The Great Grid Upgrade

North Humber to High Marnham

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North Humber to High Marnham

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Executive summary

NASH Maritime Ltd has been commissioned by WSP to undertake a Navigational Risk Assessment (NRA) in support of National Grid's North Humber to High Marnham project. The Proposed Development comprises a ~90 km, 400 kV overhead line (OHL) crossing a number of navigable watercourses, namely the River Ouse, Stainforth & Keadby Canal, Chesterfield Canal, Market Weighton Canal and River Idle. The NRA forms part of the Environmental Impact Assessment (EIA) required for the Development Consent Order (DCO) application.

The purpose of this NRA is to identify potential navigational hazards arising during construction of the OHL, assess the associated risks, and define appropriate mitigation measures to ensure that risks are reduced to a level that is As Low As Reasonably Practicable (ALARP).

The assessment identifies that navigational risk varies significantly between the assessed watercourses, driven primarily by vessel traffic levels, operational characteristics, and the presence of temporary works such as reduced overhead clearance or temporary bridges.

River Ouse: This represents the highest-risk environment due to the volume and nature of vessel traffic combined with tidal constraints. Key hazards relate to personal injury and grounding (a vessel making contact with the river bed). However, the requirement for a formal river closure during critical construction activities, supported by Notices to Mariners and active management via safety boats, substantially reduces risk.

Stainforth & Keadby Canal and River Idle: These are identified as low-risk environments. Vessel traffic is limited, and no temporary bridge structures are proposed. Risks are largely confined to low-consequence events involving recreational craft and are considered negligible to low.

Chesterfield Canal and Market Weighton Canal: These watercourses present a moderate relative risk, prior to control measures, due to the introduction of temporary bridge structures, which increase the likelihood of vessel contact and potential for personal injury. However, risks remain negligible/low with appropriate control measures.

Across all locations, the quantitative and qualitative risk assessment demonstrates that all identified hazards fall within "Negligible" to "Low" risk categories and are therefore acceptable when mitigation measures are applied.

A combination of embedded (baseline) and project-specific mitigation measures has been identified. These include:

- Formal watercourse closures where required (notably the River Ouse and Chesterfield Canal)
- Notices to Mariners and Canal & River Trust (CRT) stoppage notices
- Early and comprehensive stakeholder engagement and communication
- Deployment of safety boats (River Ouse)
- Use of signage, online alerts and stakeholder notifications
- Placement of trained spotters to manage local navigation

Stakeholder consultation with Associated British Ports (ABP) and the CRT has confirmed that these measures are appropriate and, if effectively implemented, will ensure that navigation risk remains controlled.

With the implementation of the proposed mitigation measures and adherence to agreed stakeholder requirements, the Proposed Development is not expected to result in significant adverse impacts on navigation. The works can therefore proceed on all assessed watercourses while maintaining safe navigation conditions throughout the construction phase. The assessment concludes that no additional mitigation measures beyond those identified are required to reduce risks to tolerable levels (i.e. ALARP).

1. Introduction

This Navigational Risk Assessment (NRA) has been produced to support the delivery of the National Grid's North Humber to High Marnham infrastructure project (hereafter referred to as the 'Proposed Development'). The Proposed Development will involve the construction of a new Overhead Line (OHL) from Birkhill Wood, East Yorkshire, to High Marnham in Nottinghamshire and will cross multiple watercourses. This report has been prepared to support an Environmental Impact Assessment (EIA) as part of a Development Consent Order (DCO) application under the Planning Act 2008 and:

- Assesses key navigational issues;
- Identifies navigation hazards; and
- Proposes risk controls that could be used to mitigate navigation risk.

1.1 Project Overview

1.1.1 The Proposed Development is a new 400 kilovolt (kV) electricity transmission connection of approximately 90 kilometres (km) in overall length between two proposed new substations: the 400 kV Birkhill Wood Substation and 400 kV High Marnham Substation.

1.1.2 The proposed new substations are subject to separate planning applications. For more information, see Application Document 5.4 Consents and Licences Required Under Other Legislation.

1.1.3 The Proposed Development comprises:

- Approximately 90 km of new overhead line (Route Code 4AF) between the proposed new 400 kV Birkhill Wood Substation and 400 kV High Marnham Substation;
- Replacement and re-alignment of a section of the existing 400 kV overhead line (Route Code 4ZQ) between Brantingham and east of Broomfleet;
- Replacement and re-alignment of a section of the existing 400 kV overhead line (Route Code ZDA) between Ealand and west of Keadby;
- Line entry connections to a proposed new 400 kV Birkhill Wood Substation;
- Line entry connections to a proposed new 400 kV High Marnham Substation; and
- The Project would include other required works, for example, temporary diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites and ancillary works. The Project would also include utility diversions and drainage works. There would also be land required for environmental mitigation, offsetting, compensation and Biodiversity Net Gain (BNG).

1.1.4 A full description of the Project is provided in Application Document 6.4 Environmental Statement Chapter 4 Description of the Project.

1.1.5 The Application Document 6.## Navigational Risk Assessment (NRA) forms part of the appendices to Application Document 6.14 Environmental Statement Chapter 14 Transport an Traffic. The outputs of the NRA have been used to inform the assessments undertaken in the chapter, including an likeliness of significant effect as a result of the Proposed Development.

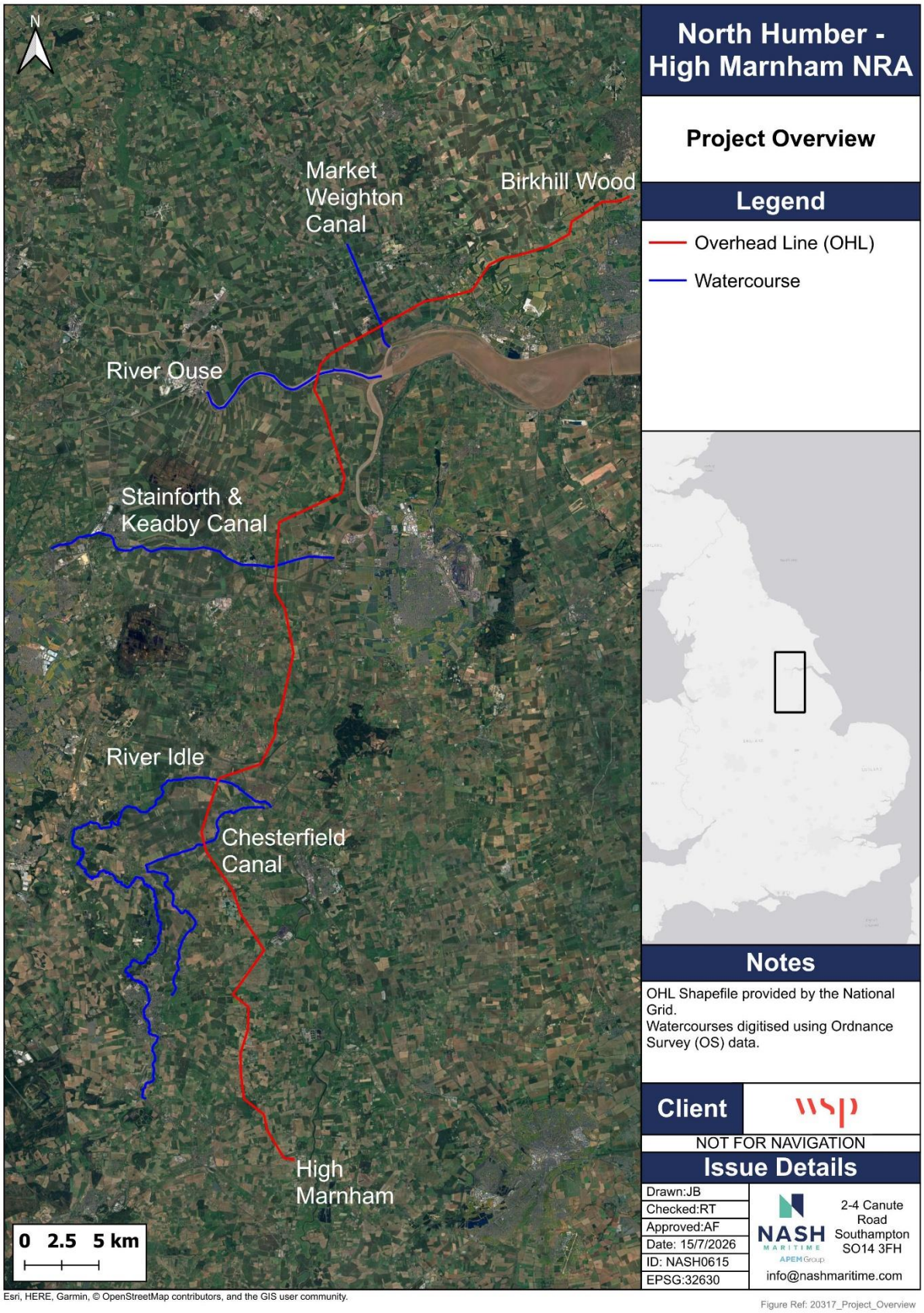
1.2 Scope of the NRA

1.2.1 The OHL will cross the following watercourses which have been scoped into the NRA:

- The River Ouse;
- The Stainforth & Keadby Canal;
- The Chesterfield Canal;
- The Market Weighton Canal; and
- The River Idle;

