NASH MARITIME

LONDON RESORT:

NAVIGATION RISK ASSESMENT SPECIFICATION

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Buro Happold Ltd

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1. INTRODUCTION

1.1. NAVIGATION RISK ASSESSMENT PROCESS

NASH Maritime Ltd have been contracted by Buro Happold to deliver shipping and navigation services including a preliminary Navigational Risk Assessment (pNRA) to support London Resort Company Holdings Limited (LRCH) in developing the "London Resort" (LR) project. The objective of the pNRA is to assess and quantify the navigation risks posed by the project during its construction and operational phases and to identify risk control measures which ensure that residual risks are acceptable. The pNRA supports a Development Consent Order[1] (DCO) submission and subsequent Planning Inspectorate Examination for the LR project. Navigation risk assessment is an iterative process. It is expected that the pNRA will be updated as new and more detailed information becomes available during the project design development and implementation.

1.2. DOCUMENT SCOPE AND PURPOSE

This report sets out a specification for the preliminary Navigation Risk Assessment required to support the DCO. The specification has been developed in consultation with the key stakeholders: London Resort Company Holdings, (through Buro Happold), the Statutory Harbour Authority (SHA) - Port of London Authority (PLA) and relevant interested parties identified at this stage including Port of Tilbury London Ltd (PoTLL).

This document describes the key components of the pNRA including: data requirements, study area(s), NRA methodology, and future consultation. This document includes an initial and preliminary assessment of navigation risk, to inform the scope requirements of the NRA.

1.3. REPORT STRUCTURE

The report sections are as follows:

- Section 2: Description of the London Resort and its key marine/river features.
- Section 3: Summary of relevant legislation and guidance - review of legislation and guidance relevant to the NRA.
- Section 4: Stakeholder Consultation - NRA consultation to date and future requirements.
- Section 5: Baseline Environment and Key Issues – preliminary review of baseline vessel traffic conditions and key identified issues.

[1] The LR DCO application was submitted to the Planning Inspectorate on 31st December 2020 and was accepted for examination by the Inspectorate on 28th January 2021.

- Section 6: Proposed Methodology for NRA:
    - Data requirements
    - Locations and study area
    - Risk assessment matrix and methodology
    - Study Execution
- Section 7: Summary Scope.

2. LONDON RESORT PROJECT OVERVIEW

2.1. INTRODUCTION

The LR is designed to become a world-class entertainment resort founded on sustainable and low carbon principles. The focus of the Resort will be a 'Leisure Core' containing a range of events spaces, themed rides and attractions, entertainment venues, theatres and cinemas, developed in landscaped settings in two phases known as Gate One and Gate Two ('the Gates'). Gates One and Two will be developed in phases with Gate One facilities operational while Gate Two is constructed. Outside the Gates will be a range of ancillary retail, dining and entertainment facilities in an area known as the Market. The Resort will also include hotels, a water park connected to one of the hotels, a conference and convention centre known as a 'conferention centre', a Coliseum (capable of hosting e-Sports events), creative spaces, a transport interchange including car parking, 'back of house' service buildings, an energy centre, a wastewater treatment works and utilities required to operate the Resort. Related housing is also proposed to accommodate some of the Resort's employees.

The LR will be principally based on the Swanscombe Peninsula in North Kent, set over approximately 465 hectares including a new dedicated access road to the A2 and access from Ebbsfleet International station. This section of the Project Site to the south of the River Thames is referred to as the 'Kent Project Site'. A ferry terminal will also provide access to the Kent Project Site.

Transport facilities will be provided on the north side of the river Thames, at the 29.5 hectare "Essex Project Site" set. The Essex Project Site lies immediately east of the port of Tilbury and to the west of Tilbury2. At the south-east corner of the Tilbury port lies the Tilbury Ferry Terminal incorporating the London International Cruise Terminal (a grade II* listed building featuring a floating landing stage and series of bridge structures).

Cross river ferry services will be provided from the Essex Project Site east of Tilbury Port to the Kent Project Site on the Swanscombe Peninsular.

Figure 1 shows the Swanscombe Peninsular in the Thames estuary with Tilbury Docks in the background.

If the DCO is made, construction of the Project is anticipated to start in 2022 with the first phase of the London Resort (Gate 1) opening in 2024. Work on site for Gate 2 is anticipated to start during 2027 and be complete in 2029.

Figure 1: London Resort Project Location.

2.2. KEY MARINE FEATURES

Marine features of the proposed development include new and improved jetties/piers/wharves/pontoons and new ferry services. There are also options for a new roll-on roll-off (Ro-Ro) platform and dredging. At this stage some of the details of the proposed operations and detailed design of infrastructure are to be finalised. The following descriptions are based on the design assumptions in the Outline Construction Method Statement submitted with the DCO application in December 2020[2]. Further development of these designs by BH is ongoing.

2.2.1. DURING CONSTRUCTION OF GATE 1

2.2.1.1. Kent Project Site

Three options are presented for the marine facilities to be developed/used at the Kent project site (see **Figure 2**).

A wastewater outfall and several surface water outfalls are to be installed on the Kent Project Site. The design of the WWTP is being developed but the general concept is for the outfalls to be relatively close to the shoreline. Locations will need to be confirmed once the design is progressed.

[2] The London Resort Development Consent Order, BC080001, Environmental Statement, Volume 2: Appendices, Appendix 3.1- Outline Construction Method Statement (Doc Ref 6.2.3.1, Rev 00, Dec 2020)

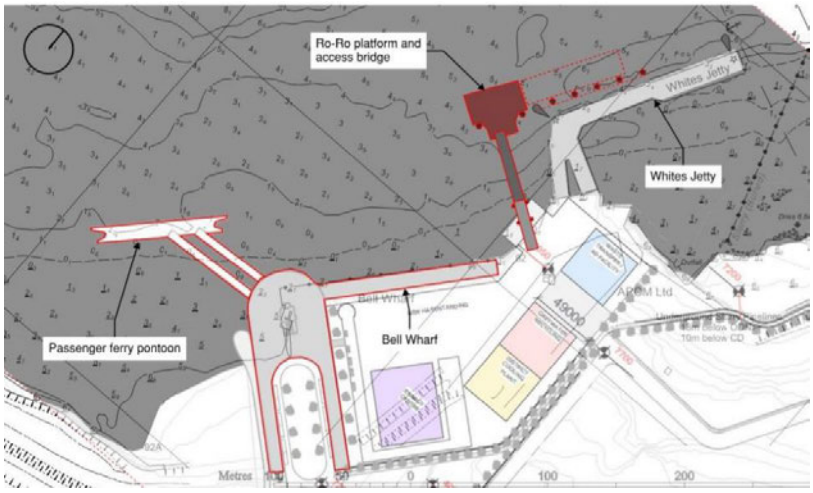
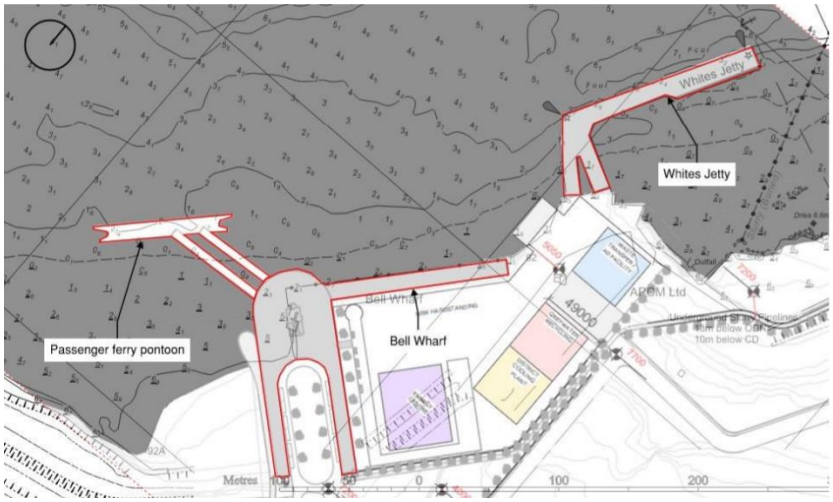
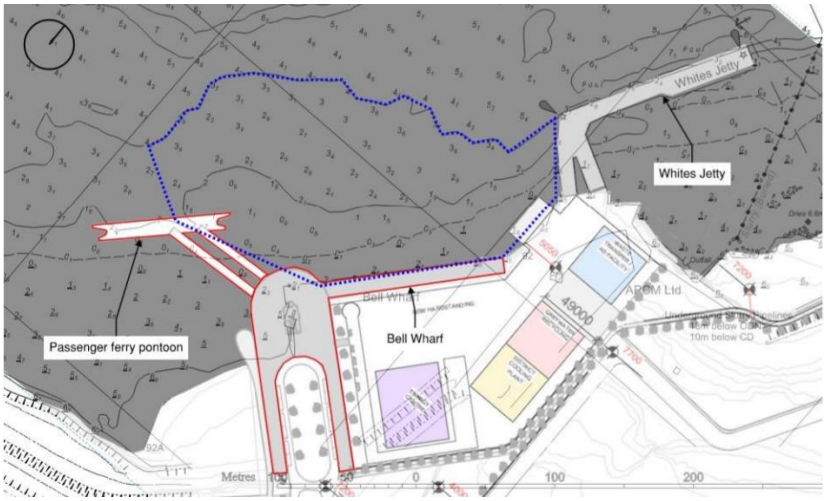
Option A • New passenger ferry pontoon; • Refurbishment of Bell Wharf; and • Construction of a new floating Ro-Ro platform and access bridge	
Option B • New passenger ferry pontoon; • Refurbishment of Bell Wharf; and • Refurbishment/ reinforcement of Whites Jetty	
Option C • New passenger ferry pontoon; • Refurbishment of Bell Wharf; and • Dredging to deepen access to Bell Wharf	

Figure 2: Kent site options.

Marine plant – will be required for construction of the new facilities/refurbishment of the existing facilities and for the dredging operations as follows:

- Installation of guide piles for floating pontoons and linkspan and strengthening of structures to install additional piles and superstructure – most likely using an anchored or 'spud' barge.
- Installation of pontoons - prefabricated offsite and most likely offloaded from an anchored barge.
- Installation of linkspan – prefabricated off site and craned into position from shore or anchored barge.
- Refurbishment of open piled structures – most likely after construction of a temporary sheetpile, bund or diaphragm wall to allow dewatering. These structures might be installed by floating plant or from the land.
- Dredging – most likely undertaken using backhoe dredgers and associated hopper barges, with material disposed of in a licenced offshore spoil area.

Construction workers for Gate 1 and Gate 2 may use passenger vessels from Tilbury to the new passenger ferry pontoon once built.

2.2.1.2. Essex Project Site

At the Essex project site, a single option is proposed for a new floating pontoon to provide a new passenger ferry and to incorporate the existing ferry service from Tilbury to Gravesend whilst providing layby berthing for Thames Clippers vessels (see **Figure 3**).

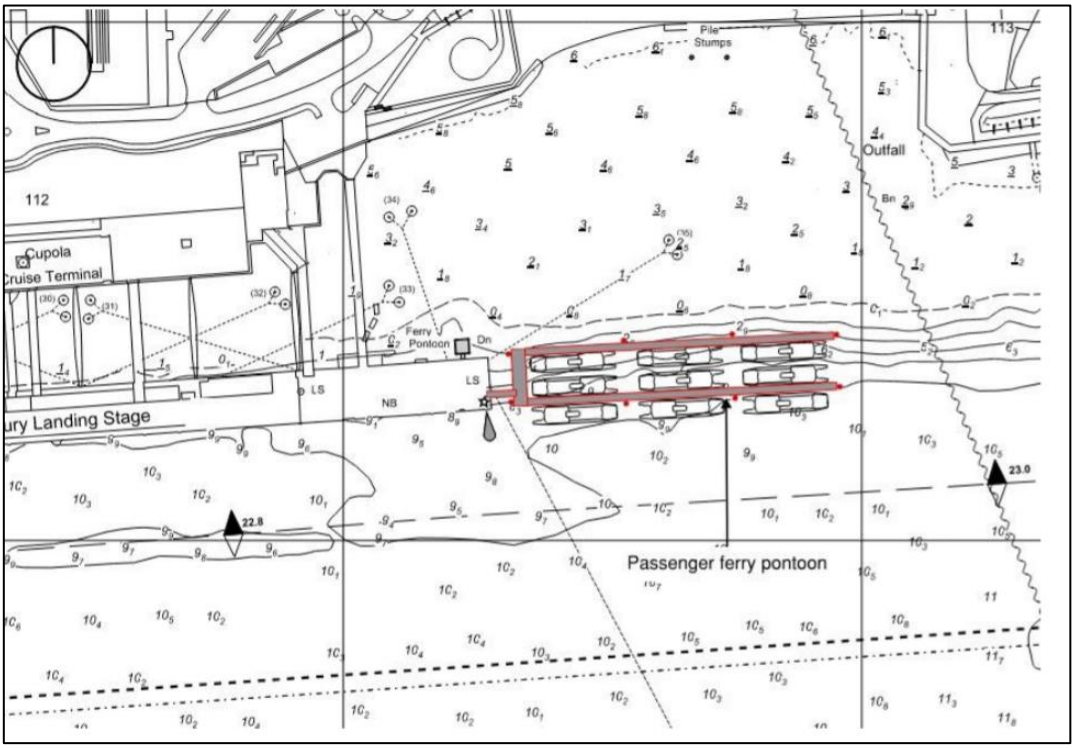


Figure 3: Essex Marine Site.

The PLA has expressed concerns about the layout in **Figure 3** (see **Annex D**) and BH will develop an alternative design using feedback from PLA and from the initial stages of the pNRA.

Marine plant – (still to be defined) will likely be required to bring the pontoon to site and to install guide piles/retaining structures. Details are to be developed by BH.

2.2.1.3. River Site

During construction there will be additional vessel movements on the river Thames as follows:

- Barges will be used for material supply to and waste removal from the Kent Project Site by transporting it upstream or downstream (TBC by contractor);
- Ro-Ro vessels will be used for material supply and waste removal between the Kent Project site/Seacon Terminal and Tilbury;
- Ferries will be used to transport workers from/to the Essex Project Site to/from the Kent Project site;
- Dredgers or barges will be used to move dredged material from the Kent Project Site to disposal sites downstream;
- Construction vessels to support marine piling, jetty refurbishment and construction and pontoon installation; and
- Construction vessels to support wastewater and surface water outfall installations on the Kent Project Site.

2.2.2. DURING CONSTRUCTION OF GATE 2

2.2.2.1. Kent Site

During construction of Gate 2:

- All in-river structures will have been installed/completed on completion of Gate 1 construction;
- Material supply and waste removal by barge and Ro-Ro will still be required;
- Seacon Terminal will continue to be used;
- Some construction workers will still arrive by ferry; and
- Visitors will arrive at the site by passenger ferry.

2.2.2.2. Essex Site

All in-river structures will have been installed/completed on completion of Gate 1 construction. Some construction workers will still travel to the Kent Project Site by ferry from the Essex Project Site [it is not clear if this will be using the passenger ferries or dedicated staff/worker ferries – TBC during pNRA].

Visitors will arrive at the site by passenger ferry.

2.2.2.3. River Site

For the river site:

- Barges and Ro-Ro will continue as described for Gate 1;
- There will be no other in-river construction vessels;
- Ferries for construction workers may continue to operate; and
- Passenger ferries for visitors will operate from central London and Essex Project Site to Kent Project Site.

2.2.3. OPERATIONS PERIOD

On completion of Gate 2 vessel (barges and Ro-Ro) traffic for material supply and waste removal will continue but reduce in number/frequency. There will be no construction worker specific ferries. Passenger ferry frequency may increase and passenger numbers will increase.

2.3. EXTENT AND POWERS PROPOSED WITHIN THE DEVELOPMENT CONSENT ORDER AND DEEMED MARINE LICENCE

2.3.1. DCO

The Draft Development Consent Order[3] (DCO) seeks to establish the powers necessary to undertake the project. These include powers in relation to construction of temporary and permanent structures in and adjacent to the river Thames and navigation along/across the Thames. These powers are sought within the Order Limits of the DCO illustrated in **Figure 4**.

