes of this NRA Workboats include all vessels associated with the dredging and construction phase of the LGF project. For example, JUB, Tugs, Dredger)	Yes
Fishing Vessels	Fishing Vessels (fishing).	No
Recreational Vessels	Sailing Yachts, Motor Yachts, Sailing Dinghies, Rigid Hull Inflatable Boats, Personal Watercraft	No

Table 7.6 Hazard types

Hazard category	Definition	Scoped In or Out?
Anchor Dragging	When a vessel unintentionally moves from its anchored position because the anchor has failed to hold.	Scoped in for Project Cargo vessels only.
Collision	When two or more vessels impact each other whilst manoeuvring.	Scoped in
Contact	When one or more vessels makes physical contact with a fixed object such as a pier/jetty or a mooring buoy. This hazard is sometimes referred to as “allision” when contact is made with a fixed structure, or a “striking” when contact is made with a floating structure (e.g. navigation buoy or anchored or moored ship).	Scoped in
Diving	Diving incident involving Recreational or Commercial diving.	Scoped in for phase 1 only
Girting	Sometimes referred to as “Girding”. This is when a towline under tension exerts a heeling moment which results in excessive heel that could cause the tug to capsize.	Scoped in
Grounding	When a vessel unintentionally makes contact with the seabed.	Scoped in
Mooring Incident/Breakout	When a vessel ranges (moves excessively) whilst alongside the berth or when one or more mooring lines fail resulting in the vessel unintentionally breaking away from its moored position.	Scoped in for Project Cargo vessels and Workboats only
Foundering/Swamping	When a vessel fills with water, and when overwhelmed, sinks.	Scoped out
Fire and Explosion	No definition provided in Teesport Port Wide Risk Assessment.	Scoped out

7.3.3 A hazard identification exercise was carried out for each of the three phases of the Proposed Development. This revealed that some hazards could be applied to all phases, whilst others only applied to a singular phase. A summary of this assessment can be seen in Table 7.7. Note, the Hazard ID numerical references are taken from the Teesport Port Wide Risk Assessment. Only those relevant to the river Tees within the study area are captured in this table, so the Hazard ID references are not sequential.

Table 7.7 Hazard identification per each project phase

		Marine operation phase relevance		
HAZ-ID	Hazard Title (Teesport Portwide NRA)	Phase 1 - Construction / dredging	Phase 2 Construction of LGF Plant	Phase 3 Operation of LGF Plant
1	Contact vessel alongside berth - Workboat	Yes	Yes	Yes
2	Collision - Tanker In Collision With (ICW) Tanker	No	No	No
3	Collision - Workboat ICW Project Cargo	No	Yes	Yes
5	Grounding - General Cargo Vessel	No	No	No
6	Contact vessel alongside berth - Recreational Vessel	No	No	No
9	Grounding - Workboat	Yes	Yes	Yes
10	Tug Girting	Yes	Yes	Yes
11	Diving Incident	Yes	No	No
12	Contact berth - General Cargo Vessel	No	No	No
13	Collision - General Cargo Vessel ICW General Cargo Vessel	No	No	No
14	Contact berth - Workboat	Yes	Yes	Yes
16	Collision - General Cargo Vessel ICW Workboat	Yes	Yes	Yes
18	Contact berth - Recreational Vessel	No	No	No
20	Grounding - Recreational Vessel	No	No	No
21	Collision - Workboat ICW Recreational Vessel	No	No	No
22	Collision - Tanker ICW Project Cargo	No	Yes	Yes
23	Contact vessel alongside berth - Project Cargo Vessel	No	Yes	Yes
25	Grounding - Project Cargo	No	Yes	Yes
27	Collision - General Cargo Vessel ICW Project Cargo	No	Yes	Yes
28	Contact berth - Tanker	No	No	No
29	Foundering/Swamping - All vessels	No	No	No

		Marine operation phase relevance		
HAZ-ID	Hazard Title (Teesport Portwide NRA)	Phase 1 - Construction / dredging	Phase 2 Construction of LGF Plant	Phase 3 Operation of LGF Plant
30	Contact vessel alongside berth - General Cargo Vessel	No	Yes	Yes
31	Collision - Tanker ICW General Cargo Vessel	No	No	No
34	Contact berth - Project Cargo Vessel	No	Yes	Yes
35	Collision - Workboat ICW Workboat	Yes	Yes	Yes
36	Collision - Tanker ICW Recreational Vessel	No	No	No
37	Contact Transporter Bridge Gondola, fixed bridge or overhead cables - All Vessels	No	No	No
38	Mooring Incident - All Vessel	Yes	Yes	Yes
39	Collision - Tanker ICW Workboat	Yes	Yes	Yes
41	Collision - Project Cargo ICW Recreational Vessel	No	No	No
42	Contact vessel alongside berth - Tanker	Yes	Yes	Yes
43	Grounding - Tanker	No	No	No
45	Collision - Recreational Vessel ICW Recreational Vessel	No	No	No
46	Collision - General Cargo Vessel ICW Recreational Vessel	No	No	No
48	Contact - Vessel with Navigation Buoy	Yes	No	No
49	Contact Container Cranes - General Cargo vessel	No	No	No
50	Tees Dock No.1 Quayside Contact CSU & Liebherr - General Cargo vessel	No	No	No
53	Collision - Fishing Vessel ICW Fishing Vessel	No	No	No
54	Collision - Fishing Vessel ICW Recreational Vessel	No	No	No
55	Collision - General Cargo Vessel ICW Fishing Vessel	No	No	No
56	Collision - Project Cargo ICW Fishing Vessel	No	No	No
59	Grounding - Fishing Vessel	No	No	No

		Marine operation phase relevance		
HAZ-ID	Hazard Title (Teesport Portwide NRA)	Phase 1 - Construction / dredging	Phase 2 Construction of LGF Plant	Phase 3 Operation of LGF Plant
60	Contact berth - Fishing Vessel	No	No	No
61	Contact vessel alongside berth - Fishing Vessel	No	No	No

7.4 Baseline risk assessment

7.4.1 A hazard log for each phase of the Proposed Development can be seen in Annex G. For the remainder of this section a summary of risk is provided, broken down by phase.

Phase 1

7.4.2 The hazard risk scores for hazards identified as being materially impacted by the proposed phase 1 marine operation were taken from the Teesport Port Wide Risk Assessment and constitute the baseline risk assessment for this NRA.

7.4.3 Note, the baseline risk assessment assumes that all of the baseline risk controls identified in Table 4.1 are implemented and effective.

7.4.4 The baseline risk assessment for the phase 1 marine operation is summarised in Table 7.8.

7.4.5 The 10 baseline hazard risk scores for the phase 1 marine operation result in:

- three hazards scoring as “negligible risk”;
- seven hazards scoring as “low risk”;
- one hazard scoring as “ALARP” risk;
- zero hazards scoring as “significant risk”; and
- zero hazards scoring as “high risk”.

Table 7.8 Phase 1 baseline risk assessment

ID	Baseline rank	Hazard title	Baseline risk
42	3	Contact vessel alongside berth - Tanker	4.83
35	16	Collision - Workboat ICW Workboat	3.32
39	15	Collision - Tanker ICW Workboat	3.35
16	12	Collision - General Cargo Vessel ICW Workboat	3.46
38	24	Mooring Incident - All Vessel	2.76
10	27	Tug Girting	2.63
14	28	Contact berth - Workboat	2.58
11	35	Diving Incident	1.95
9	44	Contact - Vessel with Navigation Buoy	1.83
1	41	Contact vessel alongside berth - Workboat	1.53
48	38	Grounding - Workboat	1.32

Phase 2

- 7.4.6 The hazard risk scores for hazards identified as being materially impacted by the proposed phase 2 marine operation were taken from the Teesport Port Wide Risk Assessment and constitute the baseline risk assessment for this NRA.
- 7.4.7 The baseline risk assessment for the phase 2 marine operation is summarised in Table 7.9, specifically the risk without the Proposed Development.
- 7.4.8 The 16 baseline hazard risk scores for the phase 2 marine operation result in:
- four hazards scoring as “negligible risk”;
 - 10 hazards scoring as “low risk”;
 - two hazards scoring as “ALARP” risk;
 - zero hazards scoring as “significant risk”; and
 - zero hazards scoring as “high risk”.

Table 7.9 Phase 2 baseline risk assessment

ID	Baseline rank	Hazard title	Baseline risk
42	3	Contact vessel alongside berth - Tanker	4.83
30	4	Contact vessel alongside berth - General Cargo Vessel	4.70
16	12	Collision - General Cargo Vessel ICW Workboat	3.46
39	15	Collision - Tanker ICW Workboat	3.35
35	16	Collision - Workboat ICW Workboat	3.32
22	19	Collision - Tanker ICW Project Cargo	3.26
38	24	Mooring Incident - All Vessel	2.76
27	26	Collision - General Cargo Vessel ICW Project Cargo	2.65
10	27	Tug Girting	2.63
14	28	Contact berth - Workboat	2.58
3	29	Collision - Workboat ICW Project Cargo	2.56
25	29	Grounding - Project Cargo	2.56
23	39	Contact vessel alongside berth - Project Cargo Vessel	1.74
34	40	Contact berth - Project Cargo Vessel	1.64
1	41	Contact vessel alongside berth - Workboat	1.53
9	44	Grounding - Workboat	1.32

Phase 3

- 7.4.9 The hazard risk scores for hazards identified as being materially impacted by the proposed phase 3 marine operation were taken from the Teesport Port Wide Risk Assessment and constitute the baseline risk assessment for this NRA.
- 7.4.10 The baseline risk assessment for the phase 3 marine operation is summarised in Table 7.10.
- 7.4.11 The 16 baseline hazard risk scores for the phase 3 marine operation result in:
- four hazards scoring as “negligible risk”;
 - 10 hazards scoring as “low risk”;
 - two hazard scoring as “ALARP” risk;
 - zero hazards scoring as “significant risk”; and

- zero hazards scoring as “high risk”.

Table 7.10 Phase 3 baseline risk assessment

ID	Baseline rank	Hazard title	Baseline risk
42	3	Contact vessel alongside berth - Tanker	4.83
30	4	Contact vessel alongside berth - General Cargo Vessel	4.70
35	16	Collision - Workboat ICW Workboat	3.32
39	15	Collision - Tanker ICW Workboat	3.35
16	12	Collision - General Cargo Vessel ICW Workboat	3.46
22	19	Collision - Tanker ICW Project Cargo	3.26
38	24	Mooring Incident - All Vessel	2.76
27	26	Collision - General Cargo Vessel ICW Project Cargo	2.65
10	27	Tug Girting	2.63
14	28	Contact berth - Workboat	2.58
3	29	Collision - Workboat ICW Project Cargo	2.56
25	29	Grounding - Project Cargo	2.56
23	39	Contact vessel alongside berth - Project Cargo Vessel	1.74
34	40	Contact berth - Project Cargo Vessel	1.64
1	41	Contact vessel alongside berth - Workboat	1.53
9	44	Grounding - Workboat	1.32

7.5 Key navigational issues

- 7.5.1 This section summarises the key navigational issues that contribute to the modest increase in navigation risk between the baseline and project assessments of risk.
- 7.5.2 Minimal increases in navigation risk between the baseline and project risk assessments are noted for tanker, cargo and project vessels. These increases are driven by relatively modest increases in the likelihood of collision and contact occurrences that result from the temporal and spatial overlap of project marine operations with existing port marine operations.

Phase 1

Proximity of dredging operations to Navigator Terminal No. 2 Jetty and turning area

- 7.5.3 During the dredging operation, workboats (project dredging vessels) will undertake dredging of the berth pocket and Proposed Development

approaches, (see Inset 5.9 and Inset 5.10). This will result in dredging activity taking place in close proximity to where vessels bound for Navigator Terminal are manoeuvring. This leads to an increase in the likelihood of a contact or collision incident occurrence involving workboats and tankers approaching Navigator Terminal.

- 7.5.4 The likelihood of a collision hazard occurrence involving a workboat and either a tanker or cargo vessel is also increased due to an increase in workboat numbers and the proximity in which vessels of this type will operate to manoeuvring tanker and cargo vessels.

Proximity of AtoN to Proposed Development dredging area

- 7.5.5 Dredging works will take place in proximity to navigation buoy No. 21 and North Tees No. 4 Winker buoy. The proximity of the dredging works to these AtoN results in an increase in the likelihood of a contact incident. This is reflected in the Proposed Development risk assessment scoring for marine operations phase 1.