1.2.2 Watercourses not named above have been scoped out of this risk assessment as they are not deemed as navigable.

Image 1.1 – Proposed Overhead Line Route Overview with Watercourses

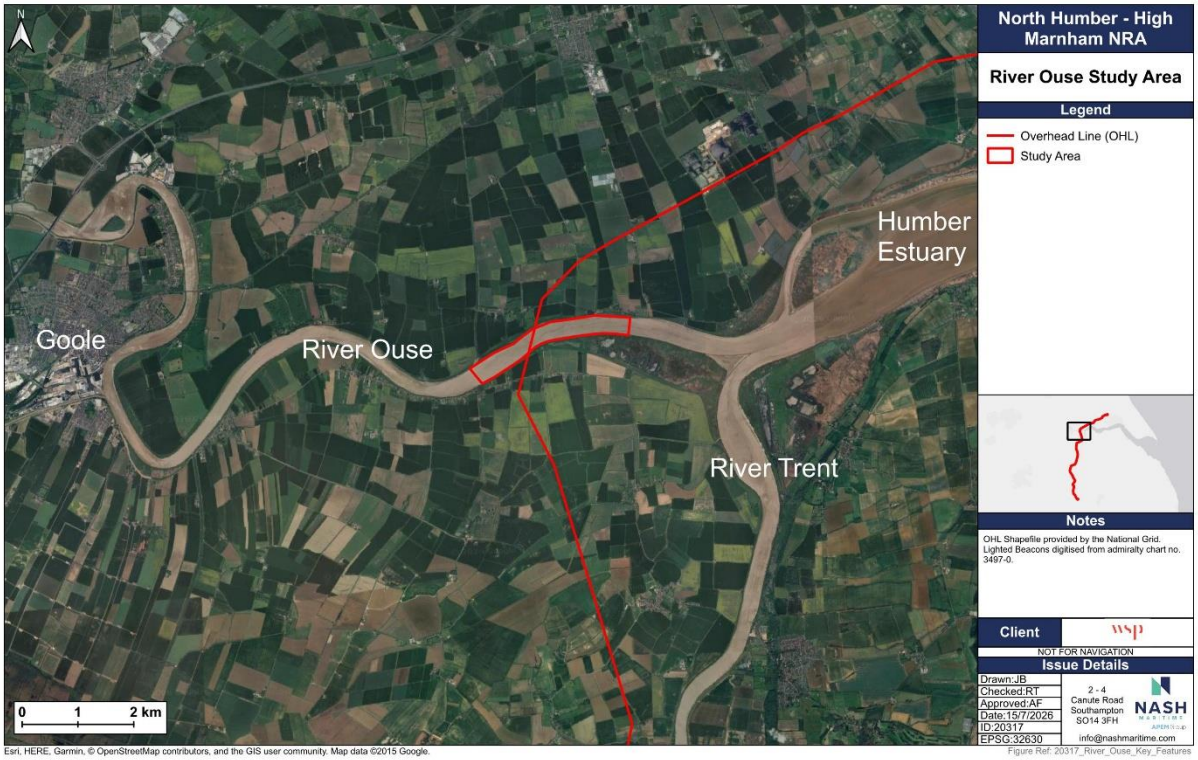


River Ouse Study Area

1.2.3 The alignment of the OHL is defined within draft Order Limits with horizontal limits of deviation generally ±50 m except for the River Ouse where this extends to approximately ±80 m. The clearance for the proposed 4AF OHL conductors is designed that under maximum sag conditions the clearance to the River Ouse will be greater than the existing 4ZQ route when under maximum sag conditions. However, during installation, the height of the conductors will be lower and there is potential risk of dropped loads from height, necessitating river closures.

1.2.4 The Study Area of the River Ouse is shown in Image 1.2, a distance of 3 km of the lower Ouse between Goole, to the west, the Humber Estuary, to the east and the River Trent, to the southeast.

Image 1.2 – Proposed Overhead Line Route Overview with Watercourses



Canals and River Idle Study Areas

1.2.5 The anticipated method of stringing across the canals and the River Idle will involve placing a net across the watercourse between two temporary scaffold structures. This approach is commonly used when carrying out works across roads, railways and navigable watercourses, and helps to protect property and the public from falling objects during the stringing operation.

1.2.6 Construction of the OHL will require temporary bridges across the Market Weighton Canal and Chesterfield Canal to facilitate temporary access to working areas during construction of the overhead line. These will be removed once construction is complete.

1.2.7 For the Market Weighton Canal, a temporary bridge is likely to be set at bank level. Specific details for the type of bridge to be used on the Chesterfield Canal are yet to be confirmed although Application Document 6.4, Environmental Statement Chapter

4 states that: '*Most bridge crossings would be of a short span and flat deck construction; however, Bailey style bridges may also be used. All bridges would be clear span, and the foundations would be placed clear of the main channel of the watercourse, where feasible*'[1].

1.2.8 Image 1.3 and Image 1.4 show the illustrative design drawings for temporary bridges that may be used. It should be noted that the type of temporary bridge selected and the duration of its use will ultimately depend on the findings of the ground investigations.

1.2.9 Considering this information, the Study Areas for these watercourses have been set at approximately ±200 m from the indicative position that the OHL crosses each watercourse.

Image 1.3 – Plan View of Indicative Temporary Bridge

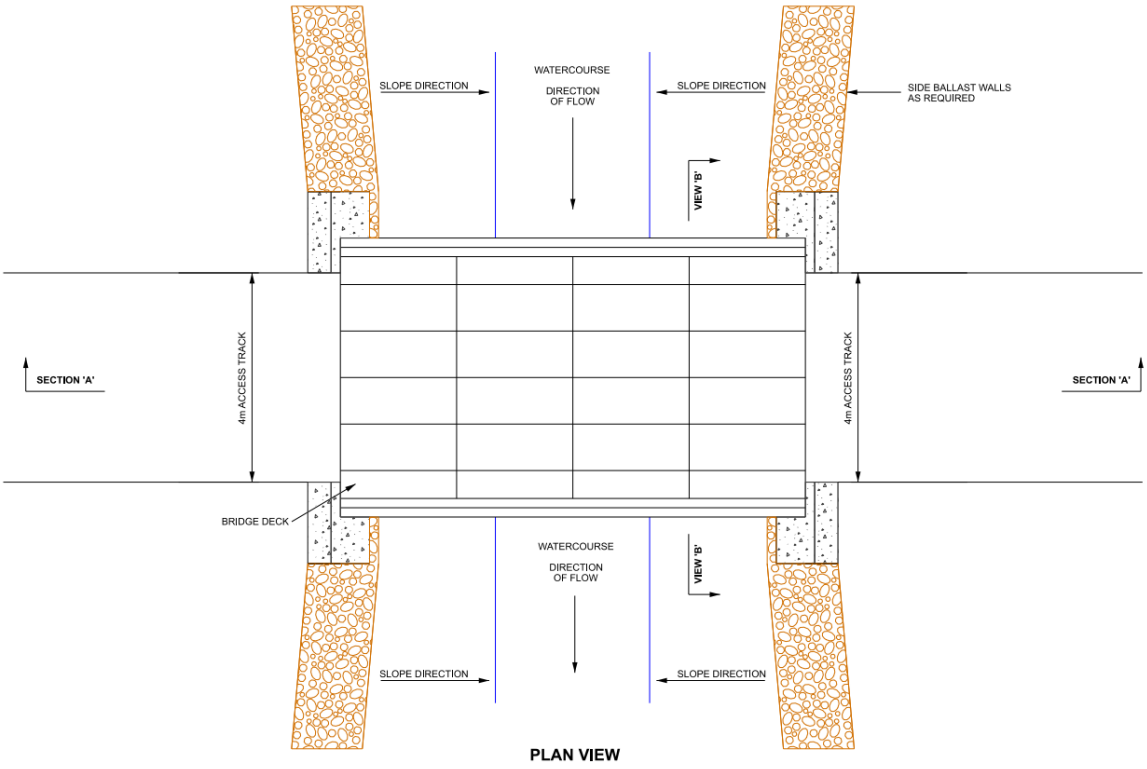
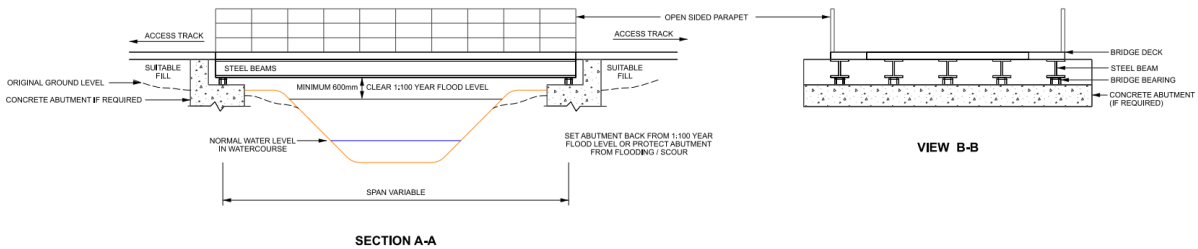


Image 1.4 – Elevation View of Indicative Temporary Bridge



[1] https://www.nationalgrid.com/the-great-grid-upgrade/north-humber-high-marnham/document-library

1.3 Document Structure

1.3.1 The NRA is structured as follows:

- **Section 1**:Introduction (current section);
- **Section 2**: Baseline Navigation Characteristics – River Ouse;
- **Section 3**: Baseline Navigation Characteristics – Canals & River Idle;
- **Section 4**: Vessel Traffic Analysis;
- **Section 5**: Stakeholder Consultation;
- **Section 6**: Navigational Risk Assessment;
- **Section 7**: Conclusions and Recommendations; and
- **Appendix A**: Hazard Logs.