Sections of the DCO most relevant to shipping and navigation are summarised in **Annex A** and key items outlined below:

- Part 2 - identifies the principal powers under the DCO
- Part 4 - gives supplementary powers to potentially impact navigation, discharge water (subject to consent) carry out protective works to structures and survey within the DCO boundaries subject to agreement of the PLA;
- Part 6 – notes the requirements for consent from Crown Estate for certain activities below MHW, identifies the Deemed Marine Licence (Schedule 11), suspends some PLA byelaws and Port of Tilbury (Expansion) Order and permits new temporary byelaws regulating the Thames.

[3] London Resort 3.1 Draft Development Consent Order, APFP Regulations 5(2)(b) Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Volume 3, October 2020, TR010032/3.1, Version1.0

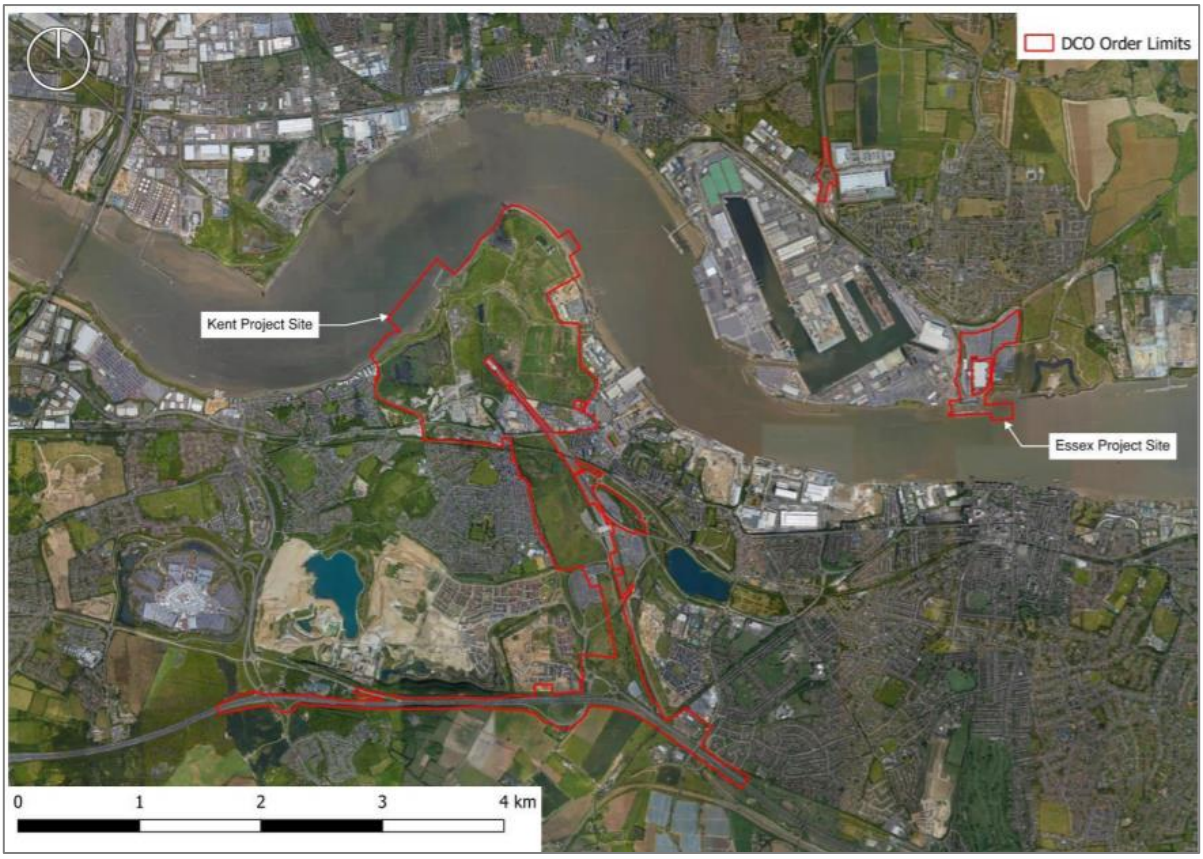


Figure 4: DCO Order Limits

- Schedule 1 authorises the development, including marine jetties/wharf development, outfall construction and installation of navigation aids;
- Schedule 2 – places a requirement for further NRA's prior to commencement of work, based on the draft [preliminary] NRA; and
- Schedule 11 - provides details of the Deemed Marine License (see Section 2.3.2 below).

2.3.2. DEEMED MARINE LICENCE

The Deemed Marine Licence (DML) includes permission to develop any of the marine structures/features described in the Environmental Statement, as summarised below, but permits only one of the three options described for the Kent Project Site.

1. Within the limit of deviation for Work No. 15, the construction of a floating pontoon with linkspan on the river Thames on the south-western side of the Swanscombe peninsula;
2. Within the limit of deviation for Work No. 16, construction of a floating pontoon with linkspan on the north side of the river Thames;
3. Within the limit of deviation for Work No. 15, alteration works to Bell Wharf;
4. The construction of a number of outfall structures;

5. Either within the limit of deviation for Work No. 14a, the construction of a roll on roll off facility on the river Thames on the north-western side of the Swanscombe Peninsula; or
6. Within the limit of deviation for Work No. 14a, alteration works to refurbish and repair White's Jetty; or
7. Within the limit of deviation for Work No. 15, dredging works at Bell Wharf, which may include, a capital dredge in the area immediately in front of Bell Wharf, to allow vessel access throughout the tidal cycle; and
8. Within the limits of deviation for Works Nos. 14a, 14c, 15 and 16, such other works as may be necessary or convenient for the purposes of, or in connection with or in consequence of, the construction, maintenance, operation or use of the authorised development,

Only one of the licensable marine activities (5,6,7) may be constructed.

The DML also identifies the need to notify the MMO of the plans and vessels to be used in advance of starting the works.

3. RELEVANT LEGISLATION AND GUIDANCE

The following section provides details of the legislation and guidance, procedures and practices required to be taken into account when conducting a NRA for a development in the marine environment in this project area.

3.1. LEGISLATION

The following legislation is to be considered when conducting the NRA:

- Harbours, Docks & Piers Clauses Act 1847.
- Transport Docks Act 1964.
- British Transport Docks Act 1972.
- Transport Act 1981.
- International Port and Ship Security Code 2004
- Port of London Act 1968
- Port of London Thames Byelaws 2012

3.2. GUIDANCE, PROCEDURES, PRACTICES

The following are to be considered during NRA which includes PLA regulations, codes of practice and other general guidance as published on their website (www.pla.co.uk):

- Maritime and Coastguard Agency (MCA) Port Marine Safety Code;[4]
- Maritime and Coastguard Agency (MCA) Port Marine Safety Code – "Guide to Good Practice."; [5]
- Port of London Marine Safety Management System;
- General Directions for Navigation in the Port of London 2021;
- Port of London Pilotage Directions 2017 (as amended);
- Code of Practice for Craft Towage Operations on the Thames;

[redacted]

- Code of Practice for the Management and Operation of Commercial Vessels on the Thames, 2013;
- Code of Practice for the Safe Mooring of Vessels on the Thames, 2010;
- Code of Practice for Passenger Vessel Operations on the Thames, 2016;
- Code of Practice for Rowing & Paddling on the Tidal Thames;
- Recreational Users Guide; and
- Other codes of practice for mooring, berth operators. etc.

4. STAKEHOLDER CONSULTATION

Consultation with the SHA and port users will be essential in informing the pNRA. The aim of the consultation will be to elicit local stakeholder and regulator knowledge on navigation matters to ensure any potential location specific navigational concerns and impacts, related to the proposed construction and operation at LR, are identified and can be considered in the pNRA.

4.1. PREVIOUS STAKEHOLDER CONSULTATION

Consultation meetings have been held with the PLA and other stakeholders from the early genesis of the project in 2014, through to submission of the DCO at the end of December 2020. Following the submission of the DCO, further consultation meetings were held with the PLA and emails exchanged regarding key issues. Some of the main consultation events and outcomes are referenced below.

4.1.1. RESPONSES TO ENVIRONMENTAL SCOPING REPORT

Formal responses to the Environmental Scoping Report (BC080001-000225-LNRS-Scoping Report part 1) were submitted by several organisations. A summary of the key relevant navigation issues and the response by LR provided in the River Transport chapter[6] of the Environmental Statement (ES) submitted with the DCO is presented in **Annex B**.

4.1.2. RELEVANT RESPONSES TO THE 2020 STATUTORY CONSULTATION

Relevant responses to the 2020 statutory consultation and the project's consideration of these in the ES are summarised in the River Transport report and presented in **Annex C**.

4.1.3. STAKEHOLDER MEETINGS DURING 2020

During 2020 the BH team held meetings with PLA and other stakeholders to discuss navigation issues on 06 April, 19 June, 05 August and 06 October. The final meeting was a navigation risk assessment hazard workshop held with the PLA and others. Minutes of these meetings are appended to the BH pNRA[7] submitted with the DCO in December 2020. A summary of the key issues resulting from these consultations (including follow up in 2021) is included in **Annex D**.

4.1.4. 22 APRIL 2021 MEETING – NAVIGATION RISK ASSESSMENT SCOPING UPDATE

NASH Maritime, PLA and BH attended a meeting to discuss the scope of the pNRA, where NASH Maritime presented the current understanding of the proposed project, the previous stakeholder consultation, the key issues and the proposed approach/methodology for an updated pNRA:

[6] The London Resort Development Consent Order, Environmental Statement Volume 1: Main Statement, Chapter 10 – River Transport, Doc Ref 6.1.10, Dec 2020

[7] The London Resort Development Consent Order, Environmental Statement Volume 2: Appendices, Appendix 10.1 – Preliminary Navigation Risk Assessment, Doc Ref 6.2.10.1, Dec 2020

- A copy of the presentation to this meeting is included in **Annex E;** and
- A copy of the meeting minutes is included in **Annex F.**

4.2. FUTURE STAKEHOLDER CONSULTATION REQUIREMENTS

The following organisations are to be consulted during the pNRA:

Table 1 Organisations to be consulted during pNRA

Type	Organisation	Type	Organisation
PLA		**Large Port**	
	Harbour Masters		Port of Tilbury
	Pilots, VTS, Pilot launch	**Other Commercial**	
SAR			ADM Pura Foods Ltd
	RNLI		Brett Concrete
Recreational			Cemex
	Gravesend Rowing Club		Cory Riverside Energy
	Gravesend Yacht Club		GPS Marine Contractors
	Thurrock Yacht Club		Hanson Aggregates
Vessel Operators			Industrial Chemicals Group Ltd
	AJ & A Pratt		Lafarge
	Bennetts Barges Ltd		Medtow Marine
	Boluda Towage Europe		Navigator
	CLDN		Nustar
	Jetstream Tours		Palmers Marine Services Ltd
	Kent Marine Towage Ltd		Red 7 Marine
	HCH Marine ltd		S Walsh & Sons Ltd

	River Fuels Ltd		Seacon Terminals Ltd
	Ship Bunkering Services Ltd		Tarmac
	Svitzer Thames		Thameside Services Marine Ltd
	Thames Clippers		United Marine Aggregates
	Various Cruise Ship Companies		WPH Marine Ltd

Relevant interfacing projects may also need to be consulted/considered. A preliminary list of potentially relevant project is shown in Table 2

Table 2 Potential Interfacing Projects

No	ID	Applicant for 'other development' and brief description (text in red indicates aspects which may impact on navigation safety)	Distance from project
1	TR030003	Tilbury2 Port Expansion by Port of Tilbury London Limited. DCO application for a new port facility acting alongside the existing Port of Tilbury. Granted 20/4/2019	c. 4.3km east of Kent site c. 820 east of Essex site
2	EN010092	Thurrock Flexible Generation Plant, by Thurrock Plant Ltd. Causeway for new port Accepted for examination	c. 4.0km east of Kent site. c. 400m east of Essex site.
3	TR010032	Lower Thames Crossing, by Highways England Exclusion zones over tunnel DCO in preparation	c. 5.4km east of Kent site c. 2.6km east of Essex site.
4	EN010089	Tilbury Energy Centre, by RWE Generation UK plc Intakes, outfalls, jetty Project frozen 2018	c. 4.6km east of Kent site c. 1.8km east of Essex site
8 45	TR030004 TR030004-000005	Oikos Marine and South Side Development by Oikos Storage Ltd DCO application for the alteration of existing harbour facilities by the installation of additional import and export infrastructure and equipment. Application expected Q3 2021	c. 17.5km north east of Kent site. c. 14km north east of Essex site.

No	ID	Applicant for 'other development' and brief description (text in red indicates aspects which may impact on navigation safety)	Distance from project
9	16/00201/EDCCON	Eastern Quarry, Swanscombe by Barton Wilmore. A mixed use development, and facilities for mooring, launching and landing watercraft. Granted 23/01/2013	c. 1.4km south of Kent site c. 4.6 km south west of Essex site.
17	17/01814/FUL	The Pier, by Crest Nicholson (c/o Barton Wilmore) Mixed use development including …. riverside walk, boat trailer park development platform and slipway, …. Awaiting decision 20/04/2021	Directly adjacent to western boundary of Kent site. c. 4.9km west of Essex site.
31	17/01668/OUT	Mixed use development, Purfleet, by Purfleet Centre Regeneration Ltd (c/o Savills) Application for outline planning permission for mixed-use redevelopment involving…..rebuilding, repairing, replacing and upgrading of river wall and flood defence wall and associated works of repair and reinstatement of the former Yara Purfleet Terminal jetty and the former Cory's Wharf jetty to facilitate the river wall and flood defence works Granted 20/12/2019	c. 5.0km north west of Kent site. c. 9.3km north west of Essex site.
43	20090286	Bulk aggregates import terminal handling up to 3 Mt per annum and associated infrastructure including reinstated rail access. Granted 21/02/2021	c. 830m east of Kent site c. 2.2km south west of Essex site
44	TR010021	Silvertown Tunnel by Transport for London DCO application for a new road tunnel passing under the River Thames between Silvertown and North Greenwich. Temporary jetty and NABSA berth at Thames Wharf for spoil removal Granted 10/05/2018	c. 21 km north west of Kent site c. 25km north west of Essex site

5. BASELINE ENVIRONMENT

5.1. NAVIGATION OVERVIEW

The LR project is situated on the River Thames which is used by a wide variety of vessel types including general cargo vessels, tankers, ro-ro vessels, and less regular users such as cruise ships and naval vessels. There is also a pilot boarding area located in the eastern extent of the study area, with vessels approaching, slowing and manoeuvring to board and land pilots from a dedicated pilot launch service.

The Port of Tilbury is located to the eastern extent of Gravesend Reach and is a major multi-modal port with several berths within the impounded dock and additional river berths, including the London International Cruise Terminal. Additional river berths at Tilbury2 to the immediate west of the LR Essex project site were opened in 2020 at the former site of Tilbury Power Station. The primary marine components of Tilbury 2 are a Construction Materials and Aggregates Terminal (CMAT) for handling and processing bulk construction materials and a Ro-Ro terminal for import and export of freight. This is expected to result in an increase in bulk and general cargo vessels and ro-ro vessels transiting this area which may not be represented in baseline vessel traffic data due to the recency of its opening and also potential impacts due to Covid-19.

PLA pilots use the Tilbury landing stage as a base for their operations in the area. This involves multiple pilot vessel transits to and from the landing stage, to vessels requiring pilotage and across the river to the Port Control facility at Royal Pier in Gravesend.

A regular passenger ferry service also operates from the Tilbury Landing Stage to Gravesend Town Pier Monday to Saturday all year round. There are two services per hour, giving 26 vessel movements per day in each direction. It has a capacity of 50 passengers. It is operated by Jetstream Tours on behalf of Kent County Council and Thurrock Council.

PoTLL also use a series of dolphins upstream of the Tilbury Landing stage for Ro-Ro vessel operations.

Recreational vessels such as yachts motorboats and rowing boats also operate in the area, including from the Thurrock Yacht Club at Kilverts Wharf in Grays and Broadness Cruising Club in Broadness Creek.

5.2. NAVIGATION FEATURES

A defined navigation channel is marked on Admiralty and PLA charts as shown in **Figure 5.** This runs roughly down the centre of the river Thames throughout the study area.

At the Kent Project Site the St Clement anchorage extends throughout and beyond most of the DCO Order Limits around Bells Wharf and Whites Jetty. Two fixed buoys are shown within the anchorage and others are located further upstream.

At the Essex Project site, other than the Tilbury Landing Stage/Cruise Terminal and Ro-Ro berth, the other navigational feature close to (but outside) the Order Limits is a buried submarine cable just to the east.