Phase 2

Encroachment of Mediterranean Moored MC Class vessel on Turning Area

- 7.5.6 It is proposed that up to 10% of the AIL deliveries during 2 of the marine operation will be offloaded with the MC class Heavy Lift Vessel (HLV) in a Mediterranean-mooring configuration. Mooring the MC class vessel in this configuration will potentially impact:
- navigation in the turning circle; and
 - turning operations of vessels transiting astern into Tees Dock.
- 7.5.7 Note, it is assumed that when moored in this arrangement, two bow anchors will be deployed. It is further assumed that these anchor chains will protrude approximately 50m from the bow of the vessel.
- 7.5.8 This results in an increase in the likelihood of a project vessel being contacted by either a tanker or cargo vessel.
- 7.5.9 Inset 5.12 demonstrates an indicative clearance of 109m to the closest point of the bow of a general cargo vessel when manoeuvring within the turning circle to go astern into Tees Dock at the same time an MC-Class vessel Mediterranean-moored at the Proposed Development berth.
- 7.5.10 Inset 5.10 shows a typical swept path of a tanker arriving at Navigator Terminal No. 2 Jetty. In this instance, the vessel moors port side to the Jetty. On the 10% of occasions when an MC-Class vessel is Med-moored during this Phase, it is unlikely that tankers will be able to approach Navigator

Terminal No.2 Jetty in the same way. This will require a deconfliction plan if there are simultaneous operations of this kind.

Phase 3

- 7.5.11 As with Phase 2, the proximity of the Proposed Development berth to Navigator Terminal results in a minor increase in the likelihood of a contact occurrence between a project vessel and a tanker moored at Navigator Terminal.

Proximity of Proposed Development berth and Navigator Terminal No. 2 Jetty

- 7.5.12 The berth pocket of the Proposed Development Site extends to 290m in length and over 50m in width which should easily accommodate a Panamax vessel of around 230m LOA when delivering biomass feedstocks to the plant. If a 186 m LOA tanker is moored on the Navigator Terminal No. 2 Jetty, there is a gap of 72.2 m between the two vessels and the space in which tugs in assistance would utilize (see Inset 5.11). Whilst there is sufficient room for vessels to moor in benign conditions, there could be challenges in adverse weather conditions.

7.6 Potential re-opening of Navigator Terminal No.1 Jetty

- 7.6.1 As described in Section 6.1.1, during engagement with Navigator Terminal they indicated that there was a future plan to re-open their No.1 Jetty which had not been used by tankers for many years.
- 7.6.2 Due to an absence of any marine concept plan for the re-establishment of Jetty No.1, it has not been possible to fully assess the potential interaction with the Proposed Development and related marine operations. To do so would require information on the proposed nature of jetty use, typical vessel type and dimensions, approximate number of annual arrivals/departures, their impact on No.2 Jetty use, and finally a timescale by which this jetty could be brought back into operational use.
- 7.6.3 However, some analysis has been undertaken to assess the maximum vessel length that potentially could be accommodated on No.1 Jetty whilst No.2 Jetty is in use. There are limitations to the maximum length of vessel which can be accommodated on this Jetty, which include:
- existing alignment of No.1 and No.2 jetties and current geometry of the Seal Sands quay;
 - riverside space limitations on the south west end of the berth pocket;
 - dredged depth of berth pocket;
 - positioning of future vessel manifold for connection to landside hoses and pipelines; and

- provision of adequate shoreside mooring infrastructure to accommodate safe mooring at both No.1 and No.2 Jetties (tankers moored alongside No.2 Jetty often make use of mooring dolphins on the redundant No.1 Jetty).

7.6.4 Analysis of AIS vessel data showed a large range of length overall of tanker vessels utilising No.2 Jetty from 80m LOA up to 186m LOA. Split into 10m ranges, the highest proportion of arrivals was 90 to 100m LOA with 50 out of 140 round trips – see Table 7.11.

Table 7.11 Round-trip tanker arrivals/departures at Navigator Terminal No.2 Jetty by LOA (m)

Tanker LOA (m) Range	No. of arrival/departures* at NT No.2 Jetty
70-80m	1
80-90m	9
90-100m	50
100-110m	5
110-120m	13
120-130m	12
130-140m	4
140-150m	31
150-160m	1
160-170m	6
170-180m	2
180-190m	6
Grand Total	140

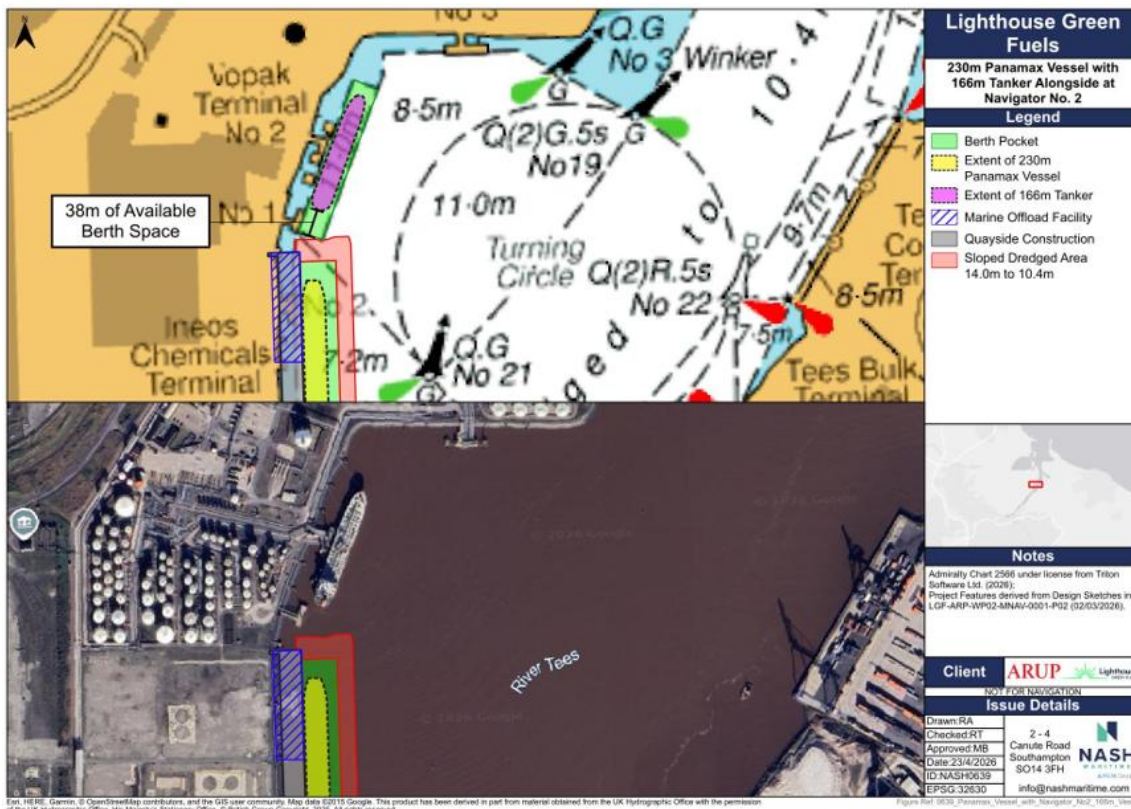
*counted as one round trip

7.6.5 Inset 7.1 shows there is 70m of available berthing space when a 100m LOA tanker is centrally moored to No.2 Jetty. PD Teesport stated that there is a mandatory requirement for a minimum 20m physical separation between two adjacent moored vessels which will reduce the available space to 50m if restricted to the existing berth pocket dimensions.

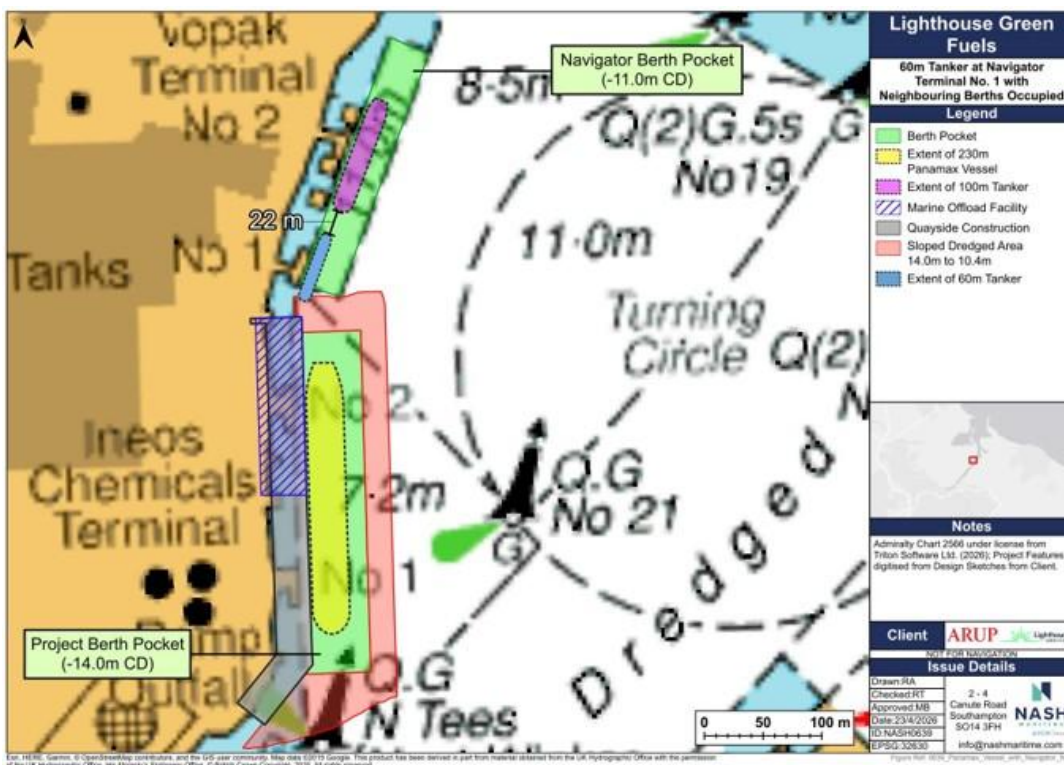


Inset 7.1 Assessment of available space with 100m LOA tanker moored on Navigator Terminal No.2 Jetty within existing berth pocket dimensions

- 7.6.6 With a 166m LOA vessel moored on Jetty No.2, this available space reduces to 38m and, taking the separation distance into account, a total of only 18m to the edge of the dredged pocket – see Inset 7.2.
- 7.6.7 If a vessel moors slightly to the south west and outside of the existing berth pocket, it is theoretically possible for a 60m LOA vessel to moor alongside when a 230m LOA Panamax vessel is moored alongside the Proposed Development berth and a 100m LOA tanker is moored alongside No.2 Jetty – see Inset 7.3. Whilst it is conceivable that some older, smaller tankers (those used on inland waterways for example) may be able to moor within the constraints described above anything larger will create a navigation risk to vessels moored alongside the Proposed Development berth and Navigator Terminals No.2 Jetty.



Inset 7.2 Assessment of available space with 166m LOA tanker moored on Navigator Terminals No.2 Jetty



Inset 7.3 Assessment of available space with 100m LOA tanker moored on Navigator Terminal No.2 Jetty outside of existing berth pocket dimensions

7.7 Project risk assessment

Phase 1

- 7.7.1 The project risk assessment considers hazard frequency and consequence in a scenario whereby the port baseline operations (as assessed in the baseline assessment of risk) continue alongside the proposed phase 1 marine operations with no additional project mitigation/risk controls in place.
- 7.7.2 The results of the project assessment of risk for the proposed phase 1 marine operations are presented in Table 7.12.
- 7.7.3 Of the 11 hazards for phase 1 marine operations:
- one hazard scored as “negligible risk”;
 - seven hazards scored as “low risk”;
 - three hazards scored as “ALARP” risk;
 - zero hazards scored as “significant risk”; and
 - zero hazards scored as “high risk”.

Table 7.12 Phase 1 Proposed Development navigation risk assessment

ID	Baseline rank	Inherent rank	Hazard title	Baseline risk	Project risk
42	3	2	Contact vessel alongside berth - Tanker	4.83	5.36
39	15	6	Collision - Tanker ICW Workboat	3.35	4.58
35	16	8	Collision - Workboat ICW Workboat	3.32	4.41
16	12	11	Collision - General Cargo Vessel ICW Workboat	3.46	3.95
38	24	24	Mooring Incident - All Vessel	2.76	2.76
10	27	27	Tug Girting	2.63	2.63
14	28	28	Contact berth - Workboat	2.58	2.58
48	38	31	Contact - Vessel with Navigation Buoy	1.83	2.50
11	35	34	Diving Incident	1.95	2.36
9	44	36	Grounding - Workboat	1.32	2.28
1	41	38	Contact vessel alongside berth - Workboat	1.53	1.93

Phase 2

7.7.4 The project risk assessment considers hazard frequency and consequence in a scenario whereby the port baseline operations (as assessed in the baseline assessment of risk) continue alongside the proposed phase 2 marine operations with no additional project mitigation/risk controls in place. The results of the project assessment of risk for the proposed phase 2 marine operations are presented in Table 7.13.