2. Baseline Navigation Characteristics – River Ouse

The River Ouse flows from Linton-on-Ouse, through York, and joins the River Trent at Trent Falls as it enters the Humber Estuary. Approximately 60 miles of the river are navigable and downstream of Naburn the river is partly tidal. The port of Goole is the UK's largest inland port and handles approximately 1.5 million tonnes of cargo per year.

2.1 Primary Legislation and Guidance

2.1.1 The following section provides a summary of the relevant legislation, guidance, procedures and practices relevant to this NRA.

The Humber Harbour Reorganisation Scheme 1966 Confirmation Order 1967

2.1.2 This act confirmed a reorganisation scheme for Humber Harbour made by the National Ports Council, in exercise of their powers under s18 of the Harbours Act 1964. The Scheme dissolved the Humber Conservancy Board and ordered the transfer of all powers, duties, liabilities, property, staff, pension rights etc. from the Humber Conservancy Board to the British Transport Docks Board. The Scheme further made provision for a Humber Local Board of 17 members to advise and assist the Docks Board in the exercise and discharge of their functions in relation to the River Humber and its ports. Later, the Transport Act 1981[2] reconstituted the British Transport Docks Board to Associated British Ports (ABP).

The British Transport Docks Act 1972[3]

2.1.3 This act made provision for a harbourmaster for the Humber and for publication of General and Special directions. General Directions and Special Directions (defined in Section 52 of the Harbours Docks and Piers Clauses Act 1847[4]) are statutory powers used by ABP as the Statutory Harbour Authority (SHA) to control vessel movements and ensure safe navigation.

2.1.4 The General Directions can be used to:

give directions applicable to all vessels, or to a specified class of vessels, at the docks, for the purpose of ensuring the safety of vessels at the docks, preventing injury to persons at, or to property at, or forming part of, the docks or of securing the efficient conduct of the business carried on at the docks, and, without prejudice to the generality of the foregoing, such directions may relate to-

(a) the movement, berthing or mooring of a vessel;

[2] https://www.legislation.gov.uk/ukpga/1981/56/contents

[3] https://www.legislation.gov.uk/ukla/1972/37/pdfs/ukla_19720037_en.pdf

[4] https://www.legislation.gov.uk/ukpga/Vict/10-11/27/contents

(b) the dispatch of its business at the dock;

(c) the disposition or use of its appurtenances or equipment;

(d) the use of its motive power;

(e) the embarking or landing of passengers;

(f) the loading or discharging of cargo, fuel, water or ship's stores;

(g) the use of ballast.

General Directions

2.1.5 The general directions to vessels in the Humber pertinent to this study are:

6.-(1) The Board may, after consultation in each case with the specified bodies, give directions for the purpose of promoting or securing conditions conducive to the ease, convenience or safety of navigation in the Humber, and, without prejudice to the generality of the foregoing, for any of the following purposes:-

(a) for designating areas, routes or channels in the Humber which vessels are to use or refrain from using for movement or mooring;

(b) for securing that vessels move only at certain times or during certain periods[5]

2.1.6 These directions give ABP authority to restrict vessel movements in certain areas or at certain times on the River Ouse.

Ports and Marine Facilities Safety Code

2.1.7 The Port and Marine Facility Safety Code (PMSC)[6] (sometimes referred to as 'the Code') sets out a national standard for every aspect of port and marine facility safety. Its aim is to enhance safety for everyone who works in, or uses, ports, harbours, marinas and other marine facilities. The PMSC provides 10 key measures for marine safety which are:

1) Duty Holder: whose members are typically, individually and collectively, accountable for compliance with the Code, and their organisation's performance in ensuring safe marine operations.
2) Designated Person: provides independent assurance about the operation of the organisation's marine safety management system and must have direct access to the Duty Holder.
3) Legislation: the Duty Holder must be aware of and review the organisation's legal powers, duties and responsibilities based on applicable local and national legislation and seek additional powers if necessary to improve marine safety.
4) Duties & Powers: organisations must comply with any statutory duties and responsibilities they have.
5) Risk Assessment: organisations must ensure that risks are formally assessed and are eliminated or reduced to the lowest possible level, so far as is reasonably practicable, in accordance with good practice.

[5] https://www.legislation.gov.uk/ukla/1972/37/pdfs/ukla_19720037_en.pdf

[6] https://assets.publishing.service.gov.uk/media/67fd175bed87b81608546666/port-marine-safety-code.pdf

6) Marine Safety Management System (MSMS): organisations must operate an effective MSMS which is based on formal risk assessment.

7) Review & Audit: organisations must review and audit performance against applicable requirements of the Code.

8) Competence: organisations must use people who are appropriately trained, qualified and experienced to manage marine safety.

9) Plan: organisations must publish a marine safety plan showing how the standards in the Code will be met and produce a report assessing performance against that plan at least every 3 years.

10) Conservancy Duty: organisations must ensure their facilities are fit for purpose and have a duty of reasonable care to ensure that any vessel can utilise them safely.

2.1.8 The PMSC reinforces a port's statutory responsibility regarding the safety of navigation and the requirements in terms of assessing navigation risk.

Statutory Harbour Authority

2.1.9 ABP Humber operates as the SHA for the River Ouse up to the southern face of Skelton Railway bridge, located northeast of the Port of Goole[7]. ABP Humber is also the Competent Harbour Authority (CHA) for the purposes of pilotage within its jurisdiction.

Humber Navigation Byelaws 1990

2.1.10 A detailed set of byelaws to ensure orderly control of navigation, mooring and handling of goods within the port. The byelaws are split into six sections covering:

1) Preliminary;

2) General duties of masters of vessels;

3) Lights and signals;

4) Mooring and management of vessels;

5) Conduct of persons; and

6) Penalty for contravention of byelaws responsibility and defence.

2.1.11 The Humber Navigation Byelaws 1990 establish the legal framework governing vessel movements and marine activities within the Humber Estuary and the Rivers Ouse. The byelaws set out the duties of vessel masters, operational requirements, and safety rules to ensure safe navigation.

2.1.12 The byelaws place primary responsibility on the master of the vessel to ensure safe operation at all times, including providing advance notice of movements to Vessel Traffic Services (VTS) Humber, maintaining a continuous Very High Frequency (VHF) listening watch, and ensuring that vessels are adequately manned and under competent control. Masters must navigate with due care, avoid obstructing fairways, comply with reporting requirements, and immediately report incidents such as collisions, groundings, or defects affecting seaworthiness. Speed and manoeuvring

[7] https://www.abports.co.uk/locations/goole

are also regulated, with obligations to reduce speed near jetties or operational activities and to give way appropriately in tidal conditions.

2.1.13 The byelaws also address traffic management, anchoring, and mooring practices, requiring vessels to remain in a moveable condition, be securely moored, and avoid anchoring in fairways except in emergencies. Where anchoring occurs, vessels must maintain anchor and radio watches and report positions to VTS.

2.1.14 Finally, the byelaws include rules on signals, conduct, and enforcement, such as the use of sound signals, lighting requirements for vessels, and restrictions on activities that may interfere with navigation. Harbour Masters are granted authority to inspect vessels and issue directions, and breaches of the byelaws may result in penalties.

Vessel Traffic Service

2.1.15 ABP provide Vessel Traffic Service (VTS) for the Humber SHA area. VTS provides a shore-based system designed to ensure the safe and efficient movement of vessels within the Humber and Lower Ouse.

2.1.16 Humber VTS utilises continuous VHF radio communication, Automatic Identification System (AIS) tracking, and radar surveillance to monitor vessel activity and maintain situational awareness, enabling it to advise on vessel arrivals, departures, berthing, hazards, visibility, and tidal conditions. Vessels operating within the VTS area are required to maintain continuous listening watch on designated channels and report to VTS when entering, moving within, or departing the area, ensuring coordinated and orderly traffic flow.

Pilotage Requirements

2.1.17 Humber Pilotage Control operate from Grimsby and Immingham and VTS Humber operates from Grimsby, coordinating all marine operations. Pilotage is compulsory for vessels >60 m, and all pilotage requests must be communicated via Humber VTS, with formal booking completed through an online system[8].

2.1.18 Vessels inbound to the Humber Pilotage Area are required to provide at least 12 hours' advance notice, with a further confirmation of arrival approximately 2.5 hours before reaching the pilot boarding area, while outbound vessels must give at least 2 hours' notice.

2.1.19 Pilot boarding and disembarkation take place at designated offshore positions depending on vessel size and route, with specific arrangements in place for very large or complex vessels. Vessels, which are exempt compulsory pilotage on the River Humber, but which require a pilot for Rivers Trent or Ouse, embark the pilot at Hull Roads on Riverside Quay, Albert Dock, Hull.