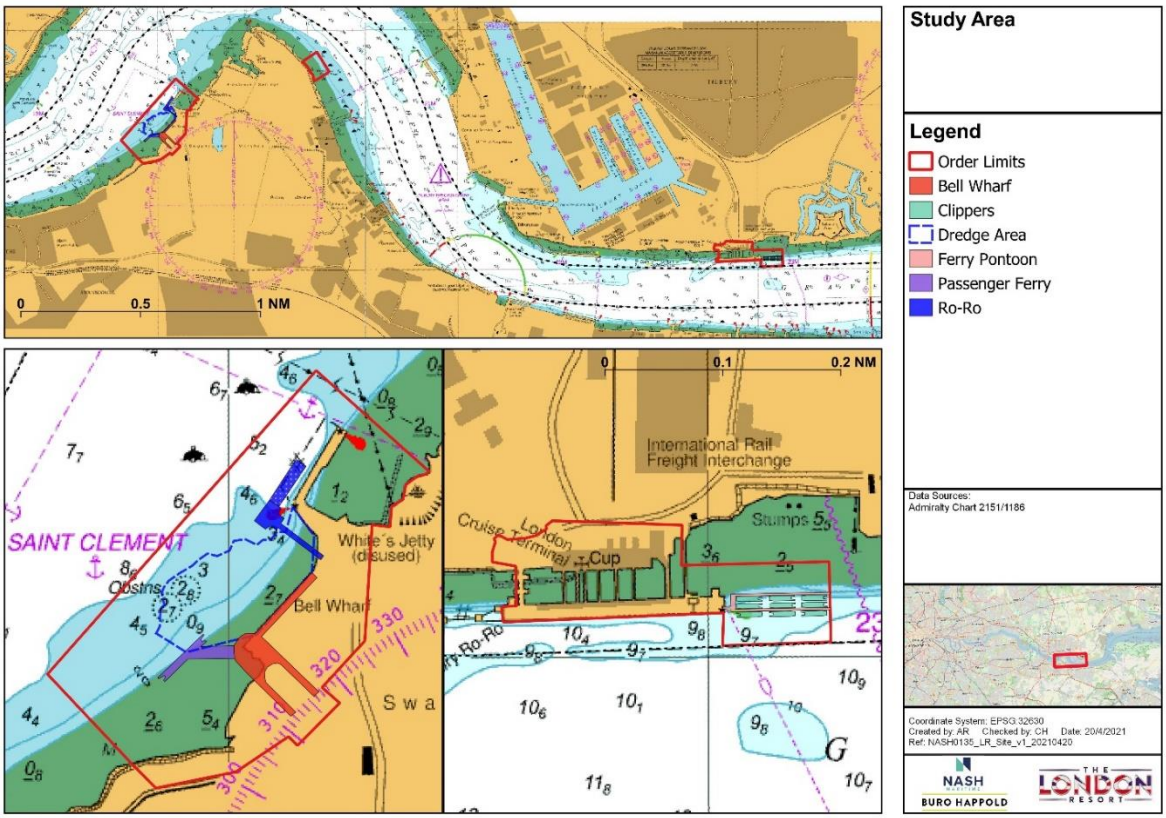


Figure 5: Navigation Features in the Project Vicinity.

5.3. BASELINE VESSEL TRAFFIC

Figure 6 shows an annualised distribution of vessels passing through a 'gate' across the river at the Kent Project Site. As illustrated in the track plots there is a high frequency of vessel passages in this area, which peaks in the navigation channel, and declines in number towards the Kent Project Site DCO Order Limits.

Figure 7 and **Figure 8** present initial vessel traffic analysis based on AIS[8] data from 2019. The data show vessel tracks for selected key vessel types to demonstrate the spatial disposition of vessel traffic and allow early interpretation of the baseline traffic around the LR project.

[8] AIS data is vessel position data transmitted by vessels engaged in commercial cargo or passenger operations. AIS data is transmitted periodically (between 1 sec to 6 minutes) by VHF radio, depending on vessel mode of operation (transiting speed, turning, berthed, or anchored etc.), and includes vessel specification termed "static" information (e.g. identification number, size, type, etc.) and "dynamic" information (e.g. speed, heading, position, etc.).

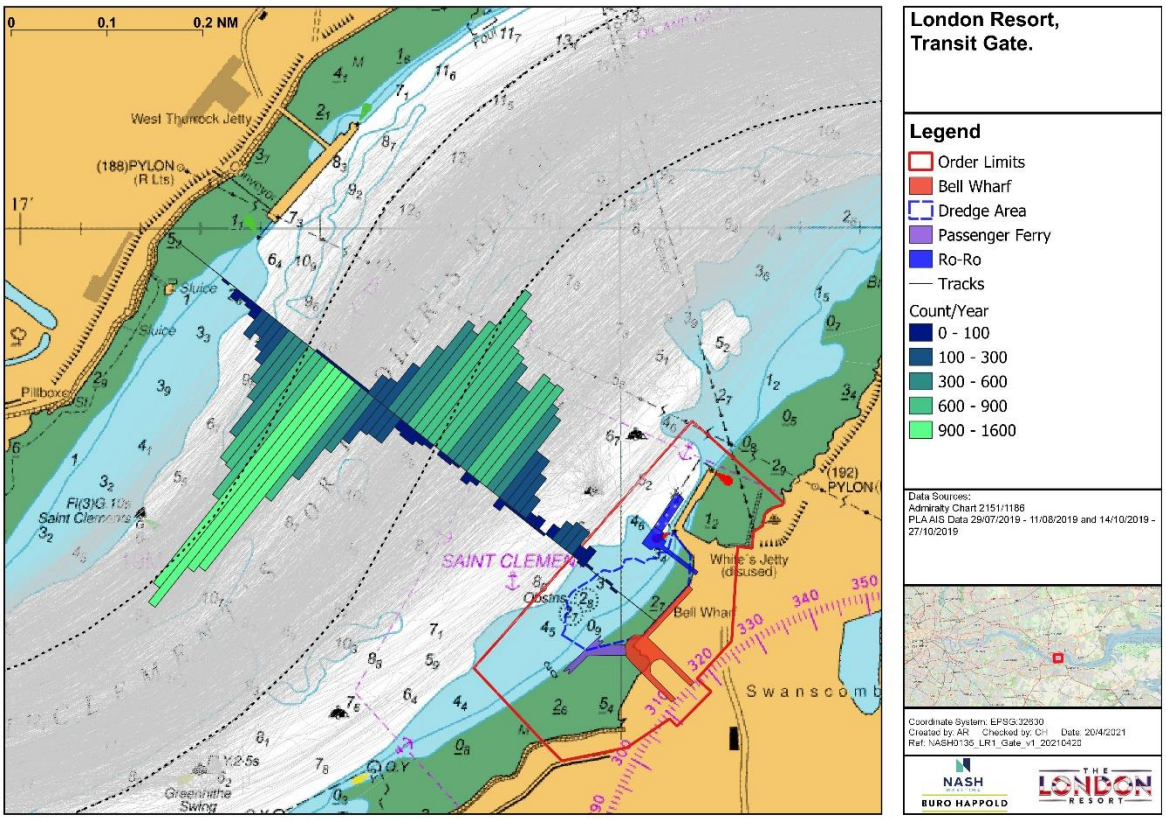


Figure 6 Initial Vessel Traffic – Gate Analysis – Kent Project Site.

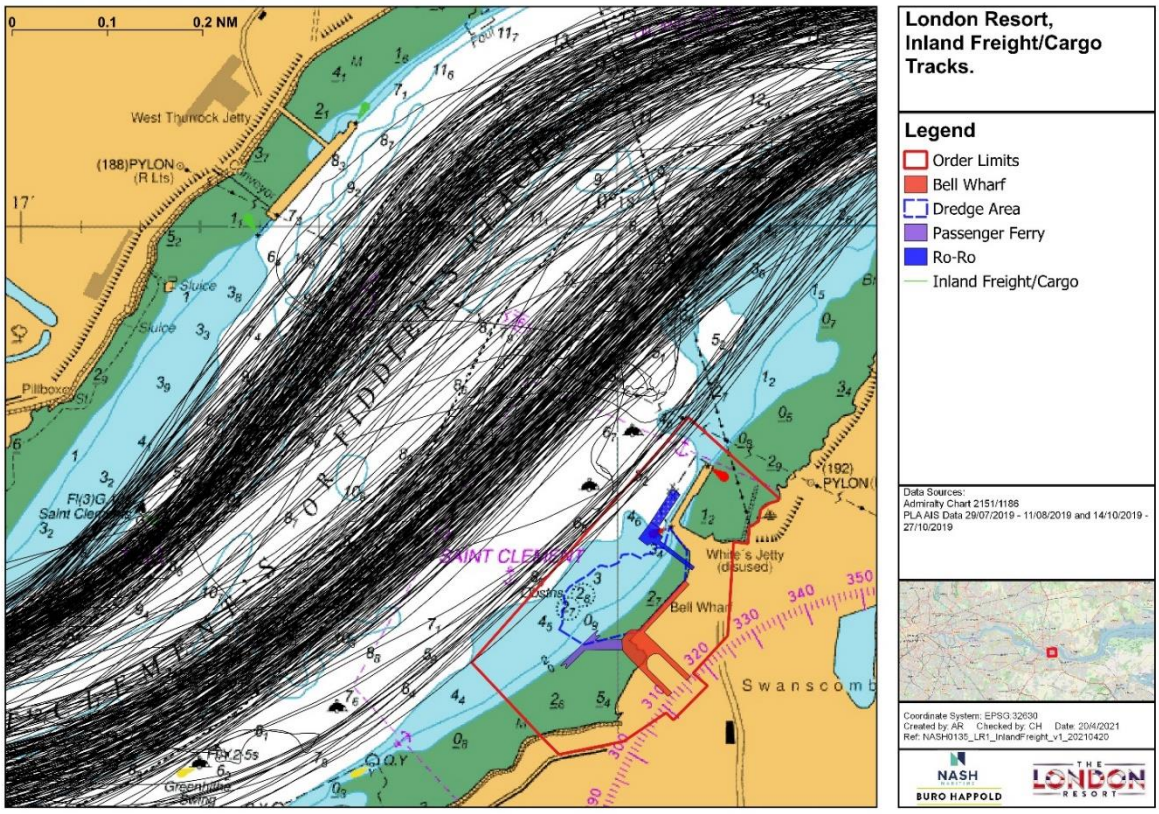


Figure 7: Initial Vessel Traffic: Inland Freight/Cargo – Kent Project Site.

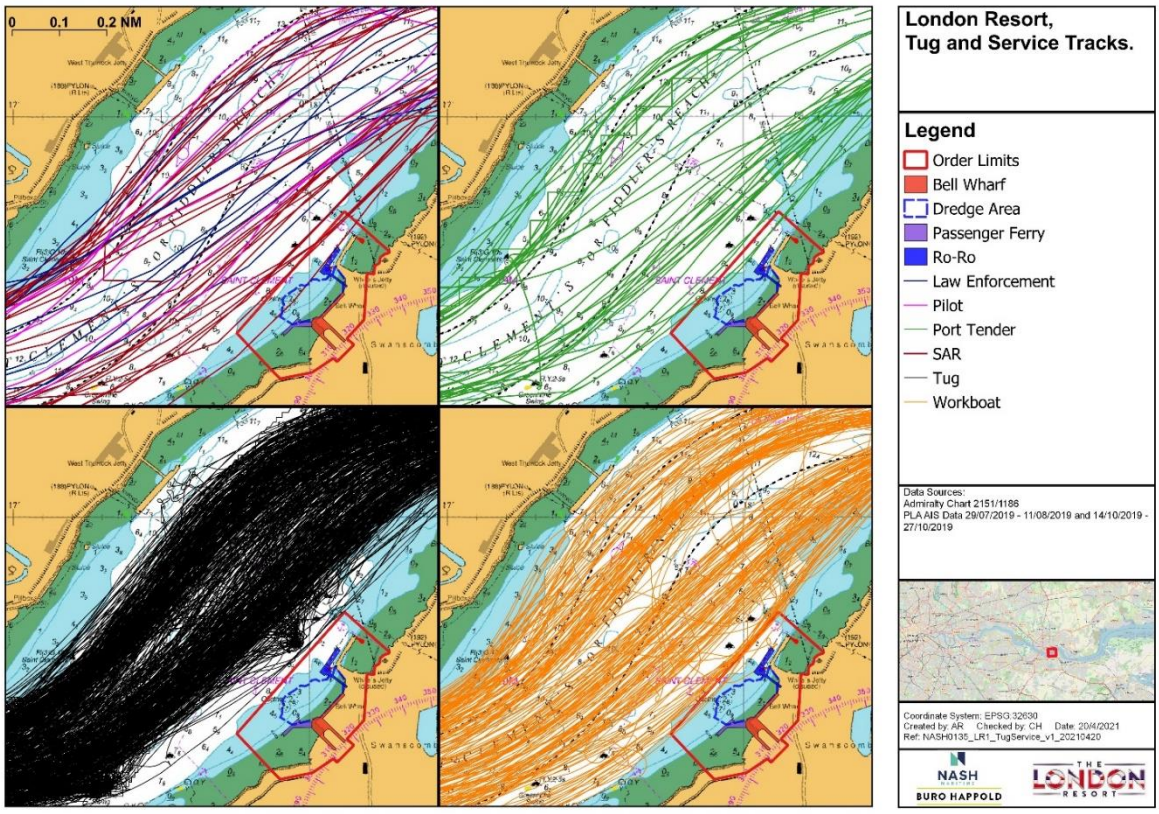


Figure 8: Initial Vessel Traffic: Tug/Service Vessels- Kent Project Site.

The vessel track plot in **Figure 7** shows inland/freight cargo tracks past the Kent Project site. Features to note are that while most tracks remain broadly within the PLA authorised navigation channel, quite a number transit outside of the channel, on both sides of the river, and several tracks are close to/within the DCO order limits.

The vessel traffic plot in **Figure 8** shows tug and service vessels passing the Kent Project site. There is a high density of tug and workboat tracks, with several workboat tracks approaching /crossing the DCO Order Limits. Though fewer in number the Search and Rescue (SAR) and Port Tender vessel track also cross the Order Limits.

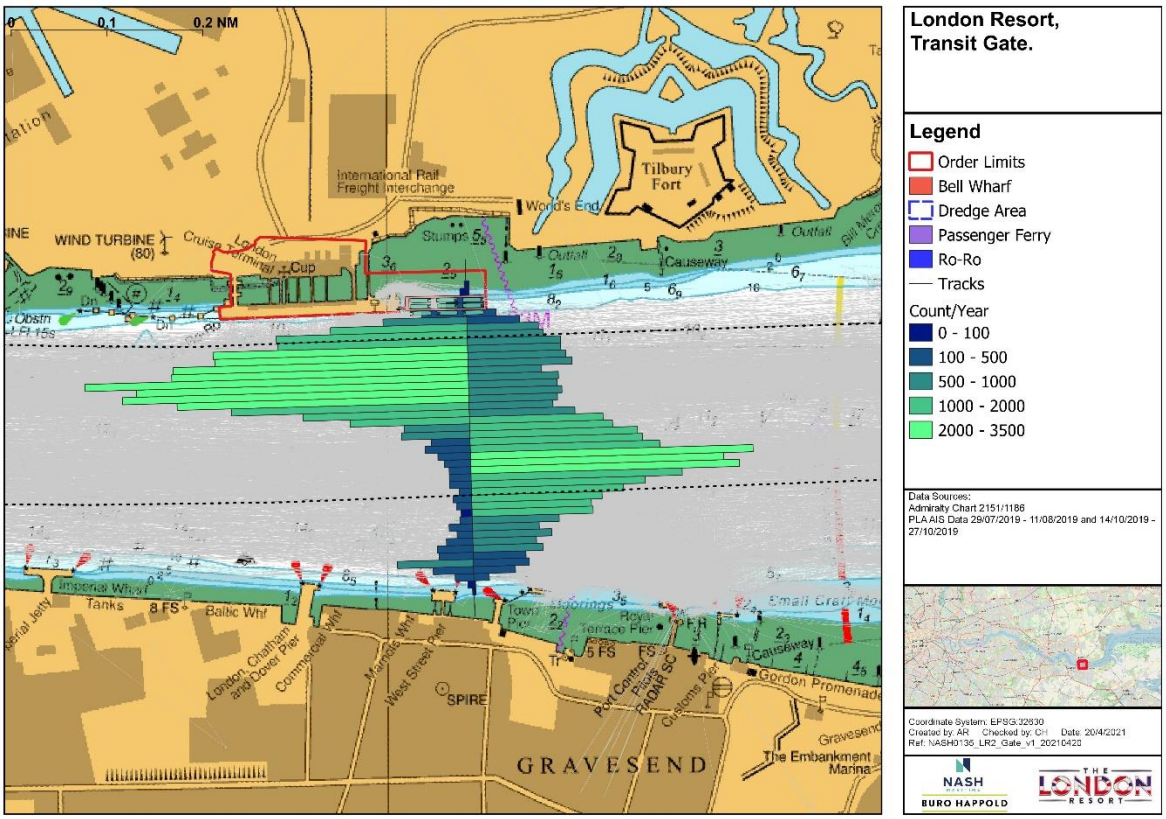


Figure 9 Initial Vessel Traffic: Gate Analysis - Essex Project Site

The gate analysis in Figure 9 shows significantly higher vessel traffic densities both up and downstream past the Essex Project Site than seen in **Figure 6** for the Kent Project Site. This is largely accounted for by three principal vessel movements:

- The Tilbury to Gravesend Ferry;
- Pilot boat activity; and
- Vessels proceeding to/from Tilbury, which do not pass further upstream.