7.7.5 Of the 16 hazards for phase 2 marine operations:

- three hazards scored as “negligible risk”;
- eleven hazards scored as “low risk”;
- two hazards scored as “ALARP” risk;
- zero hazards scored as “significant risk”; and
- zero hazards scored as “high risk”.

Table 7.13 Phase 2 Proposed Development navigation risk assessment

ID	Baseline rank	Project rank	Hazard title	Baseline risk	Project risk
30	4	2	Contact vessel alongside berth - General Cargo Vessel	4.70	5.45
42	3	3	Contact vessel alongside berth - Tanker	4.83	5.36
22	19	12	Collision - Tanker ICW Project Cargo	3.26	3.68
38	24	13	Mooring Incident - All Vessel	2.76	3.51
16	12	14	Collision - General Cargo Vessel ICW Workboat	3.46	3.46
39	15	17	Collision - Tanker ICW Workboat	3.35	3.35
35	16	18	Collision - Workboat ICW Workboat	3.32	3.32
3	29	22	Collision - Workboat ICW Project Cargo	2.56	2.91
27	26	23	Collision - General Cargo Vessel ICW Project Cargo	2.65	2.88
10	27	28	Tug Girting	2.63	2.63
14	28	29	Contact berth - Workboat	2.58	2.58
25	29	30	Grounding - Project Cargo	2.56	2.56
23	39	35	Contact vessel alongside berth - Project Cargo Vessel	1.74	2.08
34	40	40	Contact berth - Project Cargo Vessel	1.64	1.64
1	41	41	Contact vessel alongside berth - Workboat	1.53	1.53

ID	Baseline rank	Project rank	Hazard title	Baseline risk	Project risk
9	44	44	Grounding - Workboat	1.32	1.32

Phase 3

- 7.7.6 The project risk assessment considers hazard frequency and consequence in a scenario whereby the port baseline operations (as assessed in the baseline assessment of risk) continue alongside the proposed phase 3 marine operations with no additional project mitigation/risk controls in place.
- 7.7.7 The results of the project assessment of risk for the proposed phase 3 marine operations are presented in Table 7.14.
- 7.7.8 Of the 16 hazards for phase 3 marine operations:
- four hazards scored as “negligible risk”;
 - 10 hazards scored as “low risk”;
 - two hazards scored as “ALARP” risk;
 - zero hazards scored as “significant risk”; and
 - zero hazards scored as “high risk”.

Table 7.14 Phase 3 Proposed Development navigation risk assessment

ID	Baseline rank	Inherent rank	Hazard title	Baseline risk	Project risk
42	3	2	Contact vessel alongside berth - Tanker	4.83	5.36
30	4	4	Contact vessel alongside berth - General Cargo Vessel	4.70	4.70
39	15	6	Collision - Tanker ICW Workboat	3.35	3.35
35	16	8	Collision - Workboat ICW Workboat	3.32	3.32
16	12	11	Collision - General Cargo Vessel ICW Workboat	3.46	3.46
22	19	19	Collision - Tanker ICW Project Cargo	3.26	3.26
38	24	24	Mooring Incident - All Vessel	2.76	2.76
27	26	26	Collision - General Cargo Vessel ICW Project Cargo	2.65	2.88
10	27	27	Tug Girting	2.63	2.63
14	28	28	Contact berth - Workboat	2.58	2.58

ID	Baseline rank	Inherent rank	Hazard title	Baseline risk	Project risk
3	29	29	Collision - Workboat ICW Project Cargo	2.56	2.56
25	29	29	Grounding - Project Cargo	2.56	2.56
9	44	36	Grounding - Workboat	1.32	1.32
1	41	38	Contact vessel alongside berth - Workboat	1.53	1.53
23	39	41	Contact vessel alongside berth - Project Cargo Vessel	1.74	1.74
34	40	42	Contact berth - Project Cargo Vessel	1.64	1.64

7.8 Additional risk controls

- 7.8.1 Following the Proposed Development assessment of navigation risk, additional risk controls were developed that are designed to specifically address the navigation issues identified in Section 7.5.
- 7.8.2 The identified risk controls are summarised in Table 7.15 along with the key navigational issues that the control measures are designed to mitigate. The table also highlights the applicability of each of the additional risk controls to each marine operation phase.

Table 7.15 Summary of additional risk controls

ID	Title	Detail	Phase 1	Phase 2	Phase 3
1	Deconfliction	Phase 1 Deconfliction of Workboats and other vessels during this phase will need careful management. PDT VTS should be provided with a detailed dredging programme and dredging activity in proximity to the Navigator Terminal and the turning circle should be avoided during Tanker vessel arrivals and departures whilst general cargo vessels are manoeuvring. Standard Operating Procedures should be developed to ensure deconfliction of vessel movements in this scenario and weekly meetings between the dredge contractor, PDT, Tees Dock and Navigator Terminals should take place to ensure effective coordination. Phase 2 The Proposed Development is currently planning for the arrival of approximately 200 AIL deliveries over an 18-month period, this will result in an approximate 50% increase in large vessel movements over one hour either side of	Yes	Yes	Yes

ID	Title	Detail	Phase 1	Phase 2	Phase 3
		high water. Deconfliction with other operations in the area, including Navigator Terminals and Tees Dock will be essential to minimising navigation risk. The deconfliction plan should also consider availability of pilotage and towage resources. It will be the responsibility of the Applicant to ensure the plan is agreed with other terminals and the Harbour Master on a weekly basis. Phase 3 Deconfliction of vessel arrivals and departures at Terminals within the study area and at the Proposed Development terminal through greater management of vessel departures and arrivals to minimise conflicts.			
2	Relocation of existing AtoN	Dredging works will take place in proximity to navigation buoy No. 21 and North Tees No. 4 Winker buoy. North Tees No. 4 Winker buoy will need to be temporarily relocated during the dredging works whilst Buoy No. 21 will be removed permanently. Any relocation or removal of AtoN should be promulgated to port users via NtM and nautical charts updated accordingly.	Yes	No	No
3	Approval of mooring configuration	Project vessels will be permitted to moor alongside the Proposed Development site without seeking permission from the Harbour Master. Although, permission to Med moor will be solely subject to the Harbour Master's prior approval. Applications for Med mooring should only be considered if accompanied by a detailed plan for deconfliction with other operators (Risk Control 1 (Phase 2)) and a detailed berthing plan (Risk Control 4).	No	Yes	No
4	Berthing Plans	Berthing plans should be submitted to the Harbour Master for approval and should be adapted as necessary for all envisaged berthing scenarios and offload operations. Berthing plans should define suitable operational restrictions to ensure that berthing and offload operations do not take place during adverse weather.	No	Yes	No

7.8.3 The additional risk control measures were applied to each hazard to mitigate the key navigational issues and corresponding increases in navigation risk that result from the proposed marine operation phases.

7.8.4 The additional risk controls applied to hazards associated with the Phase 1 marine operation in Table 7.16.

- 7.8.5 The additional risk controls applied to hazards associated with the Phase 2 marine operation are summarised in Table 7.17.
- 7.8.6 The additional risk controls applied to hazards associated with the Phase 3 marine operation are summarised in Table 7.18.

Table 7.16 Application of additional risk controls, Phase 1

ID	Hazard title	Deconfliction	Relocation of existing AtoN	Approval of mooring configuration	Berthing plans
42	Contact vessel alongside berth - Tanker				
39	Collision - Tanker ICW Workboat				
35	Collision - Workboat ICW Workboat				
16	Collision - General Cargo Vessel ICW Workboat				
38	Mooring Incident - All Vessel				
10	Tug Girting				
14	Contact berth - Workboat				
48	Contact - Vessel with Navigation Buoy				
11	Diving Incident				
9	Grounding - Workboat				
1	Contact vessel alongside berth - Workboat				

Table 7.17 Application of additional risk controls, Phase 2

ID	Hazard Title	Deconfliction	Relocation of existing AtoN	Approval of mooring configuration	Berthing plans
30	Contact vessel alongside berth - General Cargo Vessel				
42	Contact vessel alongside berth - Tanker				
22	Collision - Tanker ICW Project Cargo				
38	Mooring Incident - All Vessel				
16	Collision - General Cargo Vessel ICW Workboat				
39	Collision - Tanker ICW Workboat				
35	Collision - Workboat ICW Workboat				
3	Collision - Workboat ICW Project Cargo				
27	Collision - General Cargo Vessel ICW Project Cargo				
10	Tug Girting				
14	Contact berth - Workboat				
25	Grounding - Project Cargo				
23	Contact vessel alongside berth - Project Cargo Vessel				
34	Contact berth - Project Cargo Vessel				
1	Contact vessel alongside berth - Workboat				
9	Grounding - Workboat				

Table 7.18 Application of additional risk controls, Phase 3

ID	Hazard Title	Deconfliction	Relocation of existing AtoN	Approval of mooring configuration	Berthing Plans
42	Contact vessel alongside berth - Tanker				
30	Contact vessel alongside berth - General Cargo Vessel				
39	Collision - Tanker ICW Workboat				
35	Collision - Workboat ICW Workboat				
16	Collision - General Cargo Vessel ICW Workboat				
22	Collision - Tanker ICW Project Cargo				
38	Mooring Incident - All Vessel				
27	Collision - General Cargo Vessel ICW Project Cargo				
10	Tug Girting				
14	Contact berth - Workboat				
3	Collision - Workboat ICW Project Cargo				
25	Grounding - Project Cargo				
9	Grounding - Workboat				
1	Contact vessel alongside berth - Workboat				
23	Contact vessel alongside berth - Project Cargo Vessel				
34	Contact berth - Project Cargo Vessel				

7.9 Residual risk assessment

Phase 1

- 7.9.1 Following the identification and application of risk controls measures to the project hazards a residual assessment of risk was undertaken to determine the effectiveness of the additional risk control measures developed.
- 7.9.2 The results of the residual assessment of risk for the Phase 1 marine operation are presented in Table 7.19
- 7.9.3 The residual assessment of risk resulted in:
- two hazards scoring as “negligible risk”;
 - six hazards scoring as “low risk”;
 - three hazards scoring as “ALARP” risk;
 - zero hazards scoring as “significant risk”; and
 - zero hazards scoring as “high risk”.

Table 7.19 Residual risk assessment, Phase 1

ID	Baseline rank	Inherent rank	Residual rank	Hazard title	Baseline risk	Project risk	Residual risk
42	3	2	3	Contact vessel alongside berth – Tanker	4.83	5.36	4.83
35	16	8	7	Collision - Workboat ICW Workboat	3.32	4.41	4.41
39	15	6	9	Collision - Tanker ICW Workboat	3.35	4.58	4.10
16	12	11	14	Collision - General Cargo Vessel ICW Workboat	3.46	3.95	3.46
38	24	24	24	Mooring Incident - All Vessel	2.76	2.76	2.76
10	27	27	27	Tug Girting	2.63	2.63	2.63
14	28	28	28	Contact berth - Workboat	2.58	2.58	2.58
11	35	34	33	Diving Incident	1.95	2.36	2.36
9	44	36	35	Grounding - Workboat	1.32	2.28	2.28
1	41	38	37	Contact vessel alongside berth - Workboat	1.53	1.93	1.93
48	38	31	43	Contact - Vessel with Navigation Buoy	1.83	2.50	1.43

Phase 2

- 7.9.4 Following the identification and application of risk controls measures to the Proposed Development's navigational hazards, a residual assessment of risk was undertaken to determine the effectiveness of the additional risk control measures developed.
- 7.9.5 The results of the residual assessment of risk for the Phase 2 marine operation are presented in Table 7.20. The residual assessment of risk resulted in:
- four hazards scoring as “negligible risk”;
 - ten hazards scoring as “low risk”;
 - two hazards scoring as “ALARP” risk;
 - zero hazards scoring as “significant risk”; and
 - zero hazards scoring as “high risk”.