Aids to Navigation

2.1.20 Aids to Navigation (AtoNs) are marks or beacons which assist vessels to navigate safely. ABP provide the following guidance for pleasure craft transiting upstream on the Humber[9]: AtoNs for the River Ouse Study Area are shown in Image 2.1.

[8] https://www.humber.com/media/otvbh3cf/the-humber-pilotage-directions-amended-2016.pdf

[9] https://www.humber.com/yachting_and_leisure/pleasure_craft_navigation

Image 2.1 – AtoNs for the River Ouse with the Proposed OHL

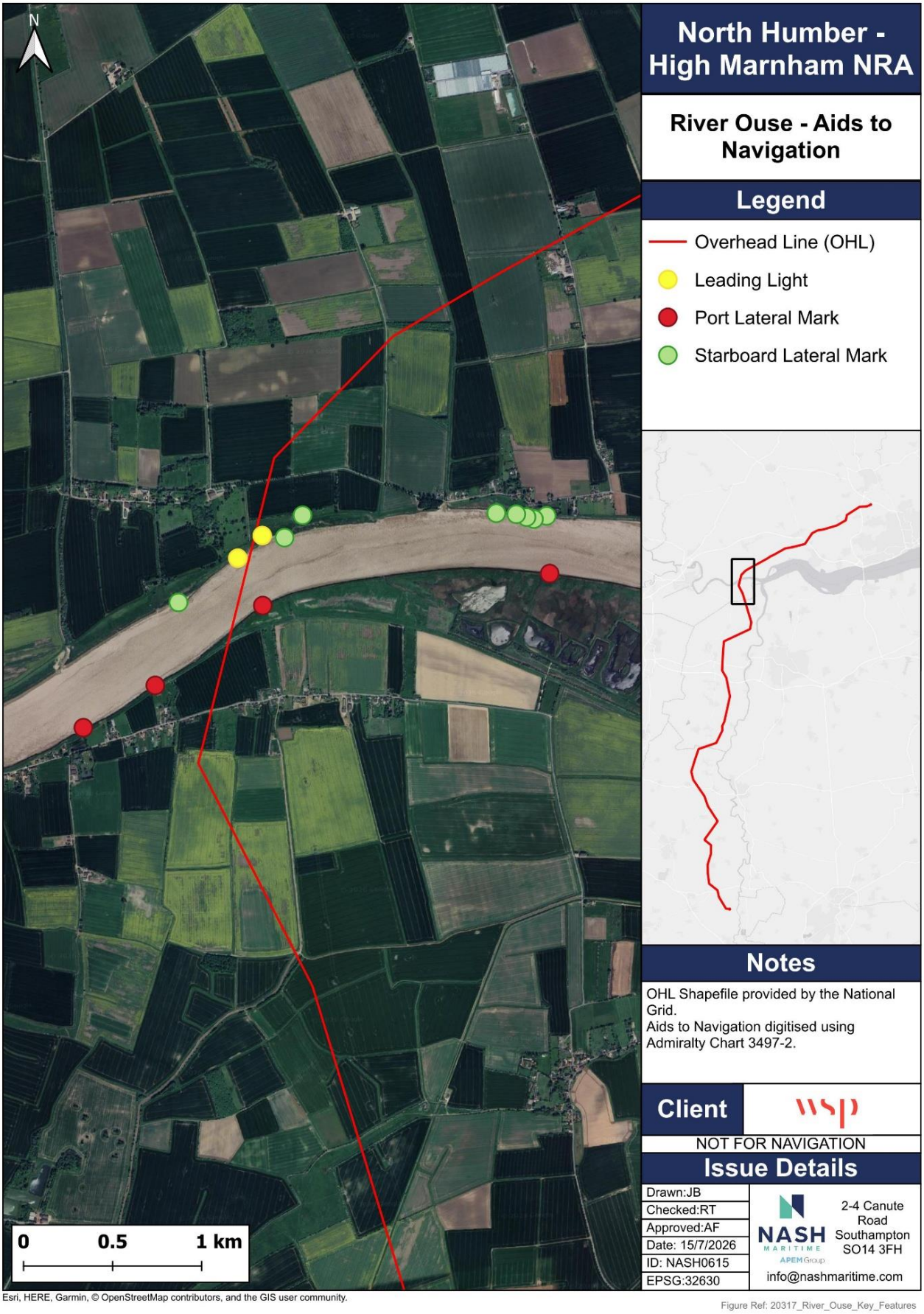


Figure Ref: 20317_River_Ouse_Key_Features

2.1.21 The River Ouse is accessed by passing Apex Light to port, then proceeding close to the training wall until reaching a position abeam of No. 2 Light Beacon, after which vessels should cross towards Blacktoft Jetty on the opposite bank. Navigation along this section is supported by green lights - comprising a rear occulting light and a front flashing light - located on the jetty.

2.1.22 Vessels entering the Ouse may establish communication with the Port of Goole or Blacktoft Jetty on VHF Channel 14 to obtain up-to-date depth information for the river. Depth and navigational updates are also included in routine broadcasts from VTS Humber on Channel 12. Blacktoft Jetty is primarily intended for use by commercial vessels between tidal windows, and recreational craft are advised not to moor there except in emergencies. Charges apply for use of the facility.

2.1.23 From Blacktoft to Goole, navigation is aided by lateral marks with red lights marking the port side and green lights marking the starboard side. Blacktoft Reach is the easternmost port lateral mark and Whitgift Roads is the westernmost port lateral mark (western extent) shown in Image 2.1. Both display red lights, the former flashes red every 4 seconds and the latter is a very quick red flashing light[10].

Local Notices to Mariners

2.1.24 Local Notices to Mariners (LNtM) issued by ABP Humber are formal communications used to provide up-to-date information essential for the safe navigation and management of vessels within the Humber estuary and its associated rivers.

2.1.25 These notices typically include details such as temporary or permanent changes to navigation aids (e.g. buoys and lights), dredging operations, hazards, revised traffic procedures, regulatory updates, and alterations to VHF channels or reporting requirements. They may also announce new safety measures, amendments to existing directions, or information relevant to ongoing works within the port area. As such, they ensure that mariners are continually aware of current conditions that are not reflected in nautical charts or static publications.

2.1.26 A full list of currently active LNtM can be found on the ABP website[11] .

Baseline Risk Controls

2.1.27 Baseline risk controls are those that are currently utilised to manage navigation risk with the Humber. These risk controls have been summarised above and include, but are not limited to:

- The Humber Harbour Reorganisation Scheme 1966 and Confirmation Order 1967;
- The British Transport Docks Act 1972;
- General Directions;
- Special Directions;
- PMSC;

[10] United Kingdom Hydrographic Office Admiralty Chart no. 3497-0

[11] https://www.humber.com/estuary_information/marine_information/notice-to-mariners

- Humber Navigation Byelaws 1990;
- VTS;
- Pilotage;
- AtoN; and
- LNtM.

Tidal Regime

2.1.28 Table 2.1 summarises the mean high water and low water levels for spring and neap tides at Blacktoft and Goole. On Spring tides, the two sites show similar ranges yet during neap tides, Blacktoft shows a larger tidal range of 2.6 m compared to 2 m at Goole. Furthermore, water levels at Blacktoft are 1.50 m and at Goole are 1.40 m with regard to Ordnance Datum. These differences are likely due to Goole being located upstream of Blacktoft.

2.1.29 On the River Ouse, tides flood for two to three hours and ebb for up to ten hours. Tidal flows are typically 1-3 knots and at low water, the lower reaches of the river are shallow which puts recreational craft at risk of grounding[12].

Table 2.1 – Summary of Tidal Heights (relative to Chart Datum)[13]

Location	Lat (N)	Long (W)	Heights in metres above datum				Datum / Comments
			MHWS	MHWN	MLWN	MLWS	
Blacktoft	53 42	0 43	5.7	4.0	0.4	0.2	1.50 m below Ordnance Datum (Newlyn)
Goole	53 42	0 52	5.7	3.7	0.7	0.3	1.40 m below Ordnance Datum (Newlyn)

Historical Incidents

2.1.30 Historical Incident data (1990-2024) from the Marine Accident Investigation Branch (MAIB) was analysed to determine the risk profile for the River Ouse within the study area (Image 2.1). Table 2.2 shows incident data for the River Ouse. Six incidents were reported for this area: three groundings, one collision, one contact and one incident relating to a mechanical issue or damage. It is worth noting that the reliability with which incidents have been reported will have improved more recently compared to when records began.