Figure 10 shows inland freight vessel tracks past the Essex Project Site indicating many vessels remaining within the navigation channel with a few crossing the DCO Order Limits and some (freight) vessels turning on and off the berths at the London Cruise Terminal. There are also many tracks to/from the Town Pier in Gravesend.

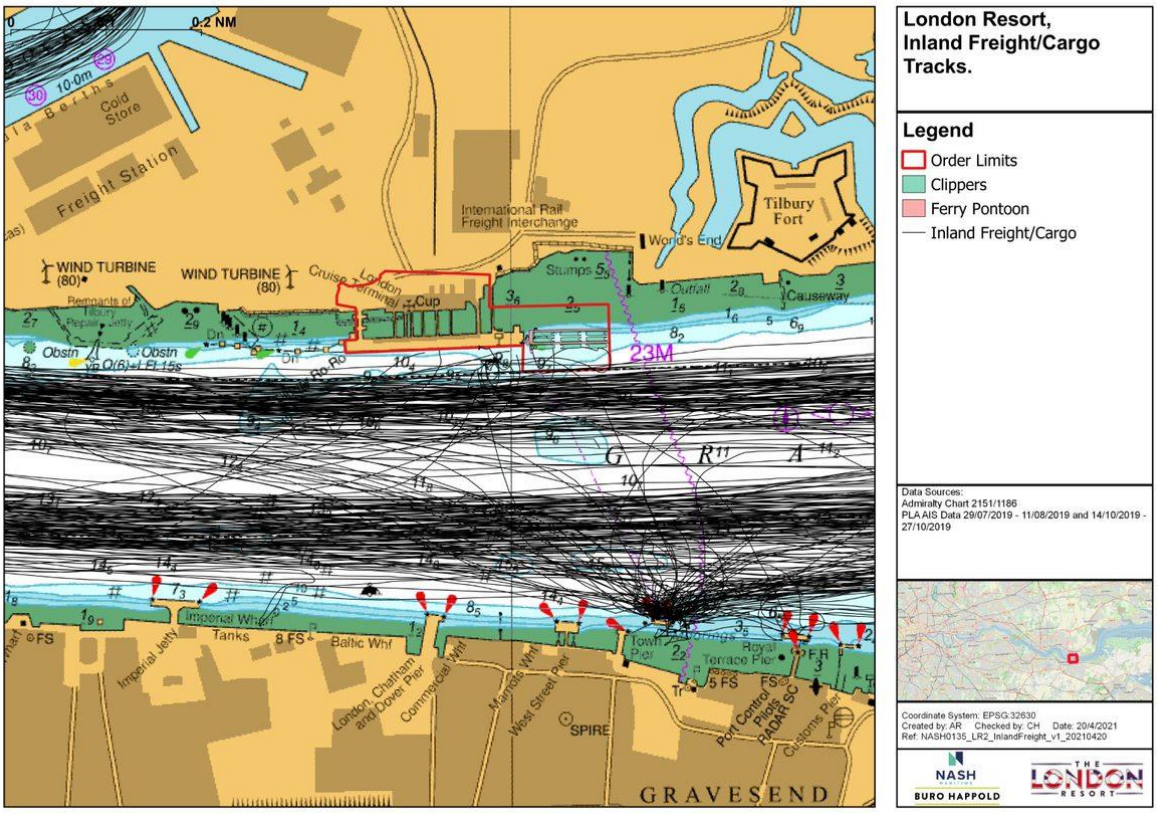


Figure 10: Initial Vessel Traffic: Inland Freight - Essex Project Site.

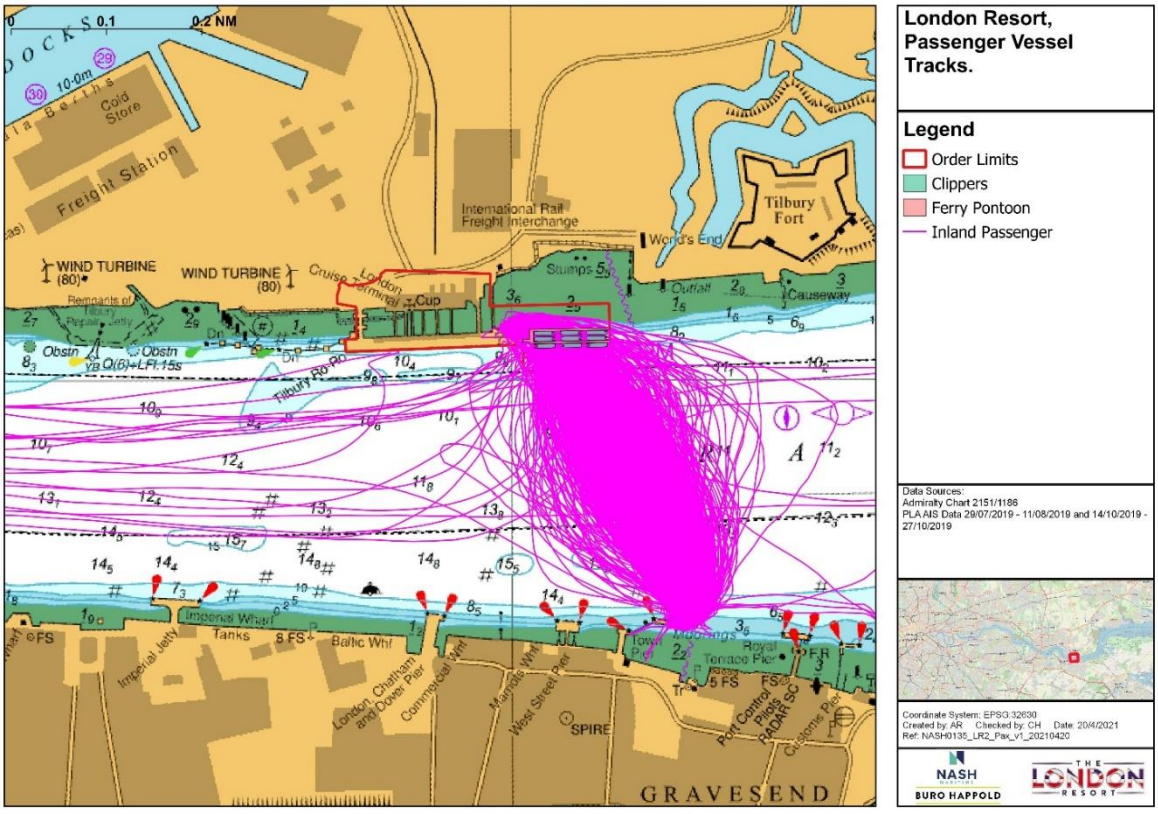


Figure 11: Initial Vessel Traffic: Inland Passenger Vessels – Essex Project Site.

Figure 11 shows high density of cross river passages created by the Tilbury to Gravesend ferry.

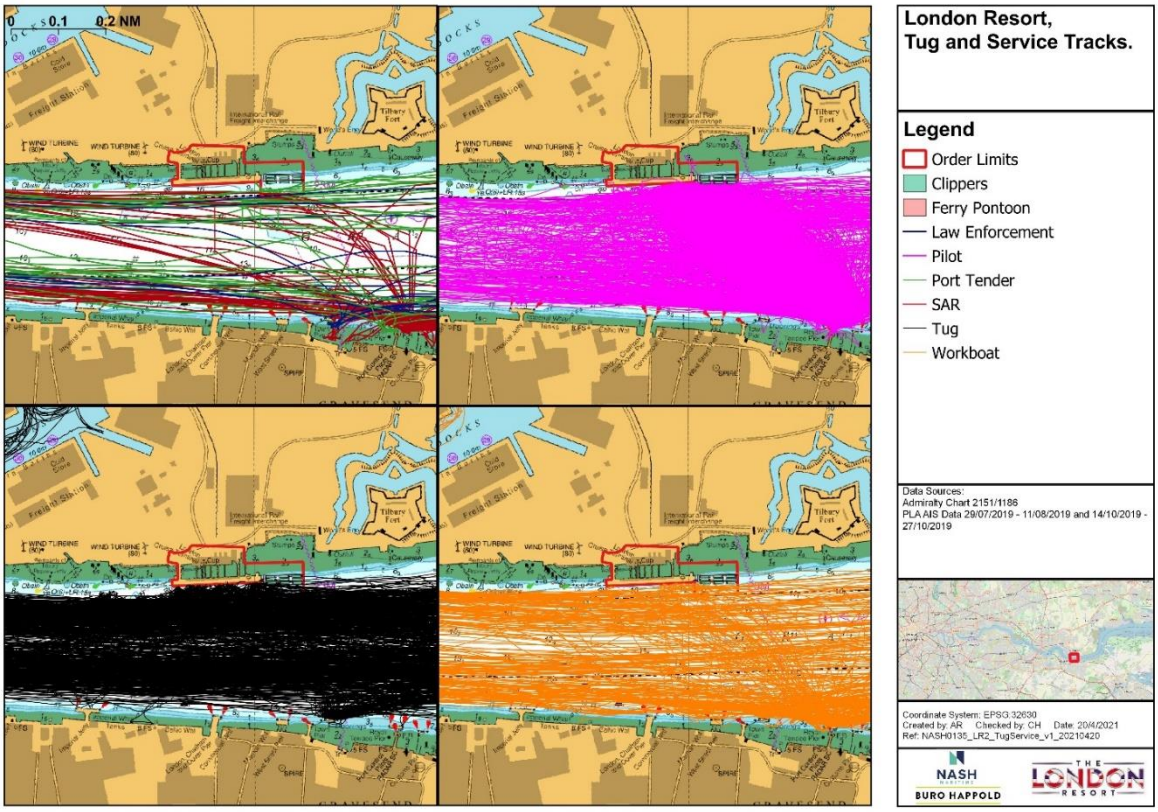


Figure 12: Initial Vessel Traffic: Tug/Service Vessels- Essex Project Site.

The tug and service vessel tracks shown in **Figure 12** illustrate the extensive use of the area by the Thames pilot vessels and tugs. Both these vessel classes show multiple vessel tracks close to and within the Order limits, as the vessels use the Tilbury Landing Stage and Cruise Terminal. Search and rescue services make frequent calls to the Port Control at the Royal Pier in Gravesend but only occasionally cross the Order Limits. Work boats and port tenders however are frequently within the Essex Project Site order limits as they progress upstream or across the river to Gravesend.

5.4. KEY NAVIGATION ISSUES

Initial navigation assessment of the proposed development (as outlined in Section 2), the outcome of previous stakeholder consultation (as outlined in Section 4.1), a review of the navigational features and the initial AIS vessel track analysis (in this section) show that navigation safety will need to be addressed as follows:

- At three locations:
    - the Essex Project Site;
    - the Kent Project Site; and
    - In the River.

- For four project phases:
    - Pre-construction;
    - During construction of Gate 1;
    - During Construction of Gate 2; and
    - Operational phase post construction of Gate 2.

A summary of the relevant activities at each site in each project phase and the key impact or hazard to be considered in assessing these activities is shown in Table 3.

Table 3 Key Issues to be addressed in assessing navigation related aspects of the project

No.	Project Phase	ACTIVITIES			Impact / Hazard
		KENT	ESSEX	RIVER	
1	Pre-Construction	Site Investigation (GI, UXO surveys)	Site Investigation (GI, UXO surveys)	Small number of additional vessel movements	Marine movements (collision, contact, grounding, breakout)
2	Construction (Gate 1)	a) Temporary in river works (sheet piling, discharge pipeline, outfalls, dredging) b) Refurbishment and construction of new jetties/pontoons c) Construction material supply d) Cranes and associated lighting (Gate 1 and river)	a) Temporary in river works (piling, dredging) b) Modification to existing and construction of new jetties/pontoons	Additional vessel movements a) Construction vessels, dredger b) Ro-Ro , materials barges, waste barges	a) Additional vessel movements (collision, contact, grounding, breakout) b) Cranes/lighting impact on navigation aids and sight lines

No.	Project Phase	ACTIVITIES			Impact / Hazard
		KENT	ESSEX	RIVER	
3	Construction (Gate 2)	a) Construction material supply b) Material supply to Gate 1 c) Waste removal from Gate 1 d) New Passenger ferry services (partial timetable)	New passenger ferry services (partial timetable)	Additional vessel movements a) Ro-Ro , materials barges, waste barges b) Passenger ferries (partial timetable)	a) Additional vessel movements (collision, contact, grounding, breakout, weather delays) b) Cranes/lighting impact on navigation sight lines c) Tall buildings/rides (Gate 1) impact on navigation aids and sight lines
4	Operations (Post Gate 2 construction)	a) Material supply Gates 1 & 2 b) Waste removal Gates 1 & 2 c) New passenger ferry services (full timetable)	New passenger ferry services (full timetable)	Additional vessel movements a) Ro-Ro , materials barges, waste barges b) Passenger ferries (partial timetable)	a) Additional vessel movements (collision, contact, grounding, breakout, weather delays) b) Tall buildings/rides (Gate 1 & 2) impact on navigation aids and sight lines

6. PRELIMINARY NRA METHODOLOGY

6.1. STUDY TASKS

The pNRA will be comprised of the following tasks:

- **Task 1: Project/Task Management and data collation.**

  Project controls and reporting systems will be required to ensure timely delivery of the assessment. A full review of the relevant previous documentation and any relevant regulatory documents and legislation will be required. Key data requirements are summarised in Section 6.5.

- **Task 2: Stakeholder Consultation / Hazard Identification and scoring workshop inputs.**

  Stakeholder consultation will be vital in informing the pNRA and consultation meetings will be held with regulators and stakeholders. As part of the pNRA consultation with the organisations identified in Section 4.2 will be required.

- **Task 3: Baseline Vessel Traffic Analysis.**

  Vessel traffic analysis is to be undertaken using AIS data covering the study area. This data will be processed into a geodatabase enabling the following analysis to be undertaken:

  - Vessel density analysis;
  - Vessel track analysis by vessel type;
  - Gate analysis near the proposed site - Analysis of gate data by vessel type, time of day, speed, etc.;
  - Swept path analysis of vessels in order to understand the geometry and sea room extent needed for various manoeuvres;
  - Analysis as necessary to investigate key issues; and
  - Analysis of historic incidents using data provided by PLA and the MAIB (Marine Accident Investigation Board).

- **Task 4: Future Vessel Traffic Analysis.**

  The project team will then develop and implement a future vessel traffic forecast and movement scenario based on the future baseline vessel traffic movements agreed with PLA.

  To support this a Marine Operations Concept Plan will be developed to provide greater definition of the project in relation to navigation issues.

  The vessel traffic forecast as informed by the Marine Operations Concept Plan will provide input to future vessel traffic modelling which will allow quantification of the impacts of the forecast project and non-project related traffic.

- **Task 5: Baseline and Construction Risk Assessment.**

  Based on the analysis conducted during Task 1, 2, 3 and 4, hazards associated with the project in the study area will be identified in consultation with PLA and the associated risk will be scored as part of a hazard scoring workshop, using the methodology outlined in Section 6.3. Appropriate risk controls will be identified, where necessary, to mitigate risk.