Table 7.20 Residual risk assessment, Phase 2

ID	Baseline rank	Project rank	Residual rank	Hazard title	Baseline risk	Project risk	Residual risk
42	3	3	3	Contact vessel alongside berth - Tanker	4.83	5.36	4.83
30	4	2	4	Contact vessel alongside berth - General Cargo Vessel	4.70	5.45	4.70
16	12	14	12	Collision - General Cargo Vessel ICW Workboat	3.46	3.46	3.46
39	15	17	15	Collision - Tanker ICW Workboat	3.35	3.35	3.35
35	16	18	16	Collision - Workboat ICW Workboat	3.32	3.32	3.32
22	19	12	19	Collision - Tanker ICW Project Cargo	3.26	3.68	3.26
38	24	13	24	Mooring Incident - All Vessel	2.76	3.51	2.76
27	26	23	26	Collision - General Cargo Vessel ICW Project Cargo	2.65	2.88	2.65
10	27	28	27	Tug Girting	2.63	2.63	2.63
14	28	29	28	Contact berth - Workboat	2.58	2.58	2.58
3	29	22	29	Collision - Workboat ICW Project Cargo	2.56	2.91	2.56
25	29	30	29	Grounding - Project Cargo	2.56	2.56	2.56
23	39	35	39	Contact vessel alongside berth - Project Cargo Vessel	1.74	2.08	1.74
34	40	40	40	Contact berth - Project Cargo Vessel	1.64	1.64	1.64
1	41	41	41	Contact vessel alongside berth - Workboat	1.53	1.53	1.53
9	44	44	44	Grounding - Workboat	1.32	1.32	1.32

Phase 3

- 7.9.6 Following the identification and application of risk controls measures to the Project hazards a residual assessment of risk was undertaken to determine the effectiveness of the additional risk control measures developed.
- 7.9.7 The results of the residual assessment of risk for the Phase 3 marine operation are presented in Table 7.21. The residual assessment of risk resulted in:
- four hazards scoring as “negligible risk”;
 - ten hazards scoring as “low risk”;
 - two hazards scoring as “ALARP” risk;
 - zero hazards scoring as “significant risk”; and
 - zero hazards scoring as “high risk”.
- 7.9.8 The application of the additional risk controls results reduced several hazard risk scores in the residual assessment of risk. In general, this showed that contact and collisions hazards remain at similar levels in the residual risk when compared to the baseline risk.
- 7.9.9 Minimal increases in navigation risk between the baseline and project risk assessments are noted for tanker, cargo and project vessels. These increases are driven by relatively modest increases in the likelihood of collision and contact occurrences that result from the temporal and spatial overlap of project marine operations with exiting port marine operations.
- 7.9.10 Despite this, the application of the additional risk control measures, aimed at deconflicting the project marine operations and existing port marine operations reduced all hazards within the Proposed Development to ALARP or below. As proportionate risk control measures have been introduced it is concluded that navigation risk associated with the three marine operations phases can be reduced to Tolerable levels.

Table 7.21 Residual risk assessment, Phase 3

ID	Baseline rank	Inherent rank	Residual rank	Hazard title	Baseline risk	Inherent risk	Residual risk
42	3	2	3	Contact vessel alongside berth - Tanker	4.83	5.36	4.83
30	4	4	4	Contact vessel alongside berth - General Cargo Vessel	4.70	4.70	4.70
35	16	8	7	Collision - Workboat ICW Workboat	3.32	3.32	3.32
39	15	6	9	Collision - Tanker ICW Workboat	3.35	3.35	3.35
16	12	11	14	Collision - General Cargo Vessel ICW Workboat	3.46	3.46	3.46
22	19	19	19	Collision - Tanker ICW Project Cargo	3.26	3.26	3.26
38	24	24	24	Mooring Incident - All Vessel	2.76	2.76	2.76
27	26	26	26	Collision - General Cargo Vessel ICW Project Cargo	2.65	2.88	2.65
10	27	27	27	Tug Girting	2.63	2.63	2.63
14	28	28	28	Contact berth - Workboat	2.58	2.58	2.58
3	29	29	29	Collision - Workboat ICW Project Cargo	2.56	2.56	2.56
25	29	29	29	Grounding - Project Cargo	2.56	2.56	2.56
9	44	36	35	Grounding - Workboat	1.32	1.32	1.32
1	41	38	37	Contact vessel alongside berth - Workboat	1.53	1.53	1.53
23	39	41	40	Contact vessel alongside berth - Project Cargo Vessel	1.74	1.74	1.74
34	40	42	41	Contact berth - Project Cargo Vessel	1.64	1.64	1.64

8 NRA findings

8.1 Conclusions

- 8.1.1 The study findings include the conclusions of the assessment and the recommendations requiring action. They are based on the structured assessment methodology, and the results of the assessment from the three marine operation phases. They therefore consider the baseline navigation characterisation, vessel traffic analysis, stakeholder consultation and expert opinion of the project team.
- 8.1.2 The scope of the NRA was to assess navigation risk associated with the Proposed Development's marine operations.
- 8.1.3 The NRA assessed three risk assessment scenarios associated with the following phases of the Proposed Development marine operation:
- Phase 1: Construction of the quay (and demolition of the existing infrastructure) and dredging of the berth pocket and access channel.
 - Phase 2: Marine operations during the construction of the rest of the Proposed Development; and,
 - Phase 3: Marine operations during the operational phase of the facility (the import of biomass and waste wood via the quay).
- 8.1.4 To inform the NRA the project team undertook:
- a review of the proposed marine operations;
 - a study of the baseline navigational environmental including port legislation, guidance, management, usage and key navigational features;
 - detailed vessel traffic analysis to understand spatial and temporal movements of vessels of differing types within the study area; and
 - thorough stakeholder engagement to elicit local stakeholder and regulatory expert opinion.
- 8.1.5 The results of the baseline risk assessment, which adopted the Teesport Port Wide Risk Assessment is summarised in Table 8.1.
- 8.1.6 Following the project assessment of risk, key navigational issues were identified and analysed with a view to identifying and designing risk control measures to address the issues and reduce navigational risk arising from the Proposed Development marine operations.

8.1.7 Four additional risk controls were identified and applied to individual hazards to reduce navigation risk.

- deconfliction;
- relocation of existing AtoN;
- approval of mooring configuration; and
- berthing plans.

Table 8.1 Baseline risk result summary

		Risk level				
Project Phase	No. of relevant hazards	Negligible risk	Low risk	ALARP	Significant risk	High risk
		No. of Hazards scored within each risk category				
Phase 1	11	1	7	3	0	0
Phase 2	16	3	11	2	0	0
Phase 3	16	4	10	2	0	0

8.1.8 Following the identification and application of risk controls measures to the project hazards a residual assessment of risk was undertaken to determine the effectiveness of the additional risk control measures developed.

8.1.9 The results of the residual risk assessment (with additional risk controls in place) are shown in Table 8.2.

Table 8.2 Residual risk results summary

		Risk Level				
Project Phase	No. of relevant hazards	Negligible risk	Low risk	ALARP	Significant risk	High risk
Phase 1	11	2	6	3	0	0
Phase 2	16	4	10	2	0	0
Phase 3	16	4	10	2	0	0

- 8.1.10 The application of the additional risk controls results in reductions in hazard risk scores in the residual assessment of risk. In general, contact and collisions risks remain at similar levels in the residual risk when compared to the baseline risk.
- 8.1.11 Minimal increases in navigation risk between the baseline and project risk assessments are noted for tanker, cargo and project vessels. These increases are driven by relatively modest increases in the likelihood of collision and contact occurrences that result from the temporal and spatial overlap of project marine operations with exiting port marine operations.
- 8.1.12 Despite this, the application of the additional risk control measures, aimed at deconflicting the project marine operations and existing port marine operations reduced all hazards at both sites to ALARP or below. As proportionate risk control measures have been introduced it is concluded that navigation risk associated with the three marine operations phases can be reduced to Tolerable levels.

8.2 Recommendations

- 8.2.1 The NRA recommends that the Proposed Development should adopt and implement the four identified risk control measures before commencing any marine operations.

References

- Ref 1 Department for Transport (2025) Ports and Marine Facilities Safety Code (PMSC). Available online: <https://assets.publishing.service.gov.uk/media/67fd175bed87b81608546666/port-marine-safety-code.pdf> [Accessed June 2026]
- Ref 2 UK Parliament (1966) Tees and Hartlepool Port Authority Act. Available online: <https://www.legislation.gov.uk/ukla/1966/25/contents/enacted> [Accessed June 2026]
- Ref 3 PD Ports (2025) Pilotage Direction. Available online: <https://www.pdports.co.uk/wp-content/uploads/2025/10/Pilotage-Direction-2025.pdf> [Accessed June 2026]
- Ref 4 PDT Limited (2022) Harbour Master Tees and Hartlepool Navigational Risk Assessment Review, Marico Marine (22UK1888).
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- Ref 6 PD Ports (2021) General Directions for Safety of Navigation, Persons and Property in the Harbour. Available online: <https://www.pdports.co.uk/wp-content/uploads/2024/06/General-Directions-final-version-15.01.20-1.pdf> [Accessed June 2026]
- Ref 7 Copernicus Marine Data Store. Available online: <https://data.marine.copernicus.eu/products> [Accessed June 2026].
- Ref 8 International Maritime Organisation (2018) Revised Guidelines for Formal Safety Assessment 2018. Available online: [https://wwwcdn.imo.org/localresources/en/OurWork/HumanElement/Documents/MSC-MEPC.2-Circ.12-Rev.2%20-%20Revised%20Guidelines%20For%20Formal%20Safety%20Assessment%20\(Fsa\)For%20Use%20In%20The%20Imo%20Rule-Making%20Proces...%20\(Secretariat\).pdf](https://wwwcdn.imo.org/localresources/en/OurWork/HumanElement/Documents/MSC-MEPC.2-Circ.12-Rev.2%20-%20Revised%20Guidelines%20For%20Formal%20Safety%20Assessment%20(Fsa)For%20Use%20In%20The%20Imo%20Rule-Making%20Proces...%20(Secretariat).pdf) [Accessed June 2026]

Annex A Kick-off meeting minutes

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 03-Oct-2025

LIGHTHOUSE GREEN FUELS NRA

Project Title	Lighthouse Green Fuels-NRA
Project Number	0639
Meeting subject / purpose	Kick Off Meeting
Revision	R01-00
Date of meeting	03-Oct-25
Start time	11.30am
Finish time	12.30am
Client	Arup / Alfanar
Location	Via MS Teams

DOCUMENT CONTROL

Revision	Date of Issue	Description	Approved
R01-00	03-Oct-25	Notes of meeting	SAB

ATTENDEES

Organisation	Attendee	Role	Initial
Arup		Maritime Project Director	CB
		Senior Consultant	CB
PD Ports		Harbour Master	PB
Alfanar		Development Manager (Project DCO)	JR
NASH Maritime		Associate Director – Ports & Harbours Team (Project Director)	SAB
		Principal Consultant – Marine Infrastructure (Project Manager)	MB
		Senior Maritime Consultant (Technical Lead)	AD
		Maritime Consultant (GIS & Data Analyst Lead)	MJP

AGENDA

- Introductions.
- Meeting purpose.
- Review NRA scope.
- NRA Study Area.
- NRA methodology.
- Data requirements.

Meeting Minutes | 03/10/25

1

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 03-Oct-2025

NOTES OF MEETING

1	Introductions / Meeting Purpose	Action
	Project introduction and establish NRA scope, risk assessment methodology, identify project input and data, confirm key engagement and interaction with PD port.	
	PB stated that CS, former Deputy Harbour Master at PD Ports, had moved to a new role, but he will introduce his replacement to the project team in due course.	PB
2	NRA Scope	
	All agreed to the three scenarios of assessment described by SAB: i. Construction of the project berth and dredging of the berth pocket. ii. Marine operation during the construction of the Lighthouse Green Fuels plant. iii. Marine operation during the operational phase of the project (assumed to be the import of biomass materials to the project berth).	
	Where some details of the project have not been confirmed a cautious 'worst case' approach will be adopted (e.g. construction methodology, use of Panamax vessel).	
	PB agreed that any stakeholder engagement is to focus on marine users only (i.e. not emergency planning forums whose broader comments will be picked up through the DCO process).	
3	Study Area	
	SAB showed an indicative study area. It was assumed that activity outside the indicative study area would be covered under normal port operational procedures hence the NRA will focus on the turning area and the terminal. PB agreed, anything beyond the study area is covered under normal marine operations. He noted that the port already welcomes Panamax-size vessels which is covered by their port wide risk assessment.	
	PB noted the background chart used on the graphic was out of date. He indicated that the turning circle has been dredged to 11m and the port has new nautical charts which he potentially could supply to NASH.	
	On the issue of depth, JR noted that Alfanar's potential choice of Panamax vessels is on the basis of volume rather than weight, hence the vessel will not be navigating fully loaded.	
4	NRA Methodology	
	SAB outlined the two different approaches which could be taken to the NRA methodology. PB confirmed that he would be content with using the port's existing baseline risk assessment and pre-agreed hazards, vessel type categories, etc. He noted that as the port already welcomes the intended size of vessel to those proposed for this project, it will not cause them issues from a risk management perspective.	
5	Data Requirements	
	Supply of most recent port-wide risk assessment: PB confirmed that the most recent comprehensive PWRA was produced in 2022, but the version is reviewed every 6 months. PB agreed to provide updated risk tables and hazard logs to NASH.	PB
	AIS Data: PB confirmed he can provide one year of AIS data from September 2024 to September 2025.	PB
	Nautical Chart: PB will assess if can share new chart. If not, NASH will purchase. SAB noted that latest bathymetry data will be taken from this chart.	PB / MJP