[12] https://canalrivertrust.org.uk/media/document/gagJqJpi1W8ypLozrCzMsw/NNwaE3uCgpMNDZvVJnGijIohwy-Ptmp5YyD-zu3I-Dw/aHR0cHM6Ly9jcnRwcm9kY21zdWtzMDEuYmxvYi5jb3JlLndpbmRvd3MubmV0L2RvY3VtZW50Lw/01899274-c06b-7d13-8aa9-b5ab7404d0c4.pdf

[13] United Kingdom Hydrographic Office Admiralty Chart no. 3497-0

Table 2.2 – Historical Incidents - River Ouse

Incident Type	Vessel Type(s)	Length Overall (LOA) (metres)	Year	Description
Collision	Cargo - Yacht	87	2020	Cargo vessel collided with yacht that had dragged its anchor.
Contact	Cargo	89	2011	The vessels stern landed on the jetty. There was minor damage to the vessel and jetty.
Grounding	Cargo	87	2011	The vessel was set by the river flow onto an adjacent bank. She was re-floated and re-berthed 30 minutes later. There was no damage.
Grounding	Cargo	87	2011	The vessel lay aground 5 m off a nearby pier and was secured using mooring lines. The vessel was later refloated on the next tide without assistance.
Grounding	Cargo	88	2017	The vessel was pushed onto mud bank on the south side of the river by the flood tide. The ship was re-floated the following day with the use of tugs and sailed to the next port. The vessel was undamaged and there was no environmental damage.
Mechanical/ Damage	Cargo	89	2023	A propulsion failure affected the vessel for no longer than 5 seconds.

2.1.31 All incidents that occurred involved cargo vessels, likely pertaining to the commercial nature of the Port of Goole. The most common incident type was grounding (50% of total incidents) which reflects the tidal constraints associated with commercial activity coming into and out of the Port of Goole.

3. Baseline Navigation Characteristics – Canals & River Idle

This section describes the baseline navigation environment for both the Stainforth & Keadby Canal and Chesterfield Canal which are managed by the Canal & River Trust (CRT), and the River Idle which is not formally managed.

3.1 Statutory Navigation Authority

CRT

3.1.1 CRT is the charity responsible for managing and maintaining the navigability and safety of 2,000 miles of waterways in England and Wales which includes the Chesterfield Canal and Stainforth & Keadby Canal. The organisation also owns 1,582 locks, 55 tunnels, 2,970 bridges, 281 aqueducts and 71 reservoirs on the English and Welsh canal networks.

Legislation

3.1.2 CRT was founded in 2012, when the responsibilities, assets, and liabilities of British Waterways were transferred to the charity. This took place under the British Waterways Board (Transfer of Functions) Order 2012 which amended sections 104 and 105 of the Transport Act 1968.

3.1.3 In England and Wales, rather than repealing and re-enacting the legislative framework, existing statutes continue to have effect, with references to the British Waterways Board read as referring to the Trust, thereby conferring the same powers and duties. The key Acts underpinning those powers include the Transport Act 1962 (which originally established and empowered British Waterways), the Transport Act 1968 (which classified watercourses and defined duties), and later private legislation such as the British Waterways Act 1971, British Waterways Act 1975, British Waterways Act 1983, and the British Waterways Act 1995, all of which remain in force and continue to govern matters such as navigation, licensing, enforcement, and management of the inland waterways now operated by the Trust.

3.1.4 Apart from primary legislation, CRT relies on a substantial body of published policies[14] , guidance and codes of practice to regulate how its assets (land, waterways and infrastructure) are used, accessed and affected. The most important categories are outlined below.

[14] https://canalrivertrust.org.uk/the-publication-scheme/our-publication-scheme/our-policies-and-procedures

Guidance

Code of Practice for Works Affecting the Canal & River Trust

3.1.5 This Code of Practice (CoP)[15] is the Trust's most significant operational guidance document for protecting its assets. It sets out mandatory procedures and technical requirements for any third-party works on, over, under or adjacent to CRT land or waterways, including bridges, utilities, dredging, discharges and construction. Compliance with the CoP is normally required as a condition of CRT consent and forms the practical basis on which the Trust controls risk, safety and infrastructure integrity.

3.1.6 Canal/River Stoppages and Towpath Closures should be avoided if possible. Alternative working arrangements found in the CoP (Part 1, Section 5) should be considered at the planning stage of the Proposed Development.

Memoranda and Sector-Specific Guidance

3.1.7 CRT issues or co-authorises supplementary guidance for specific sectors, such as:

- Local authority guidance[16] for highways structures over watercourses, developed with the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), which adapts the Code of Practice to highway maintenance activities;
- Bespoke technical notes and approvals for utilities, transport schemes and infrastructure promoters.

3.1.8 These documents ensure consistency while recognising other statutory functions.

Policies

Asset Management Policy Statement

3.1.9 This policy explains how the Trust manages, maintains and protects its waterways and associated infrastructure (locks, embankments, bridges, culverts and reservoirs). It guides decision-making on inspection, repair, investment and risk prioritisation across the network, and underpins how CRT justifies controls placed on third-party activities that may affect asset condition or safety.

Towpath and Land Use Policies

3.1.10 CRT regulates public and commercial use of its land through a suite of policies, including:

- Towpaths for Everyone Policy (governing access, cycling and shared use);
- Restricted Activities on Trust Land Policy; and
- Third-Party Activities and Events guidance.

3.1.11 These documents define what activities are permitted, restricted or licensed on Trust land and provide the framework for granting permissions and enforcing conditions.

[15] https://canalrivertrust.org.uk/business-and-trade/undertaking-works-on-our-property-and-our-code-of-practice

[16] https://www.adeptnet.org.uk/sites/default/files/media/2023-04/ADEPT%20Canal%20and%20River%20Trust%20Guidance%20Document%202023%20update.pdf

Harbour, Navigation and Enforcement Policies

3.1.12 For navigations, docks and harbours under its control, CRT uses specific Harbour Authority Enforcement policies, boating guidance, licensing policies and customer service standards. These documents guide how statutory navigation powers are exercised in practice and how compliance is managed.

Environmental and Heritage Policies

3.1.13 The Trust's Natural Environment Policy and Heritage Policy Statement guide how its assets are protected in environmental and conservation terms. These are routinely relied upon when assessing proposals that may affect watercourses, banks, historic structures or landscapes.

Baseline Risk Controls

3.1.14 Baseline risk controls are those that are currently utilised to manage navigation risk on the CRT network. These risk controls have been summarised above and include, but are not limited to:

- Transport Act 1962 & 1968;
- British Waterways Act 1971, 1975, 1983 and 1995;
- Code of Practice;
- Memoranda and Sector-Specific Guidance;
- Asset Management Policy Statement;
- Towpath and Land Use Policies;
- Harbour, Navigation and Enforcement Policies;
- Environmental and Heritage Policies; and
- Promulgation of information to CRT network users, operators, licensees and adjoining land owners.

3.2 Stainforth & Keadby Canal

3.2.1 The Stainforth & Keadby Canal forms part of the CRT network, linking the Sheffield & South Yorkshire Navigation with the River Trent at Keadby, forming part of the wider Sheffield & South Yorkshire Navigation network. The canal is 14.9 miles in length and contains three locks.

3.2.2 Historically the canal carried large working boats, such as compartment barges transporting coal and other bulk goods, and supported a significant boat building industry at Thorne. Today, however, as freight traffic has largely declined, the canal is used almost entirely by leisure craft, including narrowboats and small cruisers. Leisure boaters typically cruise along quiet rural stretches between the Doncaster area (via the River Don and New Junction Canal) and the tidal River Trent at Keadby, sometimes continuing onto the Trent for longer journeys. The canal's straight course, swing bridges, and open countryside make it a relatively calm but occasionally technical cruising route.

3.2.3 Alongside boating, the canal corridor is well used for recreation on land, with regular walkers, anglers, and cyclists making use of towpaths and nearby greenway routes. The maximum boat length permitted to navigate this canal is 18.8 m and further information can be found on the CRT's website[17].

3.3 Chesterfield Canal

3.3.1 The Chesterfield Canal forms part of the CRT network, linking the River Trent at West Stockwith to Chesterfield through Nottinghamshire, South Yorkshire and Derbyshire. The canal is 46 miles in length and contains 59 narrow locks and six wide locks.

3.3.2 Historically the canal was an important freight route carrying coal, iron, agricultural produce and other goods. Today, however, the canal has little to no significant commercial use and is used almost exclusively by leisure craft, including narrowboats, private cruisers, and visitor trip boats, reflecting its role as a recreational cruising waterway rather than a freight route.

3.3.3 Because parts of the canal are still being restored, boating is currently split into navigable sections - most notably between West Stockwith, Retford and Worksop, and a shorter restored stretch near Chesterfield - so leisure boaters typically cruise along these rural sections or connect with the River Trent for wider journeys.

3.3.4 The maximum boat length permitted to navigate this canal is 21.95 m. Further information can be found on the CRT's website[18].

3.3.5 The Chesterfield Canal is known locally as the 'Cuckoo Dyke' and has a walkable towpath, the 'Cuckoo Way', which is clearly signposted for 46 miles from Chesterfield to West Stockwith.

3.4 Market Weighton Canal (No Navigation Authority)

3.4.1 The Market Weighton Canal starts at Weighton Lock on the Humber Estuary and continues upstream just southwest of Market Weighton. The right of navigation through the Humber Lock, along with a section under the A63 at Newport was extinguished in 1971 under section 112 of the Transport Act 1968.

3.4.2 The entrance lock from the Humber Estuary is controlled by the Environment Agency (EA) although currently not operable and thought to have not been opened for approximately 20 to 30 years. Anecdotally, the river is known to be navigable 9.7 km upstream of this lock where there is a confluence of with the River Foulness.

3.4.3 A combination of no existing right of navigation, the inoperable lock and limited spatial extent of navigable water means that now, it is only likely that unpowered recreational craft use this watercourse if any recreational craft at all. Much of its adjacent path has been repurposed into walking routes such as the Market Weighton Canal Trail, and like many UK towpaths, it is used by walkers, cyclists, anglers and wildlife enthusiasts exploring the flat Yorkshire landscape.