- **Task 6: Future Operational Scenario Risk Assessment.**

  Based on the analysis conducted during Task 3 and 4, hazards associated with the future baseline operation of the LR will be identified and the associated risk will be scored as part of a hazard scoring workshop. Appropriate risk controls will be identified where necessary to mitigate any unacceptable navigation risk.

- **Task 7: Reporting.**

  A Preliminary NRA Report will be produced and will be suitable to be included as a technical Annex to support the DCO.

6.2. PROJECT PHASES AND LOCATIONS INCLUDED IN THE RISK ASSESSMENT

As noted above, **Table 3** identifies at a high level, the key navigation hazards and issues which need to be considered in each project phase and at each project site. It is proposed that the scope of the pNRA will examine and assess a subset of the sites and project phases (see **Table 4**) using a risk-based prioritisation focusing on navigational onerous sites and project stages.

Table 4 Treatment of project phases and sites within the pNRA.

No.	Project Phase	Risk Assessment Requirements		
		Kent	Essex	River
1	Pre-Construction	To be considered as part of a separate PLA River Works Licence applications as needed.	To be considered as part of a separate PLA River Works Licence applications as needed.	Not considered to be required – except as needed (e.g., for PLA Non-Routine Towage Requirements).
2	Construction (Gate 1)	Covered by Gate 2 assessment as considered less navigationally onerous.	Included in pNRA.	Covered by Gate 2 assessment as considered less navigationally onerous.
3	Construction (Gate 2)	Included in pNRA	Covered by Gate 1 and Operations assessment as considered less navigationally onerous.	Included in pNRA
4	Operations (Post Gate 2 construction	Included in pNRA.	Included in pNRA.	Included in pNRA.

The pre-construction phase is omitted from the pNRA on the grounds that:

- The increase in vessel numbers is small,

- Details of the proposed works are not developed at this stage and;
- Any pre-construction activities will be the subject of a separate marine works licence application.

Within the construction and operation phases, a subset of the sites will be included in the pNRA, focussing on those sites/phases considered to have the greatest impact on navigational safety, based on the summary presented in **Table 3** and the detailed requirements which have emerged from stakeholder consultations as set out in **Annex D**.

Any mitigation measures developed through assessing the sub-set of phases/sites will be applied to those not directly assessed in the pNRA.

6.3. RISK ASSESSMENT MATRIX AND METHODOLOGY

The International Maritime Organization Formal Safety Assessment (FSA) methodology (see **Figure 13**) will be used and dovetailed with the risk matrix as shown in **Figure 14** in accordance with the PLA risk assessment methodology [9].

The NRA will collate quantitative vessel traffic analysis, with the qualitative input derived from consultation and the expertise of project personnel to; undertake hazard identification, hazard risk scoring, and identification of appropriate risk control measures. Hazard categories may be split by:

- Vessel types.
- Geographic/Spatial Risk Areas.
- Hazard types – e.g., collision, contact, grounding, breakout.

[9] PLA Navigational Risk Assessment - Guidance to Operators and Owners. See: [redacted] (Accessed 11-Mar-2021)

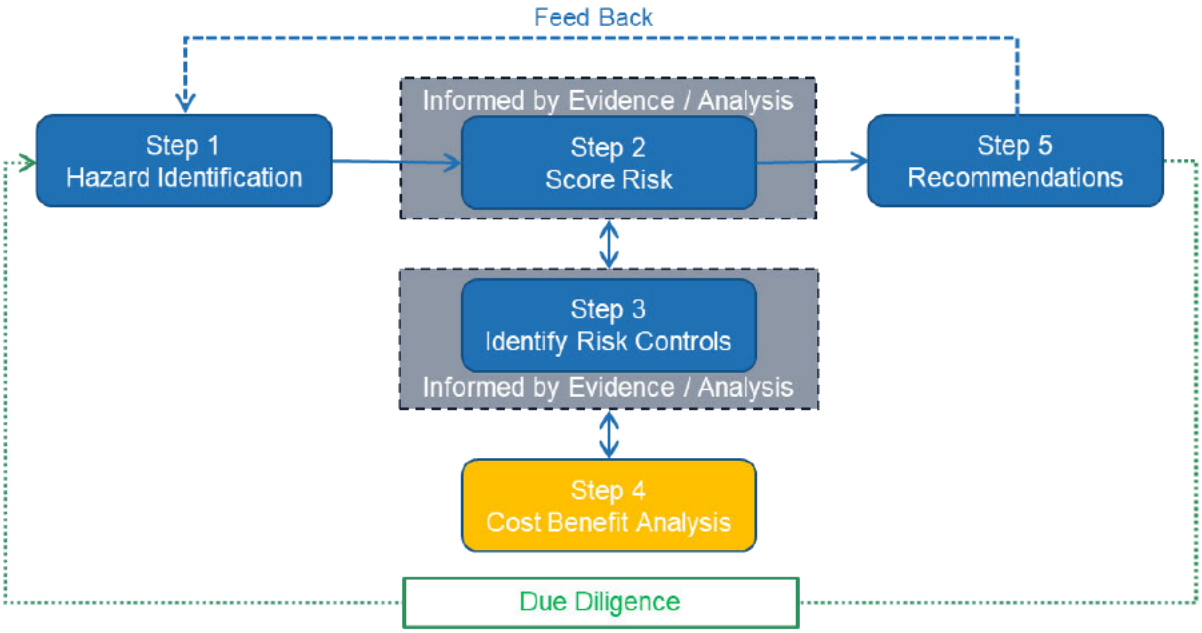


Figure 13: Formal Safety Assessment Process.

Where key or critical hazards are identified, further analysis may be required to provide an evidence basis for the assessment of risk. In many instances, key hazards or concerns are identified based on limited information, especially when there is likely to be a change in vessel traffic activity, and therefore further detailed analysis and interpretation may be used to determine the magnitude of any change or concern.

In order to ascertain the risk of individual hazard occurrence for both hazard likelihood and hazard consequence the "*Risk Assessment Matrix*" will be used (see **Figure 14**). The process of scoring hazard risk is carried out as part of a hazard workshop where hazards are individually assessed against the baseline traffic and incident data, the results of the stakeholder consultation, the expert judgement of the project team, and any detailed key hazard analysis undertaken.

Risk Score					
Almost Certain	5	10	15	20	25
Likely	4	8	12	16	20
Possible	3	6	9	12	15
Unlikely	2	4	6	8	10
Rare	1	2	3	4	5
Likelihood	**Minor**	**Moderate**	**Serious**	**Very Serious**	**Severe**

Figure 14: Risk Assessment Matrix.

Where hazards are scored as high risk, risk controls aimed at eliminating the hazard or reducing the risk to acceptable levels will be identified. Hazards scoring within the ALARP zone (As Low as Reasonably Practical) of risk acceptability will also have risk controls identified, and subject to their cost benefit these will be incorporated within the assessment. The process of risk control identification and effectiveness scoring will be documented in a hazard register.

6.4. LOCATION AND STUDY AREA

The study area for the NRA is shown in **Figure 15.** This covers the river Thames from the Queen Elizabeth Bridge west/upstream of the DCO boundary on the Kent site to Tilbury 2 east/downstream of the DCO boundary on the Essex site. This area was agreed with the PLA during meetings with BH on 5th August 2020.

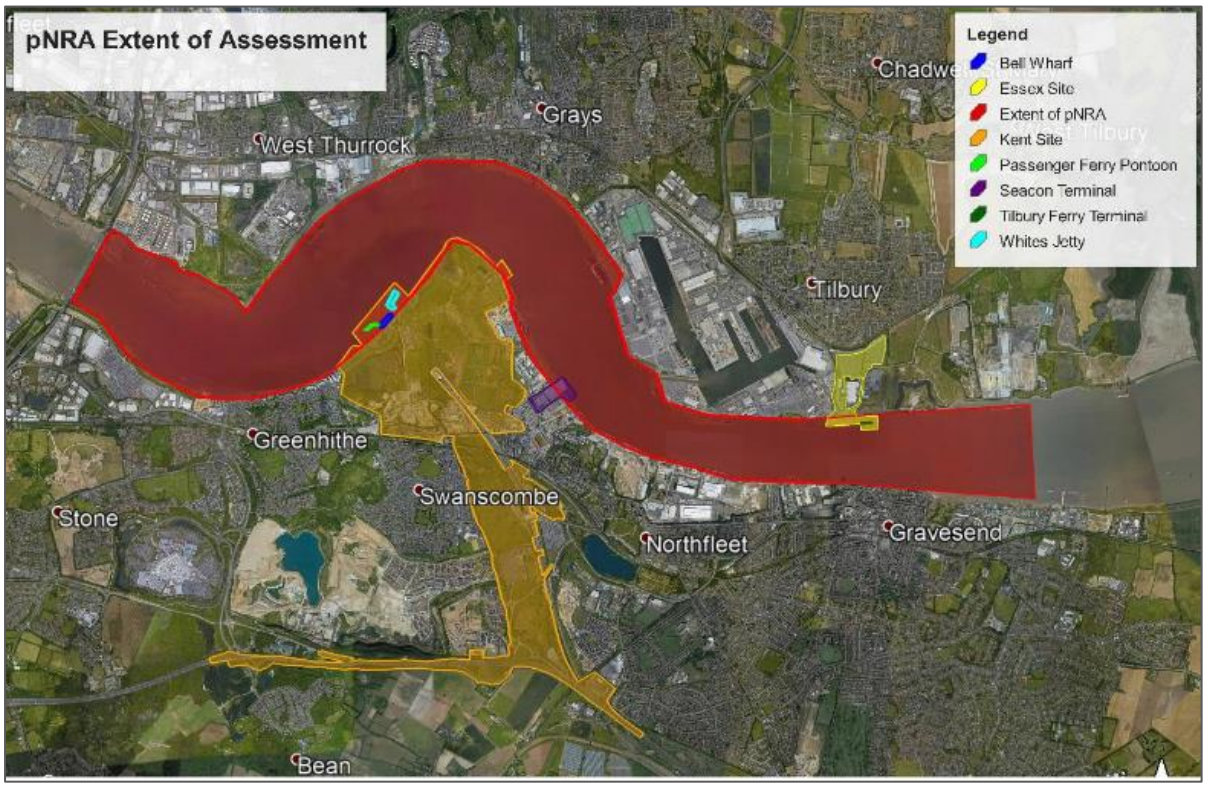


Figure 15: Study area for pNRA

6.5. DATA REQUIREMENTS

Data to be used for the pNRA are defined in the following sections.

6.5.1. PROJECT DEFINITION AND DESCRIPTION

Key elements of the LR project relevant to shipping and navigation issues are contained within the documents identified in **Table 5.**

Table 5: Key LR Project Description Documents.

Title	Document Reference	Rev	Date
Scoping Opinion Proposed London Resort Development	BC080001-000300-LNRS-Scoping Opinion COMBINED v2	-	01-Jul-20
The London Resort Environmental Impact Scoping Report	BC080001-000225-LNRS-Scoping Report part 1	-	01-Jun-20
Main Development Site PLA Thames Transit Section	042936-BUR-SK-C-0007	P01	01-Dec-20
MT Comments on Draft NRA for London Resort	201104 - MT- Comments on Draft NRA for London Resort	-	04-Nov-20
Preliminary Navigation Risk Assessment	6.2.10.1 ES Appendix 10.1 Preliminary Navigation Risk Assessment	R00	01-Dec-20
Regulation 5(2)(o) Parameter Plans	LR-PL-APT-ILP-2.19.1 - Regulation 5(2)(o) - Parameter Plans - Sheet 1	0	23-Nov-20
PLA Pylon Transit Plan	PLA Pylon Transit Plan 1_7500	-	-
Thames Clippers London Resort Operational Proposal	Thames Clippers London Resort Operational Proposal 20200702	-	02-Jul-20
DCO - Chapter 10 - River Transport	6.1.10 ES Chapter 10 - River Transport	R00	01-Dec-20
Outline Construction Method Statement	6.2.3.1 ES Appendix 3.1 Outline Construction Method Statement	R00	01-Dec-20
Draft Development Consent Order	BC080001-000361-3.1 Draft Development Consent Order	R00	01-Dec-20
Land Plans	BC080001-000341-2.2 The London Resort Development Consent Order Land Plans	0	01-Dec-20
Sections	BC080001-000343-2.4 The London Resort Development Consent Order, Sections	0	01-Dec-20
Work Plans	BC080001-000344-2.5 The London Resort Development Consent Order, Work Plans	0	01-Dec-20
Illustrative Master Plan	BC080001-000360-2.21 The London Resort Development Consent Order, Illustrative Masterplan	0	01-Dec-20
Environmental Statement Project Description	BC080001-000387-6.1.3 The London Resort Environmental Statement, Chapter Three, Project Description	0	01-Dec-20
Construction Traffic Management Plan	BC080001-000463-6.2.9.2 The London Resort Environmental Statement, Appendix 9.1 Appendix TA-AD	0	01-Dec-20
DCO Oder Limit GIS files	DCO Order Limit_A[t_201014.zip		15-Oct-20
PLA Relevant Representation (to BH pNRA)	BC080001-000840-Port of London Authority		
Response to comments on key issues	21-NASH-0135_LR_NRA_Key Issues from MT LO and resolution response		22-Apr-21

A Marine Operations Concept Plan will be developed to pull together information in the above documents and add detail necessary to better define marine operations in a clear and consistent manner for the pNRA.

6.5.2. DCO DETAILS

Relevant details from the DCO are summarised in Section 2.3 of this report.

6.5.3. VESSEL TRAFFIC DATA

AIS data (sourced from PLA VTS) covering the Thames from Queen Elizabeth Bridge to Tilbury 2 will be used. The data will cover the following periods:

- 14 days duration from Aug-2019 (0000 on Mon-29-Jul – 2359 on Sun-11-Aug inclusive).
- 14 days duration from Oct-2019 (0000 on Mon-14-Oct – 2359 on Sun-27-Oct inclusive).

These data were agreed with PLA as suitable for the pNRA, and will ensure a baseline traffic dataset which pre-dates any COVID-19 influence and considers seasonal differences. Oct-19 traffic represents a 'peak' winter vessel movement dataset so will be precautionary.

The pNRA will need to consider marine operations and vessel traffic at Tilbury2, which opened in 2020. Traffic estimates for Tilbury2 (and Tilbury3?) will be obtained from Port of Tilbury.

6.5.4. INCIDENT DATA

Historical incident data to be obtained from the PLA Incident database and reviewed/analysed.

6.5.5. LEGISLATION AND GUIDANCE

Relevant legislation and guidance is summarised in Section 3.2

6.5.6. STAKEHOLDER CONSULTATION

Previous Stakeholder consultation to be considered is summarised in Section 4.1

Additional stakeholder consultation requirements are outlined in Section 4.2

7. SCOPE SUMMARY

The NASH project team will prepare a preliminary NRA using the methodology outlined in this report. The objective and scope of the preliminary NRA has been developed in consultation with the PLA. **Table 6** summarises the objective of and topics to be covered in the NRA.

Table 6: Objective and Summary of Sub-Topics included in pNRA (- see Table 4 which identifies the specific phase and site to be assessed as part of the pNRA).*

Objective of the preliminary NRA	
To assess the impact of the proposed London Resort on safety of navigation during construction and operation in line with the PLA risk assessment methodology and to identify risk control measures which ensure that residual risk levels are acceptable.	
Topics/Sub-topics covered in/excluded from the preliminary NRA	
Sub- Topic	**Rationale for inclusion**
Data /Information collation	
Project information	To include relevant previous work and changes (e.g. DCO, DML)
AIS & Incident data	As fundamental basis for vessel traffic assessment
Marine Operation Concept Plan	To provide a single source of information for all project related marine activities envisaged throughout project development.
pNRA per requirements of PLA	To address concerns raised by PLA in review of previous pNRA.
Stakeholder consultation	To identify stakeholder navigation concerns/issues.
Baseline Vessel Traffic Analysis	To establish vessel traffic characteristics/features without the project.
Future Vessel Traffic Modelling	To provide quantitative forecast of future traffic collisions/ground risk to support risk assessment.
Future Vessel Traffic Analysis	Assessment of the above.
Risk Assessment*	
Baseline	To establish current navigation risk and risk controls within the study area.
Construction Gate 1 Phase	To assess navigation risk in first construction phase when marine structures are being installed/improved.
Construction Gate 2 Phase	To assess navigation risk in second construction phase when visitors are also arriving/departing by ferries.
Operations Phase	To assess navigation risk when passenger ferries and visitor numbers peak but there are no construction vessel movements.
Kent Project Site	To assess navigation risk for several new marine structures to be installed and a site for construction and operational vessels.
Essex Project Site	To assess navigation risk for new marine structure to be installed at already busy facility, including ferry operations.
River	To assess navigation risk for already heavily trafficked part of the Thames into which a significant number of vessel movements will be added.
Risk control/mitigation identification	To provide the project, PLA and other relevant stakeholders with a mechanism to manage risk to an acceptable level.