Meeting Minutes | 03/10/25

2

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 03-Oct-2025

	Incident data: PB to share latest data with NASH.	PB
	Construction methodology: CB stated that the deck construction design is not finalised: Three types of deck are being analysed. All agreed that the NRA assess the construction with the greatest impact on navigation, especially encroachment into the turning circle, and with the greatest number of vessel movements involved in construction. It was agreed that the suspended deck would be chosen as the realistic worst-case scenario. CB to provide latest design on suspended deck.	CB
	NASH to refine the assumption for each scenario in terms of vessel types and worst case and circulated draft for comment w/c 6-Oct.	AD/MB
	JR pointed out that a portion of the smaller barges could chose to adopt a med mooring position, although there is still room to do this without encroaching into the turning circle. JD will update the Marine Concept Plan and issue towards the end of w/c 6-Oct-25 and issue to NASH.	JR
	A point was raised as to whether there may be an objection raised by the adjacent operator, Navigator, in terms of encroachment into their berth/quayside. PB stated that their No.1 Jetty does not get used so should not provide any conflict in interaction. JR confirmed that they are already in discussion with Navigator and will work through any comments that they have outside of the NRA project.	
	Assumptions formed to date: <u>Use of vessels</u> JR noted consideration needs to be made relating to traffic numbers within the operational phase as there is a wide range of proposed vessel types, from coaster to Panamax (worst case for navigation). Coasters will most likely be used for the transport of UK products and Panamax for wood pellets. In a realistic worst-case scenario, the Panamax is the largest vessel, however they would not transit as frequently as Coasters (which are smaller and likely number of deliveries will be greater). The project may also use smaller vessels in the initial operational phases, and larger vessels later. During the analysis, SAB suggests taking the largest vessels' movements and medium vessels' frequency of movements. To ensure that the NRA scope covers both vessel frequency and size, the frequency of medium-sized vessels (likely to be Handimax) would be applied to the Panamax vessels during our assessment. Liquid bulk export: not included in the study as it will be carried out via a third party and will be part of the port's business-as-usual activity. Module size: maximum size is currently unknown which may be an issue if it makes the vessel wider. SAB confirms that NASH will assume the largest vessel with the largest AIL component. JR: As the site changed location, it gave the Alfanar the opportunity to have bigger modules, though these are not yet confirmed as they're still in draft. SAB stresses that we need more information on construction methodology. <u>Other matters:</u> Time on berth was questioned, although it should not be an issue as long as the vessel does not constitute an obstruction to navigation whilst at the berth.	
	Programme The delivery programme for the NRA is agreed as 8 weeks from contract signing 29-Sept-25. JR will supply any furth update on the DCO project programme.	JR

Meeting Minutes | 03/10/25

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Annex B Notes from meeting with Tees Bay Pilot held on 13 November 2025

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 13-Nov-2025



LIGHTHOUSE GREEN FUELS NRA

Project Title	Lighthouse Green Fuels-NRA
Project Number	0639
Meeting subject / purpose	Engagement Meeting with Tees Bay Pilots
Revision	R01-00
Date of meeting	13-Nov-25
Start time	14.00hrs
Finish time	15.30hrs
Client	Arup / Alfanar
Location	Via MS Teams

DOCUMENT CONTROL

Revision	Date of Issue	Description	Approved
R01-00	28-Nov-25	Notes of meeting	SAB

ATTENDEES

Organisation	Attendee	Role	Initial
Tees Bay Pilots		Pilot	JP
NASH Maritime		Associate Director – Ports & Harbours Team (Project Director)	SAB
		Principal Consultant – Marine Infrastructure (Project Manager)	MB
		Senior Maritime Consultant	AD

AGENDA

- Introductions.
- Meeting purpose.
- Review NRA scope and study area
- Anticipated project vessels
- Maritime activity.
- Discussions

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 13-Nov-2025

NOTES OF MEETING

1	Introductions / Meeting Purpose / Review NRA scope and study area	Action
	Project introduction and presentation of the NRA scope, risk assessment methodology, NRA study area.	
2	Anticipated project vessels	
	JP questioned the time frame of each phase and the potential number of transits. Post meeting note: the client has indicated that works would start Q1 2028 at the earliest.	
	JP indicated that the port currently restricts vessels over 200m LOA from passing a similar sized vessel within the authorised channel, therefore deconfliction of Proposed Scheme vessel transits with third party transits will actively be managed by VTS.	
	The Mediterranean mooring position of an MC-class vessel was discussed and its proximity to both the turning circle and authorised channel. On review, JP considered this to pose no additional risk to current port operations.	
	JP reported that the placement of the Buoy 21 should be discussed with the port. After dredging operation, Bouy 21 might not be relevant anymore and could be removed. The removal of Buoy 21 will not have an impact on the pilot's activity.	
	Regarding liquid bulk exports, JP confirmed that cargo export via tanker could be considered as business as usual and it was his belief that there was no requirement to consider this phase of the marine operation in the pNRA.	
3	Maritime activity	
	JP confirmed that Navigator Terminal No.1 Jetty has not been used in 20 years.	
	JP confirmed that tug and service vessels transits to/from No.1 jetty are not related to Navigator operations.	
	JP confirmed that fishing and recreational vessels activity are minimal.	
	JP confirmed that Navigator Terminal No.2 Jetty is frequently used, although the typical tanker is 90m to 100m LOA and therefore the pNRA analysis considers a worst case scenario.	
4	Discussion / conclusion	
	JP concluded that the only potential hazard identified was during the berthing operation of tanker at Navigator Terminal No.2 Jetty when there is a Panamax vessel alongside the proposed new quayside. JP will discuss this issue with his colleagues and come back to NASH. Post meeting note: JP responded to MB via email on 14-Nov-25 saying that the drawings had been further reviewed with colleagues and that overall, all operations would be achievable at both terminals.	JP
	JP advised NASH to discuss with Navigator terminal.	SAB/MB
	JP advised to discuss the position of Buoy #21 with the Teesport Harbour Master.	SAB/MB

Annex C Notes from meeting with Tees Port Marine Service contractors held on 14 November 2025

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 14-Nov-2025



LIGHTHOUSE GREEN FUELS NRA

Project Title	Lighthouse Green Fuels-NRA
Project Number	0639
Meeting subject / purpose	Engagement Meeting with Boluda Towage, Svitzer Marine, Foyboatmen
Revision	R01-00
Date of meeting	14-Nov-25
Start time	14.00hrs
Finish time	15.30hrs
Client	Arup / Alfanar
Location	Via MS Teams

DOCUMENT CONTROL

Revision	Date of Issue	Description	Approved
R01-00	28-Nov-25	Notes of meeting	SAB

ATTENDEES

Organisation	Attendee	Role	Initial
Arup		Senior Consultant / Project Manager	CB
Alfanar		Development Manager (Project DCO)	JR
PD Ports		Deputy Harbour Master	LO
Boluda Towage		Master / Port Captain – Towage Services	DN
Tees Licensed Foyboatmen's Association Ltd		Mooring services	LS
Svitzer Marine		Master - Towage Services	SH
NASH Maritime		Associate Director – Ports & Harbours Team (Project Director)	SAB
NASH Maritime		Principal Consultant – Ports & Harbours Team (Project Manager)	MB
NASH Maritime		Senior Maritime Consultant	AD

AGENDA

- Introductions
- Meeting purpose
- Review NRA scope and study area
- Anticipated project vessels
- Maritime activity
- Discussion

Meeting Minutes | 14/11/25

1

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 14-Nov-2025

NOTES OF MEETING

1	Introductions / Meeting Purpose / Review NRA scope and study area	Action
	Project introduction and presentation of the NRA scope, risk assessment methodology and NRA study area.	
2	Anticipated project vessels	
	DN raised the question of marine service availability during high tides. SAB indicated that it is likely that private towage contractors will be used during Phase 1 though port towage providers are likely to be used for other phases.	
3	Maritime activity	
	LO confirmed that fishing vessels transiting within the study area come to port for maintenance purposes only.	
	Discussion regarding marking and anchoring of the MC-class vessels when Mediterranean- moored. DN questioned whether the plan was to have pre-set anchors to aid mooring or whether the vessels' anchors would be deployed on each visit. If the former, pre-assigned mooring buoys with a chain at the bottom may encroach into the turning circle/navigational channel. PD Ports agreed to review once there is more certainty known on types of vessel and delivery numbers, though LO noted currently no more than 10% vessels delivering Abnormal Indivisible Loads (AILs) are forecasted to use this mooring arrangement and the permanent installation of mooring buoys would constitute a contact hazard within the turning circle.	
	Participants assessed that encroachment of an MC-class vessel, moored in a Mediterranean configuration, and the turning circle presented a minimal navigation risk because vessels transiting to Tees Dock will swing well to the east of the limit of the turning circle.	
	Participants also assessed that there was adequate navigational width for a Panamax size vessel to safely manoeuvre on to the Proposed Scheme berth when a large tanker is moored alongside Navigator Jetty No. 2.	
4	Discussion / conclusion	
	DN identified that when the dredger is in operation, it would preferably be positioned within the outlined berth pocket area dredging within, as opposed to being positioned outside the pocket dredging in (thereby utilising more river and creating a greater navigational risk). LO commented that dredge operations would likely need to be paused whilst vessel bound for Navigator Jetty No. 2 were arriving / departing.	
	LS raised the issue of the existing infrastructure on the former INEOS jetties/infrastructure to be assessed prior to any planned mooring operations. He recalled that there is extensive overgrown vegetation, the walkways may not be clear and that bollards may not be fit-for-purpose to secure vessels. LO agreed that a site visit should be carried out to assess conditions. JR indicated that such preliminary inspection should be included in the NRA.	
	SH questioned the timeframe of each phase and the potential number of transits. JR stated that, subject to DCO approval (targeted to be at the end of 2027), project commencement is expected in earnest to be in Q1 2028, although some advance site preparation works may be permitted in Q3 2027.	

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Annex D Notes from meeting with PD Teesport held on 17 November 2025

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 28-Nov-2025



LIGHTHOUSE GREEN FUELS NRA

Project Title	Lighthouse Green Fuels-NRA
Project Number	0639
Meeting subject / purpose	PD Ports.
Revision	R01-00
Date of meeting	17-Nov-25
Start time	13.00hrs
Finish time	15.00hrs
Client	Arup / Alfamar
Location	Via MS Teams

DOCUMENT CONTROL

Revision	Date of Issue	Description	Approved
R01-00	28-Nov-25	Notes of meeting	SAB

ATTENDEES

Organisation	Attendee	Role	Initial
Arup		Senior Consultant / Project Manager	CB
PD Port		Harbour Master	PB
PD Port		Deputy Harbour Master	LO
NASH Maritime		Associate Director – Ports & Harbours Team (Project Director)	SAB
NASH Maritime		Principal Consultant – Ports & Harbours Team (Project Manager)	MB
NASH Maritime		Senior Maritime Consultant	AD
NASH Maritime		GIS analyst	MJP

AGENDA

- Introductions
- Session objectives
- pNRA scope, approach, methodology and previously agreed parameters
- Overview of project phases
- Baseline characterisation
- Maritime incidents
- Key navigational impacts review and
- Hazard identification
- Discussion

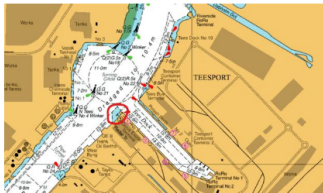
Meeting Minutes | 17/11/25

1

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 28-Nov-2025



NOTES OF MEETING

1	Introductions / Meeting Purpose / Review NRA scope and study area	Action
	Project introduction and presentation of the NRA scope, risk assessment methodology and the NRA study area.	
	PB confirmed that Proposed Scheme export activities during the operational phase will be qualified as "business as usual" as there are three terminals in close proximity to the proposed scheme site which could handle the export.	
	PB and LO clarified the names and use of Tees Dock terminals/jetties.	
	MB tabled an indicative scheme layout. CB confirmed that the dredging activity will extend to Buoy #21 and that the approach to the berth pocket (where it meets the deeper dredged depth of the turning circle will be dredged to between -10.4m to -11.0m CD.	
2	Anticipated project vessels	
	CB confirmed that there is currently no available information regarding the provenance and destination of barges outside the pNRA Study Area during the construction phase.	
3	Maritime activity	
	PB confirmed that there is minimal recreational vessel activity in the Study Area and the only fishing vessels transiting within the area are undergoing maintenance. PB agreed that these two vessel types should be scoped out of the risk assessment.	
	PB and LO identified the pilot cutters berthing area, which is within the blue shaded box on the Admiralty Chart 2566-1-A in the main part of the river Tees, to the south-west of Tees Dock (shown circled red below).  It was agreed that Tees Dock marine traffic will therefore be adjusted to exclude pilot boats.	
	PB indicated that the passenger vessels are in fact RoRo vessels with less than 12 lorry drivers on board and no other passengers. PB advises therefore that these vessels should be classified as cargo vessels when undertaking the pNRA.	
	PB indicated that during the Phase 1 dredging activity, a dredging schedule with specific time frames should be established to avoid conflict with Navigator Terminals. Such deconfliction is not part of the standard Teesport operating procedure but they can arrange a discussion between stakeholders and produce a project-specific marine co-ordination plan.	
	PB and LO confirmed that after the dredging operation Buoy 21 would no longer serve a purpose and could therefore be removed. Buoy 4 may have to be removed or relocated temporarily during dredging operations and will be reinstated once the phase is finished. A Notice to Mariners will be issued in advance.	