[17] https://canalrivertrust.org.uk/canals-and-rivers/stainforth-and-keadby-canal/boating-the-stainforth-and-keadby-canal

[18] https://canalrivertrust.org.uk/canals-and-rivers/chesterfield-canal/boating-the-chesterfield-canal

3.5 River Idle (No Navigation Authority)

3.5.1 The River Idle is a natural river about 26 miles (42 km) long, flowing from the confluence of the Rivers Maun and Meden near Markham Moor to the River Trent at West Stockwith. Around 10–11 miles (17–18 km) between West Stockwith and Bawtry are navigable in principle, though this section has always been limited in use compared with major waterways.

3.5.2 Historically, the river carried small cargo vessels transporting goods such as lead, wool and agricultural produce to Bawtry, but trade declined from the late 18th century following competition from canals and railways. Today, navigation is technically possible but highly restricted, requiring advance notice to pass the tidal sluice at West Stockwith and the payment of a significant fee (reported as £300 anecdotally). Combined with siltation and limited maintenance - particularly upstream of Haxey Gate - this means usage is low, with only occasional visits by small cruisers, narrowboats within size limits, and canoes rather than regular traffic.

3.5.3 The OHL crossing occurs approximately 1 km upstream of Haxey Gate where, anecdotally, the River Idle is not maintained and heavily silted.

4. Vessel Traffic Analysis

4.1 River Ouse

4.1.1 The movements of vessels were captured through collection of AIS data. AIS is a transponder system fitted to most commercial vessels which broadcasts information about itself to other nearby vessels and was principally developed for collision avoidance.

4.1.2 According to SOLAS Chapter V, Regulation 19, an Automatic Identification System (AIS) is mandatory for:

- Passenger ships, regardless of size.
- Cargo ships of 300 GT and upwards on international voyages.
- Cargo ships of 500 GT and upwards not on international voyages.

4.1.3 AIS must operate continuously unless international regulations permit otherwise for safety or security. This requirement generally excludes small, non-SOLAS vessels like fishing boats under 15m and pleasure craft, though voluntary installation is common.

4.1.4 AIS data includes dynamic positional data (location, speed, course etc.) and static identification data (name, type, size, destination etc.). The location of the data capture area is shown in Image 1.4 along with other key features surrounding the River Ouse.

4.1.5 To determine the nature of vessel traffic on the River Ouse, AIS data was acquired and processed for the 12-month period 01 June 2025 to 31 May 2026. As AIS is not required on small recreational vessels (although some larger recreational craft voluntarily carry AIS) it is likely that any recreational traffic may not have been captured as part of the dataset.

Vessels by Type

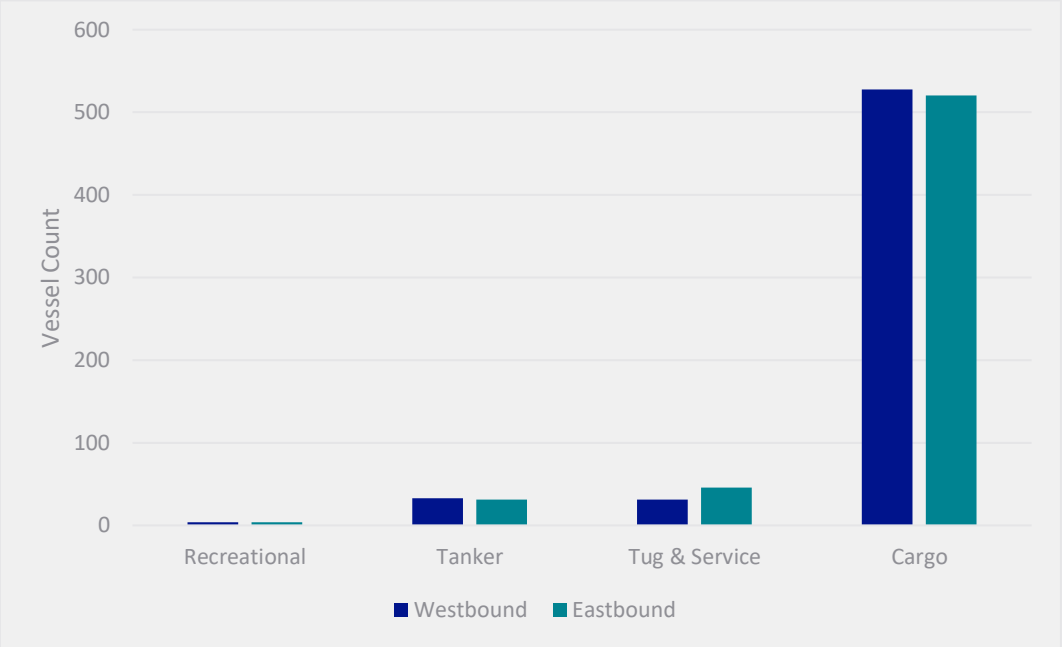
4.1.6 AIS data was partitioned to show vessel transits by type among the following categories:

- Cargo;
- Recreational;
- Tanker; and
- Tug and Service vessels.

4.1.7 Counts of transits by vessel type, passing the indicative position of the OHL is shown in Image 4.1. Cargo vessels comprise the highest transit count by any given vessel type with over 500 transits in each direction. This is likely due to the commercial nature of the Port of Goole as previously mentioned. The underrepresentation of recreational vessels, present in Image 4.1, has been supplemented by pleasure craft data provided by ABP. This data showed that approximately 200 pleasure vessels locked into Goole during the year 2025, the majority of which (85%) transited during

the months from April to September. Again, it is worth noting that these counts are only for vessels locking into Goole, there is likely to be additional recreational vessel movements utilising the River Ouse.

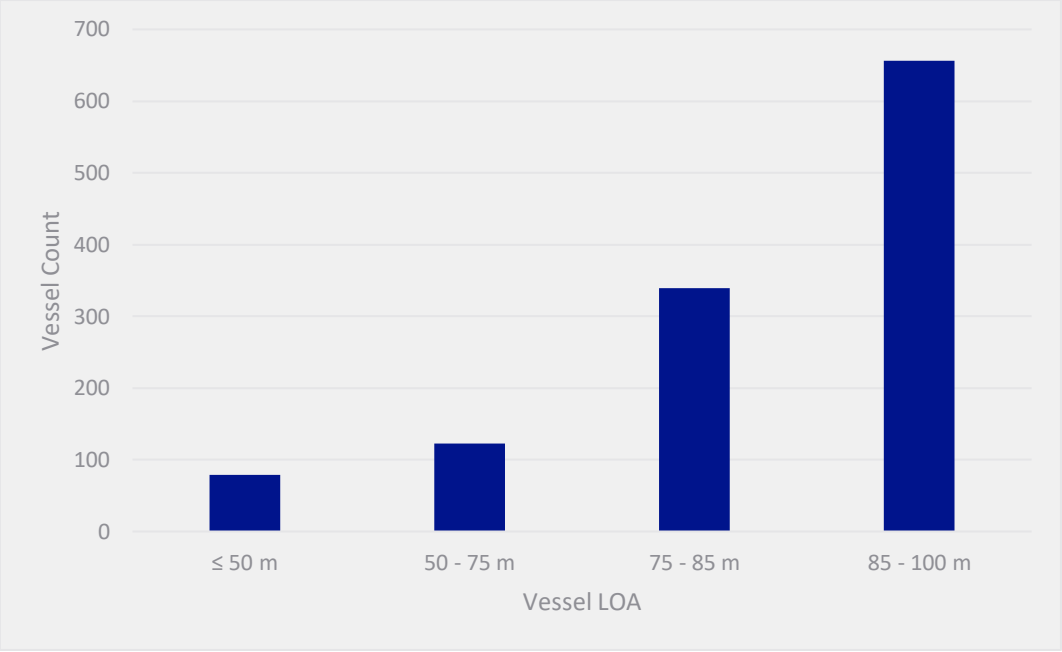
Image 4.1 – Vessel by Type



Vessels by Length

4.1.8 Vessel transits by vessel length overall (LOA) are summarised by frequency in Image 4.2. During the data capture period, vessels between 85 m to 100 m transited this section of the River Ouse most frequently. This pattern supports the notion of a high frequency of cargo vessels utilising the port.