ANNEX A – DCO SECTIONS RELEVANT TO SHIPPING AND NAVIGATION

The London Resort Development Consent Order 202[ ]				
Sections with relevance to shipping and navigation with ref to Preliminary Navigation Risk Assessment				
Section	**Title**	**Article / Para**	**Relevant Text**	**Relevance /Summary**
PART 4	**SUPPLEMENTAL POWERS**			
18	Discharge of water	Para 18	—(1) Subject to sub-paragraphs (3) and (4) the undertaker may use any watercourse or any public sewer or drain for the drainage of water in connection with the carrying out or maintenance or use of the authorised development and for that purpose may lay down, take up and alter pipes and may, on any land within the Order limits, make openings into, and connections with, the watercourse, public sewer or drain.	Permits construction and use of waste water outfall(s) discharging into the Thames
19	Protective work to buildings	Para 19	—(1) Subject to the following provisions of this article, the undertaker may at its own expense carry out such protective works to any building lying within the Order limits as the undertaker considers necessary or expedient.	Permits protective works to jetties, wharves etc
20	Authority to survey and investigate the land	Para 20	(1) The undertaker may for the purposes of this Order enter on any land shown within the Order limits or which may be affected by the authorised development or upon which entry is required in order to carry out monitoring or surveys in respect of the authorised development and— (a) survey or investigate the land; (b) without limitation on the scope of sub-paragraph (a), make any excavations, trial holes, bore holes and other investigations on the land in such positions as the undertaker thinks fit to investigate the extent or nature of the surface layer ground water, underground structures, foundations, plant, apparatus and subsoil, and remove soil and water samples and discharge water from sampling operations on to the land; (c) without limitation on the scope of sub-paragraph (a), carry out ecological or archaeological investigations on such land, including making any excavations or trial	Permits marine geotechnical investigations

			holes on the land for such purposes; and (d) place on, leave on and remove from the land apparatus for use in connection with the survey and investigation of land and making of trial holes and bore holes ..... (5) No trial holes are to be made under this article within the river Thames without the consent of the PLA, but such consent must not be unreasonably withheld or delayed	
PART 6	**MISCELLANEOUS AND GENERAL**			
36	Protective Provisions	Para 36	Schedule 10 (protective provisions) has effect	
37	Crown rights	Para 37	—(1) Nothing in this Order affects prejudicially any estate, right, power, privilege, authority or exemption of the Crown and, in particular, nothing in this Order authorises the undertaker or any licensee to take, use, enter on or in any manner interfere with any land or rights of any description (including any part of the shore or bed of the sea or any river, channel, creek, bay or estuary) belonging to— (a) Her Majesty in right of the Crown and forming part of the Crown Estate without the consent in writing of the Crown Estate Commissioners; or (b) Her Majesty in right of the Crown and not forming part of the Crown Estate without the consent in writing of the government department having the management of that land; or (c) a government department or held in trust for Her Majesty for the purposes of a government department without the consent in writing of that government department. (2) Paragraph (1) does not apply to the exercise of any right under this Order for the compulsory acquisition of an interest in any Crown land (as defined in the 2008 Act) which is for the time being held otherwise than by or on behalf of the Crown. (3) Consent under paragraph (1) may be given unconditionally or subject to terms and	Requires consent from Crown Estate for activates on its estate -(below MHW)

			conditions, and is deemed to have been given in writing where it is sent electronically.	
38	Deemed Marine Licence	Para 38	. The undertaker is deemed to have been granted the licence to carry out the works and make the deposits described in Schedule 11 (deemed marine licence) to this Order, subject to the licence conditions which are deemed to have been attached to the licence by the Secretary of State under Part 4 of the 2009 Act	Marine licence is deemed to have been issued per Schedule 11

39	Temporary closure of, and works in, the river Thames	Para 39	—(1) Subject to the provisions in this article, the undertaker may, in connection with the construction of the authorised development temporarily interfere with the relevant part of the river. (2) Without limitation on the powers conferred by paragraph (1) but subject to paragraphs (3) and (4) the undertaker may, in connection with the construction, maintenance and operation of the authorised development— (a) temporarily moor or anchor barges or other vessels or craft in the relevant part of the river and may load or unload into and from such barges, other vessels or craft equipment, machinery, soil and any other materials in connection with the construction of the authorised development; (b) temporarily alter, interfere with, occupy and use the banks, bed, foreshores, waters and walls of a relevant navigation or watercourse; (c) construct, place, maintain and remove temporary works and structures within the banks, bed, foreshores, waters and walls of a relevant navigation or watercourse; (d) interfere with the navigation of any relevant navigation or watercourse; and (e) on grounds of health and safety only, temporarily close to navigation the relevant part of the river. (3) During the period of any closure referred to in paragraph (2)(e), all rights of navigation and other rights relating to, and any obligations of the PLA to manage the relevant part of the river so closed must be suspended and unenforceable against the PLA. (4) The power conferred by paragraphs (1) and (2) must be exercised in such a way which	Wide ranging powers to temporarily modify foreshore, banks and bed of the river Thames and interfere with navigation. Excludes PLA from exercising its rights and obligations or granting works licences (in specified areas) during the temporary period

			secures— (a) that no more of the relevant part of the river is closed to navigation at any time than is necessary in the circumstances; and (b) that, if complete closure to navigation of the relevant part of the river becomes necessary, all reasonable steps are taken to secure that the period of closure is kept to a minimum and that the minimum obstruction, delay or interference is caused to vessels or craft which may be using or intending to use the part so closed. (5) Any person who suffers loss as a result of the suspension of any private right of navigation under this article is entitled to be paid compensation for such loss by the undertaker, to be determined, in case of dispute, under Part 1 (determination of questions of disputed compensation) of the 1961 Act. (6) The PLA must not carry out any activities or grant a works licence over the land shown on the access, rights of way and public rights of navigation plans without the consent of the undertaker, such consent not to be unreasonably withheld or delayed. (7) In this article, "the relevant part of the river" means so much of the river Thames as is shown hatched on the access, rights of way and public rights of navigation plans.	
49	Amendment of local legislation	Para 49	—(1) The following local enactments and local byelaws or other provisions made under any of those enactments or byelaws, are hereby excluded and do not apply insofar as inconsistent with a provision, of or a power conferred by, this Order— ….. (l) Port of London Thames Byelaws 2012; and (m) The Port of Tilbury (Expansion) Order 2019(m).	Suspends PLA byelaws 2012 and Port of Tilbury (Expansion) Order 2019(m)

50	Byelaws	Para 50	50.—(1) The undertaker may from time to time make byelaws for the efficient management and good rule and government of the whole or any part of the authorised development and for the prevention and suppression of nuisances in the authorised development. .... (3) Without limitation on the scope of paragraph (1) byelaws made under this article may provide for ..... (e) temporarily regulating within the river Thames adjacent to the authorised development the use of yachts, sailing boats, sailboards, rowing boats, rowing punts, pleasure craft and other small craft; (f) regulating or prohibiting the activities within the river Thames adjacent to the authorised development of divers, surfers, water skiers and other persons engaged in similar recreational pursuits but not so as to prohibit the use for navigation of the vessels referred to in sub-paragraph (e);	Permits undertaker to make byelaws temporarily regulating the river Thames adjacent to the development
SCHEDULES				
SCHEDULE 1	AUTHORISED DEVELOPMENT			

PART 1	NATIONALLY SIGNIFICANT INFRASTRUCTURE PROJECT		The authorised development comprises of a nationally significant infrastructure project which, in accordance with a direction made by the Secretary of State under section 35 of the 2008 Act on 9th May 2014, is development for which development consent is required; and associated development as defined in section 115(2) of the 2008 Act, comprising as follows— …. Work No. 14a — The construction of roll-on roll-off and barge unloading and loading facilities and enhancement works on the existing wharf (Bell Wharf), refurbishment of White's Jetty, dredging adjacent to Bell Wharf, the construction of warehouse services and infrastructure buildings including waste-water pumping station, and waste transfer facilities and the safeguarding and diversion of underground utility connections in that area. ….. Work No. 15 — The construction of a river boat terminal and floating pontoon on the south side of the river Thames including dredging adjacent to Bell Wharf, temporary outfalls, barge berth and access ramp, and the creation of salt marshes. Work No. 16 — Works to the existing Tilbury Riverside Terminal including ticketing, luggage storage, food, beverage and catering facilities, the creation of pedestrian routes and landscaped amenity areas, a surface outfall within the existing river wall and a floating pontoon and flood defence works on the north side of the river Thames. ….. Other relevant works …. (e) water supply works, drainage provision, pumping stations and surface water management systems including sustainable drainage systems, attenuation, culverting and outfalls into the river; (f) aids to navigation;	Permits the marine jetty/wharf developments and wastewater outfall construction and installation of aids to navigation

SCHEDULE 2	REQUIREMENTS			
PART 1	REQUIREMENTS			
	Navigational risk	Para 19	—(1) No phase of the authorised development is to commence until a navigational risk assessment for that phase, substantially in the form of the draft navigational risk assessment (application reference 6.2.10.1) has been submitted to and approved in writing by the PLA, following consultation with the Port of Tilbury London Ltd and the MMO. (2) The authorised development must be carried out in accordance with the navigational risk assessment referred to in sub-paragraph (1).	Places a requirement for further NRAs prior to commencement of work, based on the draft (preliminary) NRA
SCHEDULE 10	**PROTECTIVE PROVISIONS**		None relevant to navigation safety	No protective provisions for PLA
SCHEDULE 11	**DEEMED MARINE LICENCE**	**Article 38**		
	PART 2 LICENSED MARINE ACTIVITIES	Para 3	3. Subject to the licence conditions in Part 4 of this licence, this licence authorises the undertaker to carry out any licensable marine activities under sections 66(1) and 66(7) of the 2009 Act which involve the construction, alteration or improvement of any works, including dredging or scour protection works, in or over the River or on or under the bed of the River and which— (a) form part of, or are related to, the authorised development; and (b) are not exempt from requiring a marine licence by virtue of any provision made under section 74 of the 2009 Act.	Defines where DML applies

		Para 5	—(1) In this licence, "licensed marine activity" means the construction, maintenance and operation of those parts of each of the following numbered works within the limits of deviation to the extent that such works constitute licensable marine activities, as shown on the works plans— (a) within the limit of deviation for Work No. 15, the construction of a floating pontoon with linkspan on the river Thames on the south-western side of the Swanscombe peninsula comprising— (i) the construction of associated restraint structures; (ii) installation of the floating pontoon; and (iii) the installation of a linkspan bridge between the floating pontoon and the shoreline; (b) within the limit of deviation for Work No. 16, construction of a floating pontoon with linkspan on the north side of the river Thames comprising— (i) the construction of associated restraint structures; (ii) the installation of the floating pontoon; and (iii) the installation of a linkspan bridge between the floating pontoon and the existing Tilbury Riverside Terminal; (c) within the limit of deviation for Work No. 15, alteration works to Bell Wharf, which may include— (i) new casting of reinforced concrete structures; (ii) shot-blasting, plating and painting; (iii) the installation of additional piles and superstructure to strengthen the structures; and (iv) the construction of a temporary coffer dam to enable dewatering, if required; (d) the construction of a number of outfall structures including— (i) surface water outfalls at a number of locations around the Swanscombe Peninsula; (ii) a surface outfall within the existing river wall at Tilbury Riverside Terminal; (iii) within the limit of deviation for Work No. 14c, an outfall from the new waste water	Permits development of all proposed marine structures described in the environmental Statement, but allows only one of the three options described for Kent Project Site to be selected

			treatment facility on the Swanscombe Peninsula, if required; (iv) a new treated leachate outfall from the leachate treatment facility, if required; (v) each outfall will incorporate appropriate tidal flap valves and scour protection; and (vi) the construction of a temporary coffer dam to enable dewatering, if required; (e) the creation of the Saltmarsh habitat comprising— (i) the excavation of land above the current Mean High Water Spring line to create a series of embayments, the excavation works to be undertaken from land; and (ii) the creation of inlets between the existing saltmarsh habitats and the new embayments to allow tidal flow in and out of saltmarsh; (f) either within the limit of deviation for Work No. 14a, the construction of a roll on roll off facility on the river Thames on the north-western side of the Swanscombe Peninsula comprising— (i) the construction of associated restraint structures; (ii) installation of the floating pontoon; (iii) installation of the linkspan; and (iv) the construction of a fixed bridge structure between the linkspan and the shoreline; or (g) within the limit of deviation for Work No. 14a, alteration works to refurbish and repair White's Jetty, which may include— (i) new casting of reinforced concrete structures; (ii) shot-blasting, plating and painting; (iii) the installation of additional piles and superstructure to strengthen the structures; and (iv) the construction of a temporary coffer dam to enable dewatering, if required; or (h) within the limit of deviation for Work No. 15, dredging works at Bell Wharf, which may include, a capital dredge in the area immediately in front of Bell Wharf, to allow vessel access throughout the tidal cycle; (i) within the limits of deviation for Works Nos. 14a, 14c, 15 and 16, such other works	

			as may be necessary or convenient for the purposes of, or in connection with or in consequence of, the construction, maintenance, operation or use of the authorised development, namely— (i) works to divert, remove or replace apparatus, including mains, sewers, drains, pipes, conduits, cables, electrical substations and electrical lines; and (ii) landscaping and other works to mitigate any adverse effect of the construction, maintenance and operation of the works or to benefit or protect any person or premises affected by the construction, maintenance and operation of the works; and (iii) installation of berthing and mooring facilities, ladders, buoys, bollards, dolphins, fenders, rubbing strips and fender panels, fender units and pontoons. (2) Only one of licensable marine activities (1)(f), (g) or (h) may be constructed.	
	PART 4 CONDITIONS			
	Notification of commencement and completion of licensed activities	Para 7	7.—(1) The MMO local office must be notified of the commencement of the first instance of any licensed activity at least 5 working days prior to the commencement of that licensed activity. (2) The MMO local office must be notified of the completion of the licensed activities within 10 working days of such completion. (3) The Source Data Receipt team (UK Hydrographic Office, Taunton, Somerset, TA1 2DN; sdr@ukho.gov.uk) must be notified of the completion of the licensed activities within 2 weeks of the date of completion of the licensed activities. (4) A copy of the notification required under sub-paragraph (3) must be sent to the MMO Marine Licensing Team within 1 week of issue. (5) A notice to	Requires MMO notification prior to commencement of works

			mariners must be issued at least 10 working days prior to the commencement of the licensed activities, or any part of them, advising of the start date and the expected vessel routes from the local construction ports to the relevant location. (6) Except in case of emergency, the MMO local office must be notified of the date of commencement and anticipated duration of any temporary closure of any part of the River under the powers conferred by articles 31(13) (temporary use of land for carrying out the authorised development) or 39(2)(e) (temporary closure of, and works in, the river Thames) of the Order at least 10 working days prior to any such temporary closure.	
	Vessels	Para 11	1.—(1) The MMO Marine Licensing Team must be notified of any vessel being used to carry on any licensed activities. (2) A notification under sub-paragraph (1) must— (a) be received by the MMO Marine Licensing Team no less than 24 hours before the commencement of the relevant licensed activity; (b) include the name of the master of the vessel, the vessel type, the vessel IMO number and details of the vessel owner or operating company. 88 (3) A copy of this licence and any subsequent revisions or amendments must have been read and understood by the master of any vessel being used to carry on any licensed activities, and a copy of this licence must be held on board any such vessel.	Requires MMO notification of vessels to be used in the works
SCHEDULE 15	**DOCUMENTS TO BE CERTIFIED**	**Article 2**	Draft Navigational Risk Assessment – Regulation5(2)(o)	Requires a NRA be submitted with the DCO

ANNEX B – ES SCOPING COMMENTS AND RESPONSE

Extract From

The London Resort Development Consent Order, Environmental Statement Volume 1: Main Statement, Chapter 10 – River Transport, Doc Ref 6.1.10, Dec 2020

Table 10.1: Table of relevant advice from EIA scoping opinion

Respondent	Scoping Comment	Response
Secretary of State – scoping advice	It is noted that the ES will contain a separate chapter on river transport. The Scoping Report only considers the potential impacts during the construction period but makes no reference to any impacts resulting from the operational period. There is no explanation as to why the operational period has not been considered. The ES must either present an assessment of the impacts during operation or evidence demonstrating agreement with the relevant consultation bodies and the absence of an LSE.	The effects and potential impacts of the London Resort's river transport during both the construction and operational periods have been considered in this chapter of the ES.