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Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00 – 28-Nov-2025



	PB indicated that anchor encroachment when MC-class vessels are Mediterranean-moored presents minimal navigational risk and PB noted that the swept path of <i>Hermine</i> represented a worst-case scenario manoeuvre.	
	PB indicated, based on previous activity while the INEOS site was active, that there is unlikely to be any impact on Navigator No.2 Jetty even if a Panamax is berthed at the proposed scheme site. He believed clearance distances are sufficient enough for the two operations to co-exist without interference or conflict.	
	PB indicated that it is unlikely that there will be any congestion of navigation during high water. Historically, the Port may have struggled when there were only two tugs available. However, the Port now has two towage operators with four tugs each and there are fewer vessels needing this service now. PB indicates that they could provide additional tugs if necessary.	
	In summary, PB stated that the existing traffic control system in place (which limits 200m+ vessels moving when there is another vessel movement scheduled in the channel) is a successful de-confliction risk control. He acknowledged that there will be additional workboats in the Port, with some masters and crew not necessarily being too familiar with the environment. However, extra time will be needed to familiarise these crew members appropriately.	
4	Hazard Identification	
	PB suggested the following is taken into consideration when preparing the NRA: i) LGF project barges should be classified as Project Cargo; ii) Exclude recreational and fishing vessels; iii) Heavy Lift Vessels (HLV) also to be categorised as Project Cargo. iv) Diving should be assessed as part of Phase 1 (de-construction of existing jetties and construction of new quayside); v) Fire / Explosion should be scoped out; vi) Foundering and swamping hazards to be scoped out.	
5	Discussion / conclusion	
	LO indicates that more vessels unfamiliar with the Port could increase the risk of accidents.	
	LO states that an inspection of the former INEOS mooring jetties should be conducted to verify if any preliminary maintenance work should be done to ensure safe berthing conditions. It is not known when the bollards were last tested for example or whether there is sufficient lighting at night.	
	Pilot Exemption Certificates could be explored if the number of deliveries by the same small number of vessel masters warrant it. However, it will take a minimum of 2 – 3 months of training with 12 trips in to the Port and 12 trips out before a PEC can be issued. Further discussion on this will be held with the scheme promoter nearer the time.	

Annex E Notes from meeting with Navigator Terminals to present results of pNRA

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00



LIGHTHOUSE GREEN FUELS NRA

Project Title	Lighthouse Green Fuels pNRA
Project Number	0639
Meeting subject / purpose	Engagement with Navigator Terminals
Revision	R01-00
Date of meeting	13-Feb-26
Start time	10:00
Finish time	11:00
Client	Arup / Alfamar
Location	Via MS Teams

DOCUMENT CONTROL

Revision	Date of Issue	Description	Approved
R01-00	21-Feb-2026	Notes of meeting	SAB

ATTENDEES

Organisation	Attendee	Role	Initial
Navigator Terminals	[REDACTED]	Head of New Energy Markets at Navigator Terminals Energy Infrastructure Design & Investment Leader	MW
Navigator Terminals	[REDACTED]	New Energies Project Development Manager	JM
Navigator Terminals	[REDACTED]	Commercial Operations Manager	SS
PD Ports	[REDACTED]	Harbour Master	PB
Alfamar	[REDACTED]	Development Manager	JR
ARUP	[REDACTED]	Senior Consultant / Project Manager	CB
NASH Maritime	[REDACTED]	Associate Director – Ports & Harbours Team (Project Director)	SAB

These meeting notes should be distributed with and read in conjunction with the Powerpoint (PPT) presentation given at the meeting (ref 25-NASH-0639 Alfamar Nav Term Mtg 13-Feb-26-R01-00. References to the PPT presentation are included throughout these meeting notes.

AGENDA

- Introductions
- Session objectives
- Summary of proposed marine operation

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Lighthouse Green Fuels NRA 25-NASH-0639 R01-00		
	JR responded – options are being explored for increased landside plant. pNRA considers worst case scenario in terms of marine operation so can be considered conservative.	
3.4	MW asked for further clarity on project schedule as this will determine the number of vessel arrivals / departures that could potentially be impacted. JR responded – construction methodology is still being finalised, but construction operation will require careful planning and Navigator Terminals and PD Ports will be included in planning and scheduling discussions.	
3.5	JM queried vessel time alongside during Phase 3. JR responded – estimate around one week turnaround for Panamax vessels.	
4 Hazard Identification (slides 14 – 18)		
4.1	MW queries why Fire / Explosion had been excluded from the assessment. SAB commented that fire risk exists in the port already and is assessed as part of the port wide risk assessment. This is spontaneous fire/explosion, not due to a navigational collision. Fire/explosion might be a consequence of a collision etc. which is captured elsewhere. PB – PD Ports consider spontaneous fire / explosion as a terminal risk.	
5 pNRA Results (Slides 19 to 40)		
5.1	SAB presented an overview of the pNRA results.	
5.2	MW – queried whether the pNRA included an assessment of navigation hazards associated with the operation of Navigator Terminal 1. SAB – confirmed that operations associated with Jetty 1 were scoped out of the pNRA as the Jetty is not currently in use and there are no known plans to reinstate marine operations at this location. MW – confirmed that Navigator Terminals do have plans to use Jetty 1 in the future, but the exact nature of these operations is currently unknown.	MW to provide information relating Jetty 1 future marine operation envelope
5.3	PB highlighted that the swept paths (slides 23 to 26) are for operations when the moored vessel is not actually there so Closest Point of Approach is hypothetical. SAB concurred.	
5.4	JM asked how many tugs would be required to manoeuvre Panamax vessel on to / off berth. PB confirmed that generally 4 tugs are required.	
5.5	MW questioned source of AIS data. SAB explained that data was provided by PD Ports.	
5.6	SAB noted that exposure analysis conducted by NASH (slide 27) shows there is scope for deconfliction of marine operation based on an assessment of Jetty use. MW did not recognise quoted figures and would revert with Navigator Terminals percentage utilisation figures.	
6 Next Steps		
6.1	SAB explained that following further refinement of the proposed marine operation, jetty design and construction methodology a full NRA will be produced. Navigator Terminals input to the NRA will be sought and welcomed.	
6.2	MW confirmed preference for ongoing dialogue. Haskoning will provide comments on pNRA and then revert. SAB welcomed a conversation directly with Haskoning if required.	
6.3	JR suggested giving Navigator Terminals time to review the pNRA then requested a follow up session.	JM to propose
Meeting Minutes 13-Feb-2026		3

Lighthouse Green Fuels NRA
25-NASH-0639 | R01-00

JM will confirm potential dates for a follow up meeting.

follow up
meeting
dates,

Annex F Notes from final meeting with PD Teesport

AC25-NASH-0639_LGF NRA Update | PD Teesport Consultation



AC25-NASH-0639_LGF NRA UPDATE

Project Title	AC25-NASH-0639_LGF NRA Update
Project Number	0639
Meeting subject / purpose	PD Teesport Consultation
Revision	R01-00
Date of meeting	27-Apr-2026
Start time	11:00 BST
Finish time	12:00 BST
Client	Arup
Location	Microsoft Teams

DOCUMENT CONTROL

Revision	Date of Issue	Description	Approved
R01-00	27-Apr-2026	First draft issued for comment	JB/MB

ATTENDEES

Organisation	Attendee	Role	Initial
NASH Maritime		Principal Consultant Associate Director Graduate Maritime Consultant	MB AR JB
Arup		Senior Consultant	CB
PD Teesport		Harbour Master Deputy Harbour Master	PB LO
Alfanar		PM consenting	JR

AGENDA

1. Introductions
2. Project update and re-cap on pNRA results and recommended risk controls
3. Summary of changes proposed for NRA
4. Potential new navigational impact considerations
5. Additional factors to consider
6. Summary and questions

Meeting Minutes | R01-00

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AC25-NASH-0639_LGF NRA Update | PD Teesport Consultation



Meeting notes refer to information contained within the accompanying presentation slides (pdf document).

NOTES OF MEETING

1	Introductions	Action
1.1	- Introductions were made, with AR stating that he had taken over from SAB as NASH's Project Director for this piece of work. - MB outlined the agenda for the meeting.	
2	Project status update & re-cap on NRA results	
2.1	- MB sought re-confirmation from PD Teesport that the final Sustainable Aviation Fuels (SAF) product will be exported under the port's 'Business as Usual' operations - PB confirms. - MB states that NRA will not consider decommissioning. No objections from attendees.	
2.2	MB re-emphasises that the project raised risk scores slightly within the pNRA for a small number of identified hazards. However, these were all assessed as tolerable and ALARP. No comments from attendees.	
2.3	MB runs through additional risk control measures, specifically 3 & 4 which require HM approval. No comments from attendees.	
3	Summary of changes proposed for NRA	
3.1	- The construction of the quayside had now changed from a suspended key to combi-wall solution. In addition, the Marine Offload facility (MOF) is now positioned towards the north side of the Project Berth. - Through discussion with Navigator Terminals (NT), they have indicated that they intend to bring their No.1 Jetty back into use, however, despite a request for further information on vessel type, number, etc. this had not been forthcoming. - NT had also indicated that utilisation at No.2 and No.3 Jetty (as shown in the pNRA) was below their potential utilisation capacity, which they might seek to secure contracts for in the future. - JR responded by saying that, rather than seeking new or additional contracts, it is more a case that NT have clients that have already reserved the additional capacity as a mitigation (but this has not yet been taken up). JR has sought quantification of the additional capacity from NT but has been told it is commercially sensitive so cannot be released.	
3.2	Bund design MB explains that this design has not been confirmed yet, but as a cautious worst case, the NRA assumes the use of two jack-up barges during construction <i>and</i> the additional split hopper barge movements for the delivery of fill material should the bund be built. PB requested more detail on the indicative bund design, which CB will provide.	
3.3	Summary of changes - MB breaks down changes phase by phase, specifically that Panamax vessel involvement is only now assessed for Phase 3 as shallower drafted vessels are likely to be used for Phase 2. - JR stated that, whilst it is planned for aggregates to be delivered by road during Phase 1, a small amount <i>may</i> be delivered by barge to the existing quayside. There will be no dredging works to facilitate this.	