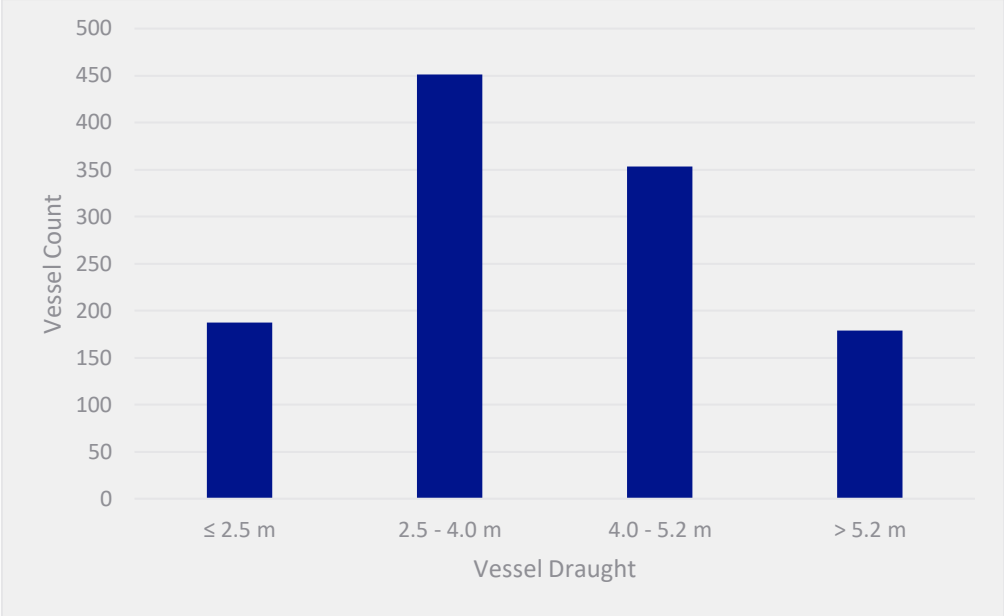
Image 4.2 – Vessels by LOA



Vessels by Draught

4.1.9 Vessel activity by draught is presented in Image 4.3. Approximately 84% of vessels transiting have a draught over 2.5 m. Larger draught vessels require greater depths of water to navigate safely and minimise the risk of grounding, especially in tidal systems such as the Goole where historic incidences of grounding have occurred.

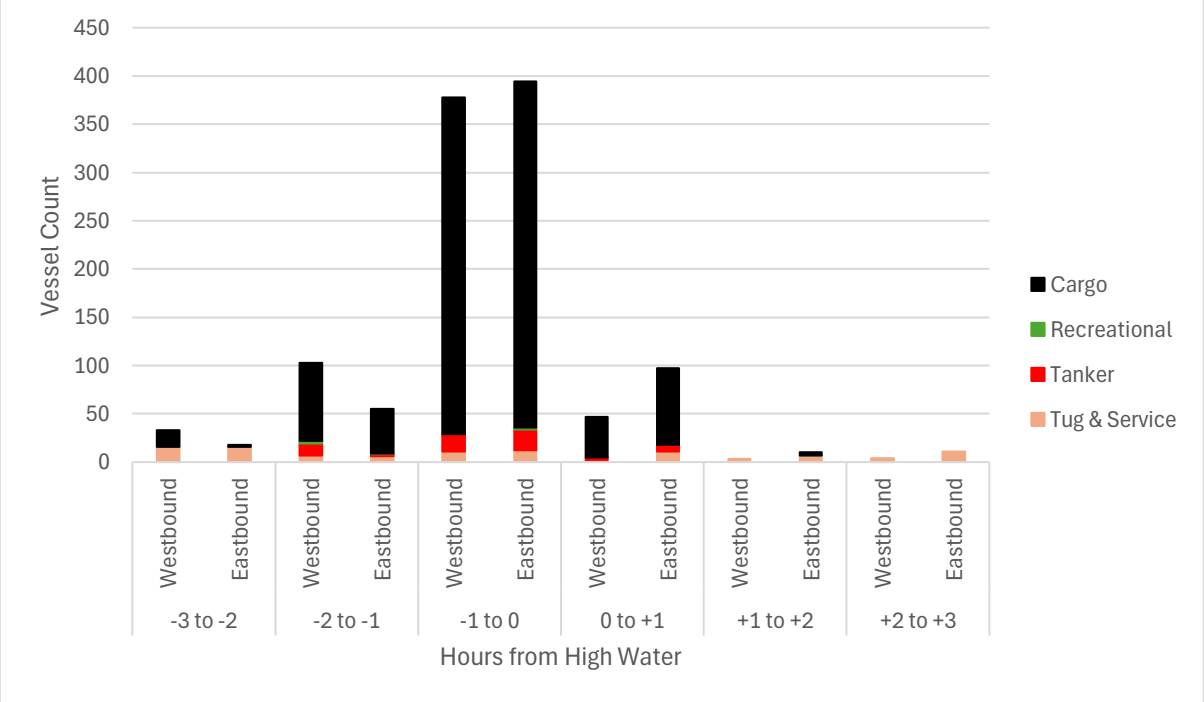
Image 4.3 – Vessels by Draught



Tidal Analysis

4.1.10 The movements of commercial vessels must be coordinated around the tidal window, and this is demonstrated in Image 4.4.

Image 4.4 – Tidal Transits on the River Ouse



4.1.11 The majority of transits occur one hour before high water (67% of total transits) and most of the transits are completed by cargo vessels (85% of total transits). This pattern occurs as these deeper draught vessels need sufficient water to navigate in safely. It is worth noting that data for transits that occurred more than three hours before and more than three hours after high water have not been shown here as the vessel count was negligible for these time periods.

Seasonality

4.1.12 Image 4.5 shows the annual trend of vessel movements on the Ouse. Data has been presented in the following way:

- Winter: December, January and February;
- Spring: March, April and May;
- Summer: June, July and August; and
- Autumn: September, October and November.

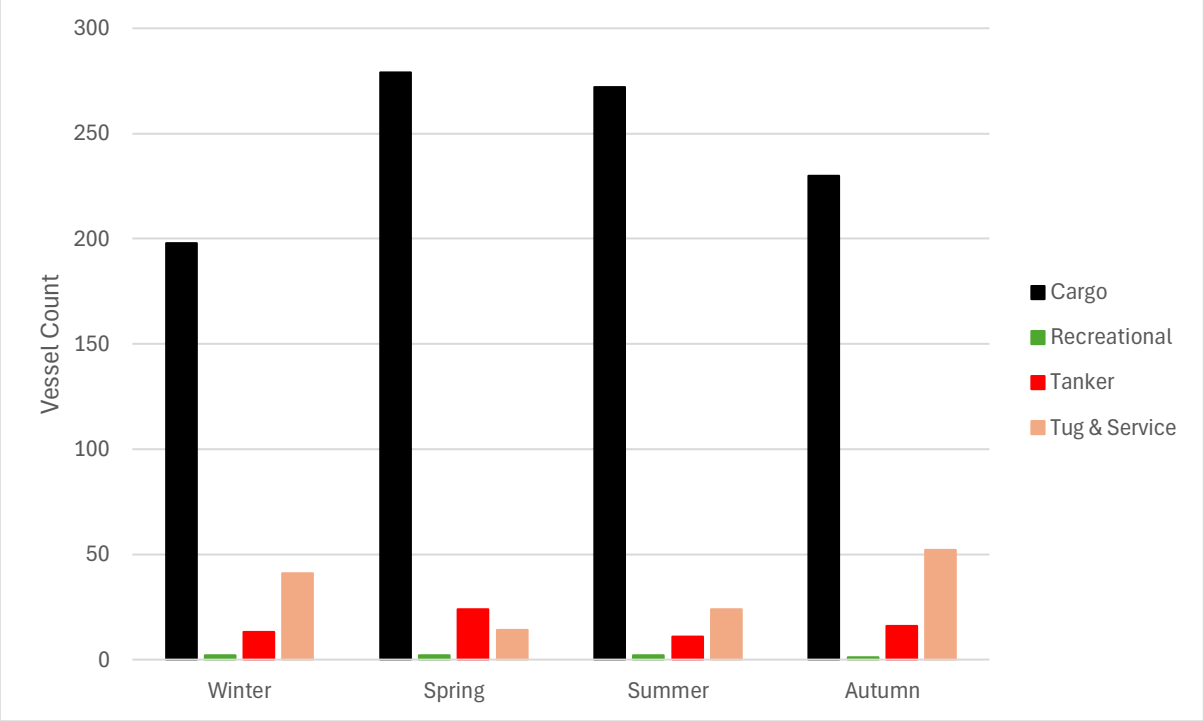
4.1.13 Cargo traffic is consistently the highest across all seasons, peaking in spring at just under 280 vessels and remaining similarly high in summer at around 270. This suggests a strong and relatively stable demand for cargo operations, with only a slight dip in autumn (approximately 230) and a more noticeable reduction in winter (around 200). The spring peak may indicate increased trade activity following the winter period.

4.1.14 Recreational vessel numbers are minimal in comparison potentially due to recreational users not carrying AIS, remaining close to zero across all seasons. There is a slight increase during the warmer months (spring and summer), which aligns with expected leisure boating patterns, but overall, this category contributes negligibly to total vessel traffic.

4.1.15 Tanker activity is modest but shows some seasonal fluctuation. The highest tanker count occurs in spring (around 25 vessels), followed by autumn (approximately 15–18), with lower values in winter and summer. This could reflect seasonal demand variations in liquid bulk transport, though the changes are relatively small in absolute terms.

4.1.16 Tug and service vessels exhibit a different trend, with the highest activity in autumn (just above 50 vessels), followed by winter (around 40). Activity is noticeably lower in spring and summer. This increase in autumn may be linked to heightened operational or maintenance support requirements as conditions begin to worsen.

Image 4.5 – Seasonality of Transits on the River Ouse



4.2 Boat movements on the Stainforth & Keadby Canal

4.2.1 The annual lockage report[19] for the Stainforth & Keadby Canal produced by the CRT, provides an indicative quantitative assessment of boating usage. Transit counts from Keadby Lock are shown in Table 4.1. Keadby lock is located approximately 4 km east of the OHL crossing and connects the Stainforth & Keadby Canal with the tidal, River Trent.