Respondent	Scoping Comment	Response
Gravesham Borough Council	Ferry service improvements (para 9.17/18) including link to Tilbury, combined with a service from central London are mentioned, along with the car parking proposal in Tilbury. All this is to be welcomed in principle. Thames Clippers have run a trial service from Gravesend and a holistic approach to service provision is required. However, allied with this is the future of the Tilbury Ferry as part of enhancing cross river public transport opportunities. This is the only current public transport link across the river downstream of the Dartford Crossing and it is very important that it is retained and not lost.	The navigational interaction of the proposed ferry services and the existing Tilbury-Gravesend Ferry is considered in this ES Chapter (see paragraph 10.93) and the pNRA (Appendix 10.1 of this ES - document reference 6.2.10.1). Additionally, LRCH has met with POTLL and Jetstream and have confirmed Jetstreams operation will not be compromised. As the new ferry operations have been developed to cater primarily for London Resort visitors it is considered that they will not have a material commercial impact on the existing Tilbury/Gravesend ferry, which caters for a different customer base
Kent County Council	The Scoping Report states that 95% of construction materials are proposed to be supplied to the site by river. This is welcomed as it will take a large number of trips off the highway network. A Construction Management Plan will be required and with regards to river transport, and this must demonstrate that 95% is achievable. Whilst the Scoping Report assumes that the construction traffic will be significantly lower than development traffic, the two types of traffic are likely to have different peak periods which could coincide with the network peak hours. Construction traffic should, therefore, be considered.	River-based construction traffic has been considered as part of the Construction Traffic Management Plan (document reference 6.2.9.1) and in this chapter of the ES. Following further assessment of the likely construction method the proposals were revised to80% of construction materials can be supplied to the site via river. This ES Chapter considers the impacts of this level of movements (See paragraph 10.73).
Port of London Authority	The Applicant recognises that a Navigational Risk Assessment (NRA) is required to support the project and discussions on the scope of the NRA, consultation requirements and potential impacts and mitigations should be held with the PLA.	Consultation meetings have been held with Port of London Authority, first in November 2017 and subsequently in August 2020, to agree the extent and scope of the pNRA (document reference 6.2.10.1).

Respondent	Scoping Comment	Response
		Transport Assessment (Appendix 9.1 of this ES - document reference 6.2.9.1).
Highways England	As indicated by the LTC team, no reference has been made to the PoT2 and likely impacts of construction or linkages. Any further consideration of river methodology and documents has not been undertaken.	This has been assessed and reviewed in more detail in Sections 13 and 16 of the Transport Assessment (Appendix 9.1 of this ES – document reference 6.2.91).
LTC Via Highways England	There may also be increased maritime traffic which could impact LTC if the jetty were to be used.	Increases in marine traffic and their potential impacts are considered in this chapter of the the ES and the pNRA (Appendix 10.1 of this ES- document reference 6.2.10.1)).
LTC Via Highways England	Para 9.30. does not take account of the known (LTC has to include it) fog/visibility issues and how this may affect the cross-river ferry for passengers and logistics, i.e. it can be reasonably be assumed the service will be suspended and visitors will be obliged to cross the river at Dartford if they continue their journey to the resort. For logistics, materials would either be delayed or travel via Dartford.	This has been reviewed and assessed in Section 11 of the Transport Assessment (Appendix 9.1 of this ES - document reference 6.2.9.1)).
LTC via Highways England	15% of arrivals by river from Central London appear high given the likely long journey time.	The inclusion of the river service is seen as part of the day trip to the resort, this is considered in more detail in Section 8 of the Transport Assessment (Appendix 9.1 of this ES - document reference 6.2.9.1).

Respondent	Scoping Comment	Response
	passengers, the Thames is a busy operational river, and increased vessels will have an impact on a wide variety of environmental factors, including busier shipping lanes. Any potential increase in large sea vessels/cruise ships will impact Thurrock, as it would be expected these to dock at the Port of Tilbury, and there is an impact on air quality on the local community.	and existing vessel movements. LRCH are not proposing any additional large sea vessels or cruise ship services as part of the access strategy.
Transport for London	If, as set out in paragraph 4.53, 15% of all visitors travelling by river from central London, the potential impact of this on crowding at and onward travel from central London river piers would need to be assessed. However, notwithstanding any attraction the river trip itself will have, given the extended journey times from central London (or indeed even the closer piers such as Woolwich, itself one hour distant by riverbus from there), it is not clear how attractive this will be to the majority of visitors to the proposed development.	The inclusion of the river service is seen as part of the day trip to the resort, this is considered in more detail in Sections 5, 8 and 11 of the Transport Assessment (Appendix 9.1 of this ES - document reference 6.2.9.1).
Transport for London	The proposal to deliver 95% of all construction materials by river (paragraph 4.53) and suggestion that this will also be used for operational waste (paragraph 5.72) are fully supported. However, the ultimate proposals must include details of how these objectives will be achieved.	River-based construction traffic has been considered in Section 16 of the Transport Assessment (Appendix 9.1 of this ES – document reference 6.2.91). Following further assessment of the likely construction method the proposals were revised to 80% of construction materials to be delivered by river.
Highways England	Does not specifically mention the existing conditions associated with the ferry trips which would be needed to understand future movement needs and demand.	New local ferry services will be provided. The new services will not affect the conditions of the existing Gravesend to Tilbury Ferry, so the Proposals are not considered to have an impact on existing services. Details of the principle of the proposed ferry operations are set out in Section 11 of the

Respondent	Scoping Comment	Response
Thurrock Council	It is noted that the Scoping Assessment makes reference to the current Tilbury Ferry and that it is unlikely that the new proposals will impact on the existing ferry service. However further clarification will be required in this respect. It is also well known that on certain occasions the Tilbury Ferry is unable to run due to fog, exceptionally low tides, adverse weather conditions etcetera. Thus the applicant will need to consider what contingencies will be necessary in this respect and in addition what contingencies will be in place for breakdowns or servicing of vehicles etcetera.	The navigational interaction of the proposed ferry services and the existing Tilbury-Gravesend Ferry is considered in this ES River Chapter (para 10.93) and the pNRA (Appendix 10.1 of this ES - document reference 6.2.10.1). Additionally, LRCH has met with POTLL and Jetstream and have confirmed Jetstreams operation will not be compromised. Contingencies in the event of an inability for vessels to sail is considered in Section 11 of the Transport Assessment (Appendix 9.1 of this ES, document reference 6.2.9.1).
Thurrock Council	Concerns remain as to the impact on the viability of the existing Gravesend to Tilbury ferry once this development is operation, and would there be an impact on its long-term future. The ferry provides the only non-motorised link across the river outside of London and coupled with the heritage and tradition of the ferry, the authority believe it essential that the service is not lost.	The navigational interaction of the proposed ferry services and the existing Tilbury-Gravesend Ferry is considered in the ES River Chapter (para 10.93) and the pNRA (Appendix 10.1 of this ES - (document reference 6.2.10.1). As the new ferry operations have been developed to cater primarily for London Resort visitors it is considered that they will not have a material commercial impact on the existing Tilbury/Gravesend ferry which caters for a different customer base. Additionally, LRCH has met with POTLL and Jetstream and have confirmed Jetstreams operation will not be compromised.
Thurrock Council	It is noted in the chapter that analysis has not been undertaken on the impact of ferry movements on the wider network, as well as impact of passenger movements by sea and air. In terms of river and sea	The impacts of the proposed ferry operations have been assessed in this chapter of the ES, this includes an assessment of the interaction between new

Respondent	Scoping Comment	Response
		Assessment (Appendix 9.1 of this ES- document reference 6.2.9.1) sets out a demand management plan which looks to encourage visitors and staff by sustainable modes of travel, including river vessels.
Port of London Authority	It is noted that the applicant proposes to scope out sea-related (as opposed to river-related) water traffic from the assessment but that more cruise visitors are expected. The scoping out of sea related water traffic should therefore be justified.	Chapter 9: Land transport of the ES (document reference 6.1.9) discusses this in further detail. However, the introduction of the London Resort is not expected to see any increases in cruise ships into Tilbury and the London Resort are not looking to increase facilities for Cruise ships at Tilbury. For those cruise ships that already berth at Tilbury, there will be the opportunity for passengers to visit London Resort.
Port of London Authority	Robust modelling should support the proposed river transport figures and if achieved then almost one million visitors could be arriving at the application site by water for gate 1 or nearly two million across both gates one and two.	The trip generation, distribution and mode choice is assessed in detail in the Transport Assessment (Appendix 9.1 of this ES - (document reference 6.2.9.1).
Port of Tilbury London	PoTLL support the approach of having a separate chapter in the ES to consider the effects of river transport. Detailed consideration will need to be given to the impact on navigation from marine infrastructure both during the construction and operation of the Resort and the river services both from London and from Tilbury itself. The transfer of construction materials between Tilbury and the Resort will need to be assessed carefully to ensure that there is no adverse effect on Port operations albeit PoTLL, in supporting the initiatives of LRCH to use the Port of Tilbury as a construction hub, will work with LRCH and PLA to ensure no adverse effects arise.	A number of consultation meetings have been held with Port of Tilbury London Limited (POTLL) and they participated in the pNRA preparation workshop held on 6 October 2020. LRCH has continued to engage with POTLL.

Respondent	Scoping Comment	Response
		Port of London were participants in the pNRA preparation workshop held on 6 October 2020.
Port of London Authority	It is proposed to use the river for the transport of passengers to the site through the addition of a new floating pontoon jetty which is proposed between Bell's Wharf and Ingress park. An extension is proposed to an existing jetty at the Port of Tilbury and there will be a mooring area for vessels in the immediate vicinity of the jetty extension. Services are proposed between the application site and central London as well as from Tilbury and potentially from Grays, although no further details are given on the Grays river transport options.	LRCH's transport strategy does not rely on jetty at Grays and it therefore has not been included within the DCO application or assessed as part of the ES. However, Thurrock Council and Grays Town Board are undertaken a feasibility assessment with the aim to fund and develop a pier at Grays. LRCH has signed an MOU with Thurrock Council and has agreed to support the council with its proposals which would form a separate planning application should it be progressed.
Port of London Authority	Initial estimates are 25% of car borne visitors will travel to the Resort via Tilbury and approximately 2,500 spaces would be provided at Tilbury. As such, the anticipated percentage of visitors that will arrive at the resort by water from North of the River should be clarified.	The level of visitors arriving at the London Resort by car is set out in detail in sections 6 and 8 of the Transport Assessment (Appendix 9.1 of this ES - document reference 6.2.9.1)
Port of London Authority	Consideration should also be given to the potential to use the river for the transport of construction workers to the site and for staff to be transported to the site during the operation of the resort. The measures that will be taken to encourage visitors to arrive by water should be clearly set out.	An assessment of the level of construction workers using ferry services to transfer between Tilbury and the London Resort has been undertaken and is included in the Transport Assessment (Appendix 9.1 of this ES - document reference 6.2.9.1) and in the Construction Traffic Management Plan (document reference 6.2.9.1). The potential vessel movements associated with these operations is considered in this chapter of the ES. Furthermore, the Transport

ANNEX C - RELEVANT RESPONSES TO NAVIGATION ISSUES IN 2020 STATUTORY CONSULTATION

Extract From

The London Resort Development Consent Order, Environmental Statement Volume 1: Main Statement, Chapter 10 – River Transport, Doc Ref 6.1.10, Dec 2020

Table 10.3: Table of relevant responses to the 2020 statutory consultation

Consultee	Relevant Response	Consideration in ES
Gravesham Borough Council	It is important that the Tilbury Ferry (Tilbury to Gravesend Town Pier) be retained and enhanced as a basis for making much better use of the river for local transport and strengthen north – south connections. The statement at para 10.61 is welcomed, however the	The navigational interaction of the proposed ferry services and the existing Tilbury-Gravesend Ferry is considered in this ES River Chapter (para 10.93 and the pNRA (Appendix 10.1 of the

	development boundary covers the entire Tilbury landing stage. Gravesham owns the Town Pier and Pontoon and is keen to see greater use of these to support the economic regeneration of Gravesend Town Centre.	ES - document reference 6.2.10.1). Additionally, LRCH has met with POTLL and Jetstream and have agreed to safeguard Jetstream's existing operation.
Gravesham Borough Council	There are, in effect, two river transport markets. A long distance (Thames Clipper) service for Resort visitors and also commuters into London. There is also what might be termed a local market for resort, employment, school, etc. traffic between Swanscombe Peninsula, Grays (as a potential ferry destination not mentioned in PEIR), Tilbury and Gravesend, and possibly other destinations.	The navigational interaction of the proposed ferry services and the existing Tilbury-Gravesend Ferry is considered in the ES River Chapter (para 10.93) and the pNRA (Appendix 10.1 of the ES – document reference 6.2.10.1). Ferry services from Grays are not proposed in the current DCO application.
Gravesham Borough Council	The river is proposed to be used for bringing in materials as well as supplies / waste during operation. The Borough Council welcomes this as a general principal but will need to see more detail as to the actual implications and practicality . For example during construction it would be illogical for goods / lorry movements coming from south of the river to travel north of the river only to come back again by water Options for the use of rail can also be explored given the availability of existing rail freight sidings at Northfleet.	River-based construction traffic has been considered as part of the Construction Management Plan and Construction Traffic Management Plan (document reference 6.2.9.2) and the ES. It is agreed that goods movements from the south east of London would be better served accessing the Resort from the Kent side.
DPWorld London Gateway	We are of the view that the proposed ferry terminal on the north banks of the River Thames in Tilbury does not promote the use of sustainable transport by visitors to the London Resort or a material reduction in visitor related road vehicle mileage.	The Transport Assessment (Appendix 9.1 of this ES - document reference 6.2.9.1) considers the sustainability of the site in greater detail. The inclusion of the car park and ferry terminal at Tilbury is considered beneficial by removing the requirement for car and coach borne visitors to use the Thames crossing at Dartford and travelling on the A2(T).

ANNEX D KEY ISSUES RAISED IN STAKEHOLDER CONSULTATION IN 2020/2021

Key Issues to be included - based on MT comments on BH Draft NRA and LO email 11 Jan 2021 and 10 May 2021

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
General				
1	1.2 "Objective of assessment is to establish whether the proposed river operations can be undertaken alongside other known or committed river traffic" – why is it not addressing the impact of the development as a whole on navigation e.g. sight lines and impact on existing navigational equipment?	From Executive Summary The objective of this Navigation Risk Assessment (NRA) is to assess the impact and mitigate the risks associated with the Proposed Development on navigation in the River Thames. The NRA seeks to establish whether the proposed operations on the River Thames can be undertaken safely alongside other known or committed river traffic, and to assess the potential impact of the project on river navigation as whole, such as impacts on sightlines and navigational aids. The assessment takes account of existing navigation control measures and identifies any additional measures that are		6. Scope Summary to define objective as "To assess the impact of the proposed London Resort on safety of navigation during construction and operation in line with the PLA risk assessment methodology and to identify risk control measures which ensure that residual risks are acceptable."

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
		considered necessary for safe navigation		
7	DCO limits – are there limits for permanent / temporary works such as TTT?			DCO limits cover all aspects. No separate limits for different activities
LO 1			In summary, the PLA still considers that overall the NRA is flawed. Principally this is because most of the significant issues have not been addressed and have been parked (including in relation to pilot sightlines, pylons and Tilbury). In addition, the methodology does not follow established convention of identifying hazards, their cause	Specification document to list key issues, use appropriate data and follow established risk assessment method

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
			and then proposing mitigation to reduce the risk of these hazards occurring.	
11	5.11 Need to see estimates of construction phase and how this sits with DCO boundaries to determine reasonable boundaries for DCO application			
10-May-21			Will the approached proposed pick up powers – we haven't seen a draft DCO recently so we have to work on the assumption that whilst we will make representations, at this stage LR have the powers to make byelaws allowing and prohibiting certain activities within and adjacent to the Order Limits	Relevant powers outlined in the DCO as submitted in December 2020 are summarised in the pNRA Specification. While these currently allow for making byelaws, we anticipate that for the purpose of the pNRA we will assume no new byelaws are introduced. This assumption will be stated in the pNRA.