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2

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	- JR stated that, whilst it is planned for aggregates to be delivered by road during Phase 1, a small amount <i>may</i> be delivered by barge to the existing quayside. There will be no dredging works to facilitate this. - PB asks if they can use existing infrastructure (i.e. the Ineos jetties) for depositing aggregates, JR explains they will be opportunistic – Alfanar are 6 months away from this level of detail. PB states it doesn't change risk assessment for him, PD Teesport will be able to work around it.	
4	Potential new navigational impact considerations	
4.1	Encroachment on turning circle - MB presents the 40 m encroachment that an MC Class vessel may cause in the Med-moored position on the MOF. However, he stated that the exact type of Heavy Lift Vessel is still to be confirmed. If a CY Class HLV is used, there will be room to Med-moor without any encroachment into the turning circle. - PB asks for an indicative expected timescale on MC Class Med mooring. JR replied that it should be less than one day and hopefully it may be fully unloaded over a single tide. - PB states that timescale is key, but it is manageable. JR states Med mooring request was for North Sea barges (so smaller than an MC Class) but cannot confirm if this is the sole vessel type using this mooring configuration – the MC Class is absolute worst case in this regard. - PB states they can accommodate an MC Class even with a slight encroachment into the turning circle. He identified that its position may conflict tankers approaching NT's No.2 Jetty but, overall, PB doesn't perceive this as a significant problem. - MB presents density plot and PB concurs deconfliction plans would be required. MB asks if additional risk mitigation is required. PB states no and explains liaison meetings and good communication in advance are all that is required.	N/A
4.2	Navigator No.1 Jetty re-established - MB presents plots of available berth space and states that it is theoretically possible but questions if this is realistic. - PB states this is not practically possible and explains this is why No.1 Jetty has been disused for 20 years. He recalls that this was only possible when smaller, local chemical tankers were used in the past. - PB refers to previous Management Standards (SOPs) developed between adjacent terminal/jetty owners and the MoU between historic berth operators. PB offered to locate this document and send to the NRA Project Team. - JR asks for clarity on encroachment on the 'fence'. PB states 30 metre separation between berth tankers. This means a <u>15 metre</u> gap between tanker and each boundary 'fence' – if berthing less than 15 metres the operators would have to communicate between themselves to arrange this. - MB states that the infrastructure on No.1 Jetty is used for ships coming alongside at No.2 Jetty. PB states that new infrastructure may be required to berth ships on No.1 Jetty as a result. - PB states that the <u>30 metre</u> separation rule is flexible (it is possible to moor tankers closer when considering position of accommodation on the ship and the position of hazardous areas). LO confirms that there is an absolute minimum 20 metres distance between physical extent of vessels (for risk of explosion).	1
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	- MB showed an indicative plot with a 60 m tanker moored on No.1 Jetty whilst a 100 m tanker was moored on No.2 Jetty. This would allow for a 23 m distance between the bow and stern of the two alongside vessels, but the one on No.1 Jetty would need to move south-west of the existing jetty position and outside of NTs berth pocket (closer to proposed Project Berth) to achieve this configuration. - LO asks if Alfanar berth extends round towards NT No.4 Jetty and asks if a small vessel can go alongside this 'dog leg'. JR states that it is shaped that way to incorporate the wing wall for the dredge pocket and therefore can't be used. PB agrees.		
5	Additional factors to consider		
5.1	Additional capacity sold by navigator MB questions if the increase in vessel movements (presented) will affect port operations, PB states that it won't be an issue and LO concurs.		
5.2	Navigational risk summary - MB states that, following the scheme changes, the NRA Project Team does not perceive additional risk controls to be required and asks for concurrence. - PB questions relevance of bund – JR states this has been discussed with contractors and that the bund is an alternative option to piling from JUBs. The decision to construct a bund or not has not been made yet. - JR states that bund may bring about an improvement to underwater noise. JR states that bund may impact vessels navigating at NT. - PB asks for CAD drawing with bund dimension, depths etc. for review. - It is agreed a hybrid approach may be best – using JUB and bund. PB states they could provide sand for bund if it is required? JR states it will likely by clean granular fill.	2	
6	Summary and questions		
6.1	- PB sees no issue with the parameters of the NRA update. - LO asks for update on timescales – MB states NASH has submission for NRA and EIA at CoP 1st May. - JR confirms DCO to be submitted in July, states another call with NT will be useful – 3 or 4 weeks away from this. - PB is happy to be involved with future NT engagement if required. - JR states he is chasing information on NT No.1 Jetty but in the absence of receiving it, it is agreed reasonable assumptions are to be made. - JR asks if pipelines are present in the turning circle, PB states he doesn't think this is the case. - LO asks JR if Alfanar has joined the Tees and Hartlepool Port Users Association as a member. He advises that it is a useful forum /platform to inform local stakeholders of ongoing works on the river. JR states he will consider further. - MB asks LO if new admiralty chart exists, LO confirms it is chart no. 2566, edition 14, issued 22nd Jan – It's main update is that it removes reference to the former Ineos Jetties and Vopak terminals and that the words 'maintained depth' are now used instead of 'dredged depth' - MB requested any information from the Port of future growth plans – PB is aware of some internal <u>high level</u> figures which may be useful although will check to confirm if these can be referenced.	3 4 5 6	
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MEETING ACTIONS

Number	Owner	Action	Status
1	PB	To find and share ~~SoP~~ MoU between historic berth operators relating to distance between 2 moored vessels.	In progress
2	JR/CB	To provide a drawing with further detail on the specification of the potential bund.	In progress
3	JR	Arrange a further consultation with Navigator.	In progress
4	JB	To update NRA stating that a new chart exists with minor changes	Actioned
5	PB	To look into a future case scenario for the port e.g. in terms of vessel numbers etc..	In progress

Annex G Navigation Risk Assessment

Hazard Logs

Baseline Rank	Inherent Risk			Relevant to assessment	Hazard Title	Hazard Detail	Current Teesport Risk Assessment																				Lighthouse Green Fuels: Inherent Assessment of Risk																Additional Risk Control Measures		Lighthouse Green Fuels: Residual Assessment of Risk																				
	Residual Rank	Ref					Realistic Most Likely Scores					Realistic Worst Credible Scores					Baseline Risk Score	Most Likely Results				Worst Credible Results				Realistic Most Likely Scores					Realistic Worst Credible Scores					Baseline Risk Score	Most Likely Results				Worst Credible Results																								
		Frequency	Environment				People	Property	Stakeholders	Frequency	Environment	People	Property	Stakeholders	Environment	People		Property	Stakeholders	Environment	People	Property	Stakeholders	Frequency	Environment	People	Property	Stakeholders	Frequency	Environment	People	Property	Stakeholders	Frequency	Environment		People	Property	Stakeholders	Frequency	Environment	People	Property	Stakeholders																					
12	11	14	16	Yes	Collision - General Cargo Vessel ICW Workboat	General Cargo Vessel collides with a Workboat	4	1	2	1	1	2	3	4	4	4	3.5	0.0	3.5	0.0	0.0	3.5	4.9	4.9	4.9	4	1	2	1	1	3	3	4	4	4	4.0	0.0	3.5	0.0	0.0	4.4	5.9	5.9	5.9			4	1	2	1	1	2	3	4	4	4	3.5	0.0	3.5	0.0	0.0	3.5	4.9	4.9	4.9
15	6	9	39	Yes	Collision - Tanker ICW Workboat	Tanker collides with a Workboat	4	1	2	1	1	2	2	4	4	4	3.4	0.0	3.5	0.0	0.0	1.8	4.9	4.9	4.9	5	1	2	1	1	3	2	4	4	4	4.6	0.0	5.9	0.0	0.0	2.4	5.9	5.9	5.9			5	1	2	1	1	2	2	4	4	4	4.1	0.0	5.9	0.0	0.0	1.8	4.9	4.9	4.9
16	8	7	35	Yes	Collision - Workboat ICW Workboat	Workboat collides with another Workboat	3	1	2	1	1	2	2	5	4	4	3.3	0.0	2.4	0.0	0.0	1.8	5.9	4.9	4.9	5	1	2	1	1	2	2	5	4	4	4.4	0.0	5.9	0.0	0.0	1.8	5.9	4.9	4.9			5	1	2	1	1	2	2	5	4	4	4.4	0.0	5.9	0.0	0.0	1.8	5.9	4.9	4.9
38	31	43	48	Yes	Contact - Vessel with Navigation Buoy	Any vessel type contacts a navigational buoy.	4	1	1	1	1	3	2	3	2	2	1.8	0.0	0.0	0.0	0.0	2.4	4.4	2.4	2.4	5	1	1	1	1	4	2	3	2	2	2.5	0.0	0.0	0.0	0.0	3.5	5.9	3.5	3.5			3	1	1	1	1	2	2	3	2	2	1.4	0.0	0.0	0.0	0.0	1.8	3.5	1.8	1.8
28	28	28	14	Yes	Contact berth - Workboat	A Workboat contacts a berth	5	1	1	1	1	4	1	3	3	3	2.6	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9	5	1	1	1	1	4	1	3	3	3	2.6	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9			5	1	1	1	1	4	1	3	3	3	2.6	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9
3	2	3	42	Yes	Contact vessel alongside berth - Tanker	A Tanker contacts a vessel alongside a berth	4	2	1	3	1	2	4	4	4	5	4.8	3.5	0.0	5.9	0.0	4.9	4.9	4.9	5.9	4	2	1	3	1	3	4	4	4	5	5.4	3.5	0.0	5.9	0.0	5.9	5.9	5.9	7.0			4	2	1	3	1	2	4	4	4	5	4.8	3.5	0.0	5.9	0.0	4.9	4.9	4.9	5.9
41	38	37	1	Yes	Contact vessel alongside berth - Workboat	A Workboat contacts a vessel alongside a berth	5	1	1	1	1	2	1	3	3	3	1.5	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.5	5	1	1	1	1	3	1	3	3	3	1.9	0.0	0.0	0.0	0.0	0.0	4.4	4.4	4.4			5	1	1	1	1	3	1	3	3	3	1.9	0.0	0.0	0.0	0.0	0.0	4.4	4.4	4.4
35	34	33	11	Yes	Diving Incident	Diving Incident - Incident involving Recreational / Commercial Activities	4	1	1	1	1	2	1	4	2	4	2.9	0.0	0.0	0.0	0.0	0.0	4.9	1.8	4.9	5	1	1	1	1	3	1	4	2	4	2.4	0.0	0.0	0.0	0.0	0.0	5.9	2.4	5.9			5	1	1	1	1	3	1	4	2	4	2.4	0.0	0.0	0.0	0.0	0.0	5.9	2.4	5.9
44	36	35	9	Yes	Grounding - Workboat	A Workboat runs aground	5	1	1	1	1	2	1	2	3	2	1.3	0.0	0.0	0.0	0.0	0.0	1.8	3.5	1.8	5	1	1	1	1	4	1	2	3	2	2.3	0.0	0.0	0.0	0.0	0.0	3.5	5.9	3.5			5	1	1	1	1	4	1	2	3	2	2.3	0.0	0.0	0.0	0.0	0.0	3.5	5.9	3.5
24	24	24	38	Yes	Mooring Incident - All Vessel	A vessel ranges or breaks away from its mooring	5	1	1	1	1	3	3	3	4	4	2.8	0.0	0.0	0.0	0.0	4.4	4.4	5.9	5.9	5	1	1	1	1	3	3	3	4	4	2.8	0.0	0.0	0.0	0.0	4.4	4.4	5.9	5.9			5	1	1	1	1	3	3	3	4	4	2.8	0.0	0.0	0.0	0.0	4.4	4.4	5.9	5.9
27	27	27	10	Yes	Tug Girting	A tug in difficulty/gets during towage operations (for example during a project cargo operation)	4	1	1	1	1	2	2	5	4	5	2.6	0.0	0.0	0.0	0.0	1.8	5.9	4.9	5.9	4	1	1	1	1	2	2	5	4	5	2.6	0.0	0.0	0.0	0.0	1.8	5.9	4.9	5.9			4	1	1	1	1	2	2	5	4	5	2.6	0.0	0.0	0.0	0.0	1.8	5.9	4.9	5.9

Baseline Rank	Inherent Rank	Residual Rank	Ref	Relevant to assessment	Hazard Title	Current Teesport Risk Assessment											Lighthouse Green Fuels: Inherent Assessment of Risk											Additional Risk Control Measures			Lighthouse Green Fuels: Residual Assessment of Risk																		
						Realistic Most Likely Scores					Realistic Worst Credible Scores					Baseline Risk Score	Realistic Most Likely Scores					Realistic Worst Credible Scores					Baseline Risk Score	1	2	4	Realistic Most Likely Scores					Realistic Worst Credible Scores					Baseline Risk Score	Most Likely Results				Worst Credible Results			
						Frequency	Environment	People	Property	Stakeholders	Frequency	Environment	People	Property	Stakeholders		Frequency	Environment	People	Property	Stakeholders	Frequency	Environment	People	Property	Stakeholders					Frequency	Environment	People	Property	Stakeholders	Frequency	Environment	People	Property	Stakeholders		People	Property	Environment	Business	People	Property	Environment	Business
41	41	41	1	Yes	Contact vessel alongside berth - Workboat	5	1	1	1	1	2	1	3	3	3	1.5	5	1	1	1	1	2	1	3	3	3	1.5				5	1	1	1	1	2	1	3	3	3	1.5	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.5
29	22	29	3	Yes	Collision - Workboat ICW Project Cargo	3	1	2	1	1	1	2	4	4	3	2.6	4	1	2	1	1	1	2	4	4	3	2.9				3	1	2	1	1	1	2	4	4	3	2.6	0.0	2.4	0.0	0.0	1.5	4.1	4.1	2.9
44	44	44	9	Yes	Grounding - Workboat	5	1	1	1	1	2	1	2	3	2	1.3	5	1	1	1	1	2	1	2	3	2	1.3				5	1	1	1	1	2	1	2	3	2	1.3	0.0	0.0	0.0	0.0	0.0	1.8	3.5	1.8
27	28	27	10	Yes	Tug Girting	4	1	1	1	1	2	2	5	4	5	2.6	4	1	1	1	1	2	2	5	4	5	2.6				4	1	1	1	1	2	2	5	4	5	2.6	0.0	0.0	0.0	0.0	1.8	5.9	4.9	5.9
28	29	28	14	Yes	Contact berth - Workboat	5	1	1	1	1	4	1	3	3	3	2.6	5	1	1	1	1	4	1	3	3	3	2.6				5	1	1	1	1	4	1	3	3	3	2.6	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9
12	14	12	16	Yes	Collision - General Cargo Vessel ICW Workboat	4	1	2	1	1	2	3	4	4	4	3.5	4	1	2	1	1	2	3	4	4	4	3.5				4	1	2	1	1	2	3	4	4	4	3.5	0.0	3.5	0.0	0.0	3.5	4.9	4.9	4.9
19	12	19	22	Yes	Collision - Tanker ICW Project Cargo	3	1	2	2	1	1	4	4	4	5	3.3	4	1	2	2	1	1	4	4	4	5	3.7				3	1	2	2	1	1	4	4	4	5	3.3	0.0	2.4	2.4	0.0	4.1	4.1	4.1	5.1
39	35	39	23	Yes	Contact vessel alongside berth - Project Cargo Vessel	3	1	1	1	1	1	2	4	3	3	1.7	4	1	1	1	1	2	2	4	3	3	2.1				3	1	1	1	1	1	2	4	3	3	1.7	0.0	0.0	0.0	0.0	1.5	4.1	2.9	2.9
29	30	29	25	Yes	Grounding - Project Cargo	3	1	1	2	1	1	3	2	4	4	2.6	3	1	1	2	1	1	3	2	4	4	2.6				3	1	1	2	1	1	3	2	4	4	2.6	0.0	0.0	2.4	0.0	2.9	1.5	4.1	4.1
26	23	26	27	Yes	Collision - General Cargo Vessel ICW Project Cargo	2	1	2	2	1	1	3	4	4	4	2.7	3	1	2	2	1	1	3	4	4	4	2.9				2	1	2	2	1	1	3	4	4	4	2.7	0.0	1.8	1.8	0.0	2.9	4.1	4.1	4.1
4	2	4	30	Yes	Contact vessel alongside berth - General Cargo Vessel	4	1	1	3	1	3	3	4	4	4	4.7	5	1	1	3	1	3	3	4	4	4	5.5				4	1	1	3	1	3	3	4	4	4	4.7	0.0	0.0	5.9	0.0	4.4	5.9	5.9	5.9
40	40	40	34	Yes	Contact berth - Project Cargo Vessel	4	1	1	1	1	2	2	3	3	3	1.6	5	1	1	1	1	2	2	3	3	3	1.6				4	1	1	1	1	2	2	3	3	3	1.6	0.0	0.0	0.0	0.0	1.8	3.5	3.5	3.5
16	18	16	35	Yes	Collision - Workboat ICW Workboat	3	1	2	1	1	2	2	5	4	4	3.3	3	1	2	1	1	2	2	5	4	4	3.3				3	1	2	1	1	2	2	5	4	4	3.3	0.0	2.4	0.0	0.0	1.8	5.9	4.9	4.9
24	13	24	38	Yes	Mooring Incident - All Vessel	5	1	1	1	1	3	3	3	4	4	2.8	5	1	1	1	1	4	3	3	4	4	3.5				5	1	1	1	1	3	3	3	4	4	2.8	0.0	0.0	0.0	0.0	4.4	4.4	5.9	5.9
15	17	15	39	Yes	Collision - Tanker ICW Workboat	4	1	2	1	1	2	2	4	4	4	3.4	4	1	2	1	1	2	2	4	4	4	3.4				4	1	2	1	1	2	2	4	4	4	3.4	0.0	3.5	0.0	0.0	1.8	4.9	4.9	4.9
3	3	3	42	Yes	Contact vessel alongside berth - Tanker	4	2	1	3	1	2	4	4	4	5	4.8	4	2	1	3	1	3	4	4	4	5	5.4				4	2	1	3	1	2	4	4	4	5	4.8	3.5	0.0	5.9	0.0	4.9	4.9	4.9	5.9

Baseline Risk Inherent Risk	Residual Risk	Ref	Relevant to assessment	Hazard Title	Hazard Data	Current Teesport Risk Assessment																Lighthouse Green Fuels: Inherent Assessment of Risk																Additional Risk Control Measures	Lighthouse Green Fuels: Residual Assessment of Risk																										
						Realistic Most Likely Scores								Realistic Worst Credible Scores								Baseline Risk Score	Most Likely Results				Worst Credible Results				Realistic Most Likely Scores				Realistic Worst Credible Scores				Baseline Risk Score	Most Likely Results				Worst Credible Results																					
						Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency		Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency			Environment	People	Property	State holders																						
Deconification	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders	Frequency	Environment	People	Property	State holders																									
41	41	41	1	Yes	Contact vessel alongside berth - Workboat	A Workboat contacts a vessel alongside a berth	5	1	1	1	1	2	1	3	3	3	1.5	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.5	5	1	1	1	1	2	1	3	3	3	1.5	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.5		5	1	1	1	1	2	1	3	3	3	1.5	0.0	0.0	0.0	0.0	0.0	3.5	3.5	3.5	
29	29	29	3	Yes	Collision - Workboat ICW Project Cargo	Workboat collides with a Project Cargo move	3	1	2	1	1	1	2	4	4	3	2.6	0.0	2.4	0.0	0.0	1.5	4.1	4.1	2.9	3	1	2	1	1	1	2	4	4	3	2.6	0.0	2.4	0.0	0.0	1.5	4.1	4.1	2.9		3	1	2	1	1	1	2	4	4	3	2.6	0.0	2.4	0.0	0.0	1.5	4.1	4.1	2.9	
44	44	44	9	Yes	Grounding - Workboat	A Workboat runs aground	5	1	1	1	1	2	1	2	3	2	1.3	0.0	0.0	0.0	0.0	0.0	1.8	3.5	1.8	5	1	1	1	1	1	2	1	2	3	2	1.3	0.0	0.0	0.0	0.0	0.0	1.8	3.5	1.8		5	1	1	1	1	2	1	2	3	2	1.3	0.0	0.0	0.0	0.0	0.0	1.8	3.5	1.8
27	27	27	10	Yes	Tug Girding	A tug in difficulty/girts during towage operations (for example during a project cargo operation)	4	1	1	1	1	2	2	5	4	5	2.6	0.0	0.0	0.0	0.0	1.8	5.9	4.9	5.9	4	1	1	1	1	2	2	5	4	5	2.6	0.0	0.0	0.0	0.0	1.8	5.9	4.9	5.9		4	1	1	1	1	2	2	5	4	5	2.6	0.0	0.0	0.0	0.0	1.8	5.9	4.9	5.9	
28	28	28	14	Yes	Contact berth - Workboat	A Workboat contacts a berth	5	1	1	1	1	4	1	3	3	3	2.6	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9	5	1	1	1	1	4	1	3	3	3	2.6	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9		5	1	1	1	1	4	1	3	3	3	2.6	0.0	0.0	0.0	0.0	0.0	5.9	5.9	5.9	
12	12	12	16	Yes	Collision - General Cargo Vessel ICW Workboat	General Cargo Vessel collides with a Workboat	4	1	2	1	1	2	3	4	4	4	3.5	0.0	3.5	0.0	0.0	3.5	4.9	4.9	4.9	4	1	2	1	1	2	3	4	4	4	3.5	0.0	3.5	0.0	0.0	3.5	4.9	4.9	4.9		4	1	2	1	1	2	3	4	4	4	3.5	0.0	3.5	0.0	0.0	3.5	4.9	4.9	4.9	
19	19	19	22	Yes	Collision - Tanker ICW Project Cargo	Tanker collides with a Project Cargo move	3	1	2	2	1	1	4	4	4	5	3.3	0.0	2.4	2.4	0.0	4.1	4.1	4.1	5.1	3	1	2	2	1	1	4	4	4	5	3.3	0.0	2.4	2.4	0.0	4.1	4.1	4.1	5.1		3	1	2	2	1	1	4	4	4	5	3.3	0.0	2.4	2.4	0.0	4.1	4.1	4.1	5.1	
39	39	39	23	Yes	Contact vessel alongside berth - Project Cargo Vessel	A Project Cargo contacts a vessel alongside a berth	3	1	1	1	1	1	2	4	3	3	1.7	0.0	0.0	0.0	0.0	1.5	4.1	2.9	2.9	4	1	1	1	1	1	2	4	3	3	1.7	0.0	0.0	0.0	0.0	1.5	4.1	2.9	2.9		3	1	1	1	1	1	2	4	3	3	1.7	0.0	0.0	0.0	0.0	1.5	4.1	2.9	2.9	
29	29	29	25	Yes	Grounding - Project Cargo	A Project Cargo runs aground	3	1	1	2	1	1	3	2	4	4	2.6	0.0	0.0	2.4	0.0	2.9	1.5	4.1	4.1	3	1	1	2	1	1	3	2	4	4	2.6	0.0	0.0	2.4	0.0	2.9	1.5	4.1	4.1		3	1	1	2	1	1	3	2	4	4	2.6	0.0	0.0	2.4	0.0	2.9	1.5	4.1	4.1	4.1
26	21	26	27	Yes	Collision - General Cargo Vessel ICW Project Cargo	General Cargo Vessel collides with a Project Cargo move	2	1	2	2	1	1	3	4	4	4	2.7	0.0	1.8	1.8	0.0	2.9	4.1	4.1	4.1	3	1	2	2	1	1	3	4	4	4	2.9	0.0	2.4	2.4	0.0	2.9	4.1	4.1	4.1		2	1	2	2	1	1	3	4	4	4	2.7	0.0	1.8	1.8	0.0	2.9	4.1	4.1	4.1	
4	4	4	30	Yes	Contact vessel alongside berth - General Cargo Vessel	A General Cargo Vessel contacts a vessel alongside a berth	4	1	1	3	1	3	3	4	4	4	4.7	0.0	0.0	5.9	0.0	4.4	5.9	5.9	5.9	4	1	1	3	1	3	3	4	4	4	4.7	0.0	0.0	5.9	0.0	4.4	5.9	5.9	5.9		4	1	1	3	1	3	3	4	4	4	4.7	0.0	0.0	5.9	0.0	4.4	5.9	5.9	5.9	
40	40	40	34	Yes	Contact berth - Project Cargo Vessel	A Project Cargo contacts a berth	4	1	1	1	1	2	2	3	3	3	1.6	0.0	0.0	0.0	0.0	1.8	3.5	3.5	3.5	4	1	1	1	1	2	2	3	3	3	1.6	0.0	0.0	0.0	0.0	1.8	3.5	3.5	3.5		4	1	1	1	1	2	2	3	3	3	1.6	0.0	0.0	0.0	0.0	1.8	3.5	3.5	3.5	
16	16	16	35	Yes	Collision - Workboat ICW Workboat	Workboat collides with another Workboat	3	1	2	1	1	2	2	5	4	4	3.3	0.0	2.4	0.0	0.0	1.8	5.9	4.9	4.9	3	1	2	1	1	2	2	5	4	4	3.3	0.0	2.4	0.0	0.0	1.8	5.9	4.9	4.9		3	1	2	1	1	2	2	5	4	4	3.3	0.0	2.4	0.0	0.0	1.8	5.9	4.9	4.9	
24	25	24	38	Yes	Moorring Incident - All Vessel	A vessel ranges or breaks away from its mooring	5	1	1	1	1	3	3	3	4	4	2.8	0.0	0.0	0.0	0.0	4.4	4.4	5.9	5.9	5	1	1	1	1	3	3	3	4	4	2.8	0.0	0.0	0.0	0.0	4.4	4.4	5.9	5.9		5	1	1	1	1	3	3	3	4	4	2.8	0.0	0.0	0.0	0.0	4.4	4.4	5.9	5.9	
15	15	15	39	Yes	Collision - Tanker ICW Workboat	Tanker collides with a Workboat	4	1	2	1	1	2	2	4	4	4	3.4	0.0	3.5	0.0	0.0	1.8	4.9	4.9	4.9	4	1	2	1	1	2	2	4	4	4	3.4	0.0	3.5	0.0	0.0	1.8	4.9	4.9	4.9		4	1	2	1	1	2	2	4	4	4	3.4	0.0	3.5	0.0	0.0	1.8	4.9	4.9	4.9	
3	2	3	42	Yes	Contact vessel alongside berth - Tanker	A Tanker contacts a vessel alongside a berth	4	2	1	3	1	2	4	4	4	5	4.8	3.5	0.0	5.9	0.0	4.9	4.9	4.9	4.9	4	2	1	3	1	3	4	4	4	5	5.4	3.5	0.0	5.9	0.0	5.9	5.9	7.0		4	2	1	3	1	2	4	4	4	5	4.8	3.5	0.0	5.9	0.0	4.9	4.9	4.9	4.9		



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