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
10-May-21			Access - in terms of navigational risk, not being able to access our equipment to maintain or repair it is a risk so should be included	Covered as a PLA requirement. See items 3.7 and 3.17 in Minutes from 5 Aug 2020. If agreed, can be excluded from pNRA
Design				
2	2.2 Option A / B – why is dredging not included when the surrounding depths are as low as 0.9m above CD which is insufficient for a Thames Clipper style vessel		Dredging for the River Bus Pier at Broadness not included	Location of pontoon to be considered during NRA. Note update to bathymetric data will be required to support this
3	2.3 Essex Project Site – refers to incorporating a berth for the Tilbury Ferry but this isn't identified unless the existing berth is to be used? Design in Fig 2-4 causes several concerns:		No amendment or additional information for the Tilbury site and the navigational issues in that area	Pontoon layout /concept marine operation plan to be considered in discussion with PLA/PoTLL during the NRA.
	· Exposed piles on the outer berth face creating high risk of			as above

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	contact damage on aluminium vessels			
	· Berthing on a flood tide within the 'U' berthing areas when other vessels are present would be very hazardous and likely to result in frequent low speed contacts with berthed vessels and infrastructure			as above
	· Where will maintenance be conducted for these vessels?			BH understanding is that maintenance of the vessels would be undertaken within the PoT. To be confirmed with PoT during the NRA.
	· What is the anticipated frequency of operation for London Resort? How does this impact / integrate with proposals for extended RiverBus operations to Tilbury / Gravesend, PLA Pilot			Thames Clippers proposed timetables for London Resort to be assessed alongside other operations/services in the NRA.

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	Cutter Operations and the Tilbury Ferry Service?			
	· How will different passenger services / pilot services be managed to avoid delays in service and operation?			Management of passenger and pilot services to avoid delays to be discussed with BH/PLA in HAZID workshop
8	5.8 Can an example of a 1000ton Ro-Ro vessel be provided? Is this a towed pontoon or similar? What will this vessel be carrying from Tilbury to the Kent Site. How will it moor at Tilbury and how will goods be transferred to the vessel? What are the impacts of this operation on existing operations on Tilbury? All of the above need to be considered and some information provided so it can be assured this is a robust assessment. At present it is too broad.			LR project team to develop Ro-Ro vessel berth/operations plan prior to pNRA.. Vessel type and suitability for loading/offloading at Tilbury to be discussed with PoTLL during NRA.

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
10	5.9 Point 5 – The indicative pontoons are finger pontoons with insufficient capacity to provide maintenance equipment. Where will maintenance equipment (fuel, spares, oils etc) for these vessels be stored? Will this require a larger facility than indicated on these drawings?			As per item 3, pontoon layout /concept marine operation plan to be considered in discussion with PLA/PoTLL during the NRA.
12	5.12 refers to the impact of land raising and building construction on the Swanscombe Peninsula and negative impact on navigation, but no mitigation measures are proposed to address this. Further 5.12.1 identifies the level of impact of land raising; although within the document it states that such detail of land raising and buildings is still being worked on. Last two paragraphs of Pg. 51 refers to this being an issue, but will be considered at a later date.		The key issues (pilot sightlines, pylons and Tilbury) are still not addressed properly. They are highlighted and raised but without meaningful assessment or conclusion on the mitigation to address these issues. This is particularly highlighted in section 6.6. These issues should be addressed by standard risk assessment convention. As an example, it is identified at 5.3.5 that the PLA will be placing additional CCTV that will address	To be addressed in the list of key issues and risk assessed to determine suitable mitigation measures

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	This is incorrect as the issue has been identified and the site development plans need to take account of this issue.		the sightline issue across the peninsula. That is not the case it is for the NRA to identify this risk and propose it is mitigated with CCTV, which is then for the proposer to cover the cost. The whole context of the NRA is incorrect as it does not correctly identify any mitigation measure to address the identified hazards.	
10-May-21			Need to consider not only what is proposed in the DCO for day 1 in terms of the masterplan/sightlines but also what powers are in the DCO (currently extensive and allow for re-build etc) and how these are captured / assessed – for example does the NRA need to capture this on day 1 or does it need to include a mechanism for dealing with this (in the years to come) if there are changes	pNRA will need to assume a given status re masterplan/sightlines based on Day 1. Recommendations can include statement that these need to be maintained in any future development of the sight or additional NRA is carried out to assess changes.

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
LO 2			Section 5.3.1 notes the Masterplan does not include any building within 500m of Swanscombe Peninsula, yet the PLA have just reviewed proposals for a Sewage Treatment plant within 500m of Swanscombe Peninsula. [However note also email from Lucy Owen to Christine Cambrook 5 Jan 2021 "Mark has provided me with comments regarding the pylons and the sewage treatment plant (following the information that you sent across in December) - In terms of the visibility of the St Clements Pylon's then this is an area that should be addressed in the NRA along with the pilot sightline issue. The view from the pilots is that obscuring the lower half of the Pylons should not significantly impact their use as a transit at Tilburyness. However,	Masterplan/sightlines remain as per The London Resort Development Consent Order, BC080001, Sections, Doc Ref 2.4, Rev 0, December 2020 and these will be used as the assessment basis for the NRA

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
			there are concerns that overall light pollution from the development along with additional aviation lights (e.g. on a ride located close to the pylons) may make use of these pylons significantly more challenging and interfere with safe navigation on the Thames. The pylons will need to remain highly visible during day and night and not be easily confused with other lights or structures. - For the sewage treatment works it was noted that the proposed development would restrict visibility around Broadness for smaller vessels and local tugs and tows; however it was generally considered that the proposed mitigation of improved CCTV in the area would mitigate this risk. Again such issues should be	

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
			considered and addressed within the NRA.	

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
LO 3			Garry Shaw has also flagged with me the need to raise the radar antenna at Broadness and this will probably require a new mast to be built in order to place the antenna at the height required. I want to make sure this is appropriately captured (whether that is the NRA or separately).	To discuss with PLA/BH where this should sit
Stakeholder Consultation				
4	Table 4.5 should consider inclusion of vulnerable river users such as rowing boats that may operate to/from the moorings at Thurrock Yacht Club as well as at Gravesend. This also needs to be transferred into the risk assessment			rowing boats included in the table, and its noted above this covered the predominant vessels. Not clear if the "(if over 40m)" refers only to sail boats ?
16	Reviewing the minutes of the meeting on the 17th November 2017, most of the comments made by the PLA under 5.0 do not			Issues from minutes 5th August 2020 captured in following table

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	appear to have been included in the report either as issues to be addressed or with proposed outline mitigation to address them. This applies to many of the comments contained within the minutes from 5th August 2020			
Data				
5	Table 4.6 making use of data from the DfT but this should be PLA data. It seems this was requested why hasn't it been provided or used? Similarly, AIS data is from 2015 and won't take account of the significant rises in vessel movements identified within 4.5.2		Assessment remains based on 2015 data which is acknowledged to be out of date (I believe you are in the process of obtaining more up to date data from Garry Shaw).	The following data are specified for existing traffic • 14 days duration from Aug-2019 (0000 on Mon-29-Jul – 2359 on Sun-11-Aug inclusive). • 14 days duration from Oct-2019 (0000 on Mon-14-Oct – 2359 on Sun-27-Oct inclusive).
6	Table 4.5 density plots based upon each predominant vessel type would be more helpful using current data. The presented data does not assist in considering the risk of the development although it			as above for existing traffic. traffic to be based on projected: - future traffic for Thames in general (from PLA),

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	is noted these are provided for Passenger Boats			- the project traffic (to be based on Transport Assessment 6.2.9.1) and - other relevant projects (see list in the report)
9	Figure 5-8 & 5-9 Inbound and Outbound routes are marked incorrectly	corrected in final version		Updated figures to be provided in the NRA as appropriate
Risk Assessment				
4	Table 4.5 should consider inclusion of vulnerable river users such as rowing boats that may operate to/from the moorings at Thurrock Yacht Club as well as at Gravesend. This also needs to be transferred into the risk assessment			vulnerable river users including vessels under 40m to be include in risk assessment
13	9 – Last para of summary needs to be included as mitigation measure	BH updated final report in an attempt to capture this point		

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	or be included as areas to be addressed in the finalised NRA			
14	Reference is made to the reactivation of both Bell's and White's yet no recommendation is made on the need to ensure these berths are assessed and bought back to operational status as part of the recommendations		Reference is made to the reactivation of both Bell's and White's yet no recommendation is made on the need to ensure these berths are assessed and bought back to operational status as part of the recommendations. This remains outstanding	Will be covered in the risk assessment
15	Appendix A – Risk Assessment not completed to PLA standard as required for such projects.		A number of issues were previously noted with Appendix A – Risk Assessment that was not completed to PLA standard as required for such projects and all of the below remain outstanding	PLA approved risk assessment methodology stated as a requirements in the document
	· There are no inherent risk scores or detail as to how the proposed mitigation will assist in reducing scores to those that have been arrived at.		There are no inherent risk scores or detail as to how the proposed mitigation will assist in reducing scores to those that have been arrived at	

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	· There are no contact hazards for a passenger vessel such as with a Navigation / Mooring Buoy or with the proposed new passenger piers. Reviewing the design at Tilbury this is likely to be one of the highest risks and needs to be considered as a specific hazard		There are no contact hazards for a passenger vessel such as with a Navigation / Mooring Buoy or with the proposed new passenger piers. Reviewing the design at Tilbury this is likely to be one of the highest risks and needs to be considered as a specific hazard	
	· There are no collision hazards between high speed passenger ferries and recreational vessels which is more likely than any of the other collision types mentioned		There are no collision hazards between high speed passenger ferries and recreational vessels which is more likely than any of the other collision types mentioned	
	· Wash from resort traffic in relation to recreational vessels is scored very low considering incidents that have occurred in similar situations along the Thames, specifically at Greenwich Yacht club.		Wash from resort traffic in relation to recreational vessels is scored very low considering incidents that have occurred in similar situations along the Thames, specifically at Greenwich Yacht club	

	MT Comments on BH Draft NRA for London Resort	Addressed in BH Final NRA as submitted 31 Dec 2020	Lucy Owen Email 11 Jan 2021	NASH Maritime Response in NRA Specification Report
	· It is unclear why only some operations include a hazard of collision with a recreational vessel while most don't. This should be included in all operation types given the proximity Thurrock Yacht Club and the higher likelihood and severity to life for such an incident		It is unclear why only some operations include a hazard of collision with a recreational vessel while most don't. This should be included in all operation types given the proximity Thurrock Yacht Club and the higher likelihood and severity to life for such an incident	
10-May-21			Weather and RNLI points raised in our recent meeting will need picking up	Weather impact on ferry schedule hazards to be considered in pNRA.

Key Issues to be considered in pNRA - based on Minutes of PLA/BH meeting 5 August 2020

Meeting Ref	Heading	Comment	NASH Maritime Response in NRA Specification Report
Refer to response in table above			
2	In-river works		
2.1	Tilbury		
2.2		….The PLA would like more detail as to the proposed works in Tilbury.	See MT comment 3
3.1	RADAR		
3.13		GS noted that raising the radar is a potential solution, to a height of approx. 15m. This would require a new platform or structure as the existing mast adjacent has not been designed to accommodate radar at a raised height.	See MT comment LO 3
Additional Items			
2.1	Tilbury		
2.5		LO highlighted that the proposals will not work with the current arrangement for the Gravesend-Tilbury ferry service, which comes in to the rear of the landing stage.	Pontoon layout /concept marine operation plan to be considered in discussion with PLA/PoTLL during the pNRA.
2.6		LO noted the PLA Pilot Cutter also uses the downstream end of the landing stage and operates a frequent service. There is potential for this to conflict with the proposed clipper service.	as above
2.7		LO noted that PLA staff currently park cars on the landing stage; it is assumed that another arrangement will need to be made for PLA staff parking as part of the works. The edge protection will also need to be updated, though this detail can be considered post-DCO provided appropriate signposting / protective provisions are agreed.	as above

Meeting Ref	Heading	Comment	NASH Maritime Response in NRA Specification Report
2.8		LO queried how the existing services – ferry, pilot cutter will operate while the new facility is under construction.	as above
2.13	Swanscombe		
2.16		LO queried the number of vessels, and noted there may be a continuous churn of boats at peak times.	Marine Operation Plan to be developed to support pNRA will provide more detail of vessel schedules
2.19		JO queried if ro-ro access on the Thames needs to be dual sided for any particular reason, such as tidal constraints.	BH to develop Ro-Ro vessel berth/operations plan prior to pNRA
2.20		CS responded that there are plenty of examples of one-sided berthing on the Thames, but the PLA would seek to understand the proposed vessels / propulsion systems, and would use simulation to confirm the berthing operations	BH to develop Ro-Ro vessel berth/operations plan prior to pNRA
2.24		CC queried how the project needed to consider the anchorage. CS to review drawings and confirm.	*** Need feedback from BH on the response to this from PLA
3.0	Microwave Links		
3.5		GS noted that the PLA would not want to put all microwave routing through one location for resilience.	BH to address microwave link issues. pNRA to assume microwaves links are not compromised by the development or mitigation is provided
3.6		GS noted that a microwave repeater could be provided at a suitable high point on site and the path route adjusted.	as above
3.7		If this approach were to be followed, the PLA would require 24 hour access to this equipment, for 2 people and a vehicle.	as above

Meeting Ref	Heading	Comment	NASH Maritime Response in NRA Specification Report
3.10		DM queried if there is an opportunity to raise the link paths in other locations. GS confirmed these are already located at high points and there is no opportunity for raising.	as above
3.11	RADAR		
3.12		GS described the operation of the radar, and noted that while the radar does not transmit behind itself, radar can experience a secondary return, where signals are reflected from multiple surfaces. There is currently nothing behind the radar, but the proposed development will increase the chance of this secondary return.	BH to address radar location and operation issues. pNRA to assume RADAR operation is not compromised by the development or mitigation is provided.
3.14		At the current radar location, the equipment will not be able to see the proposed passenger jetty and vessels arriving and departing from this location.	as above
3.16		GS queried if the project has considered the risk of PLA equipment being at increased risk of tampering given the increase in visitors to the site. CC confirmed that it has not been considered to date, but the project can consider this. LO noted that there could be a nice design solution to this that incorporates some signage explaining the equipment, and provides increased security.	as above
3.17		GS reiterated the PLA needs to have access to this area, as per previous discussions.	as above
4	Navigation Risk Assessment		
4.2		The NRA should consider both construction and operational risks.	pNRA to consider both construction and operational risks

Meeting Ref	Heading	Comment	NASH Maritime Response in NRA Specification Report
4.7		The project should contact Thurrock Yacht Club and let them know about the public consultation process. While they may not look favourably on the development they should have an opportunity to share their views	Thurrock Yacht Club will be on the list of consultees for the pNRA
4.9		BH to set up a hazard identification workshop, following confirmation of preferred vessel movement strategy. Attendees should include Thames Clipper, Port of Tilbury, and potentially a logistics / construction operator	Marine Operation Plan to be developed with inputs from logistics/construction professional at appropriate level for the pNRA and inputs to HAZID.
4.10		CS noted that the proposal for clippers at Tilbury is complex and the PLA will require a certain amount of detail on this in order to be clear that this works for the DCO stage.	Marine Operation Plan to be developed to address this at appropriate level for the pNRA
5	AOB		
5.2		MF queried if the project will be incorporating RNLI facilities. CC and JO responded that it has been considered, but not confirmed. MF noted that the RNLI facilities should be referred to within the NRA if they are proposed.	RNLI facilities will be referred to in the NRA if they are proposed. [currently not proposed]
5.3		PLA shared that the RNLI have no facilities in this stretch of river (nothing between Tower and Gravesend), and due to the number of visitors proposed at the site, as well as the general expansion / development of London to the East, the RNLI are looking for a new location in the area. The PLA would support the inclusion of RNLI facilities.	as above

ANNEX E PLA CONSULTATION PRESENTATION APRIL 2021

21-NASH-0135_LR_PreNRA_Specification_PLA_Mtg_R03-00.pdf

ANNEX F PLA CONSULTATION MEETING NOTES APRIL 2021

20-NASH-0135_PLA_Meeting_220421-R00-03.pdf