Table 4.1 – Annual Transit Counts at Keadby Lock

Year	2023	2024	2025	Annual Change (2024-25)
Keadby Lock Transits	719	400	597	+49%

4.2.2 For the years that data was available (shown in Table 4.1), annual lock transits decreased from 2023 to 2024 before increasing between 2024 and 2025 by approximately 49%. Historically, this canal was used by both commercial and leisure vessels, yet it has been confirmed through consultation that as of May 2026, only leisure vessels use this canal. It is worth noting that leisure craft such as paddleboarders or canoeists may be underreported in these statistics as such craft would not necessarily need to transit through the lock and instead use portage points along the canal bank to access and egress the water.

[19] https://canalrivertrust.org.uk/media/document/5q1ZBhYFeDYrm2RR21yBlw/XfPFgmmqM_z49dk6K2bAYrSF2cVFRkze7y651XbCoYU/aHR0cHM6Ly9jcnRwcm9kY21zdWtzMDEuYmxvYi5jb3JlLndpbmRvd3MubmV0L2RvY3VtZW50Lw/019c32f0-baf9-7275-97ba-634c7d584975.pdf

4.3 Boat movements on the Chesterfield Canal

4.3.1 The annual lockage report18 for the Chesterfield Canal produced by the CRT, provides an indicative quantitative assessment of boating usage. Transit counts from Gringley Lock are shown in Table 4.2. Gringley Lock is located approximately 0.7 km west of the OHL crossing.

Table 4.2 – Annual Transit Counts at Gringley Lock

Year	2023	2024	2025	Annual Change
Gringley Lock Transits	445	428	507	+18%

4.3.2 For the years that data was available (shown in Table 4.2), annual lock transits decreased from 2023 to 2024 before increasing between 2024 and 2025 by approximately 18% (Table 4). This canal is utilised by leisure vessels. It is worth noting that leisure craft such as paddleboarders or canoeists may be underreported in these statistics as such craft would not necessarily need to transit through the lock and instead use portage landings.

4.4 Market Weighton Canal & River Idle

4.4.1 It was not possible to ascertain any data recorded on the number of vessel movements on either the Market Weighton Canal or River Idle due to the low levels of navigational activity and absence of navigational authorities. The information provided in Section 3.4 and Section 3.5 means that the former is limited to infrequent usage by unpowered recreational craft and the latter is limited to infrequent usage by unpowered recreational craft with the potential of some powered craft transiting the watercourse.

5. Stakeholder Consultation

This section summarises the key consultation meetings undertaken to inform this NRA.

The purpose of the consultation was to:

- Identify any key navigation issues/hazards and potential risk control mitigation measures relating to the Proposed Development; and
- Validate the baseline navigational environment.

Consultation meetings were held with ABP Humber and CRT.

Summaries of the consultation meetings are presented in chronological order.

5.1 ABP

5.1.1 A Microsoft Teams meeting was held with ABP Humber held on 13 May 2026 between 13:00 and 14:00. The purpose of the meeting was to review the NRA scope and methodology in order to incorporate stakeholder feedback. In attendance were:

- **ABP Humber**
- **National Grid**
- **NASH Maritime**

5.1.2 Key points of discussion, relating to the NRA scope, are summarised below:

- Temporary reduced clearance, relative to when in operation, during construction requires river closures;
- Conductor stringing is the most critical activity. Temporary closures of the river will be required during stringing to ensure that river traffic is not at risk from contact with conductors and risk of dropped loads. Unlike shorter river crossings, it will not be feasible to install scaffold and protective nets
- Most AIS traffic occurs between HW-2 and HW+1, with typical transit near HW-1 at Blacktoft;
- Barges and pleasure craft operate outside peak tidal windows; data gaps exist, with ABP to share additional records; and
- Preferred working during neap tides, with signage and guard vessels during closures; overall navigation risk considered not significant with mitigation.

5.2 CRT

5.2.1 A Microsoft teams meeting was held with CRT on 14 May 2026 between 14:00 and 15:00. The purpose of the meeting was to review the NRA scope and methodology in order to incorporate stakeholder feedback. In attendance were:

- **CRT**
- **National Grid**

- **NASH Maritime**

5.2.2 Key points of discussion, relating to the NRA scope, are summarised below:

- Winter stoppages (Nov–Mar) must be agreed by the previous March and publicised for stakeholder consultation prior to acceptance. Shorter notice (~one month) is possible for night works;
- Stainforth & Keadby Canal: can likely be managed with short delays using spotters, avoiding full closure;
- Chesterfield Canal requires formal closure due to temporary bridge works; lower traffic levels but still requires structured closure and communication measures;
- Communication and user management are critical mitigation measures. This includes notices, signage, alerts, towpath control, lock closures, and spotters/safety boats to manage users safely; and
- Key requirement is clear, widespread advance communication rather than technical risk mitigation.

5.3 Market Weighton Canal and River Idle

5.3.1 No formal consultation took place for either the Market Weighton Canal or River Idle due to neither watercourse having a navigation authority.

6. Navigational Risk Assessment

6.1 Introduction

6.1.1 This assessment utilises a Simplified IALA Risk Assessment (SIRA) and to inform an understanding of the likelihood of contact, grounding and personal injury occurrence. The return periods identified are then blended with consequence modelling to derive the likelihood of most likely and worst credible hazard occurrences. The outcomes of this quantitative analysis are then blended with the subject matter expertise of the project team to identify suitable return periods for each identified navigation hazard in a most likely and worst-credible scenario.

6.1.2 Based on existing risk controls, a qualitative risk matrix (adopted from IALA SIRA) is utilised to identify the significance of each hazard, by scoring in terms of likelihood and consequence.

6.1.3 A description of the Formal Safety Assessment (FSA) process is as follows:

- **FSA Step 1:** Hazard Identification: The project team identifies navigation hazards related to defined and agreed assessment parameters, such as geographic areas, marine operation(s), or vessel type(s). This is achieved using a suite of quantitative (e.g., statistical vessel traffic analysis) and qualitative (e.g., consultation with key location stakeholders) techniques which enables an evidentially robust identification of navigation hazards;
- **FSA Step 2:** Risk Analysis: A detailed investigation of the causes, including the initiating events, and consequences of the hazards identified in Step 1 is undertaken. This is completed using a risk matrix, and enables ranking of hazards based on navigation risk, and a determination of hazard tolerability. This process allows attention to be focused upon higher-risk hazards enabling identification and evaluation of factors which influence the level of risk;
- **FSA Step 3 & 4:** Risk Controls Measures: The identification of existing risk controls measures (which are assumed to be embedded in the assessment of navigation risk), and the identification of additional risk controls, not currently in place for the assessment parameters. Additional risk control measures are identified based on prioritising mitigation of higher-risk hazards. During this stage the risk control measures are grouped into a defined and thought-out risk mitigation strategies; and
- **FSA Step 5: Findings:** The assessment findings are developed and documented into a technical report and then presented to the relevant decision makers in an auditable and traceable manner. The findings are based upon a comparison and a ranking of all hazards and their underlying causes; the comparison and ranking of risk control options as a function of associated costs and benefits; and the identification of those risk control options which mitigate hazards to acceptable or ALARP.

6.2 Scoring Criteria

6.2.1 The risk assessment process aims to ascertain risk levels and specify the requirement to apply measures to mitigate risk to lower levels. The methodology consists of four aspects:

- Likelihood parameters (Table 6.1) - the expected frequency for which hazards occur, presented as a return rate per year. Five likelihood bands were chosen from between one occurrence in one year to one occurrence in 1,000 years;
- Severity parameters (Table 6.2) – the expected consequence of each hazard were it to occur. This has been scored separately for consequences to people (loss of life), environment (pollution), property (damage) and business (reputational/economic impacts);
- Risk matrix (Table 6.3) – based on the likelihood and each of the four severity scorings, risk scores were derived using a risk matrix; and
- Risk classification (Table 6.4) - based on the resulting risk score, the risk was classified from 'Negligible' and 'Acceptable' through to 'High Risk' and 'Unacceptable'.

6.2.2 Each hazard was scored for the likelihood of occurrence and expected consequence (in terms of people, property, environment and business) for both a most likely and worst credible occurrence. Some hazards occur frequently with low consequence (minor injuries or damage), and less frequently with high consequence (loss of life / major pollution). The overall risk score was then the average of all the most likely risk scores, all the 'worst credible' risk scores and the highest individual scores from the most likely and 'worst credible' assessments.

Table 6.1 – Frequency of Occurrence Criteria

Rank	Description	Definition	Lower point	Upper point
1	Rare	<1 occurrence per 100 years	Every 100 years	Every 1,000 years
2	Unlikely	1 per 50 – 100 years	Every 50 years	Every 100 years
3	Possible	1 per 10 – 50 years	Every 10 years	Every 50 years
4	Likely	1 per 1 – 10 years	Yearly	Every 10 years
5	Almost Certain	Yearly	Yearly	Yearly

Table 6.2 – Severity of Consequence Criteria and Categories

Rank	Description	Definition			
		People	**Property**	**Environment**	**Business**
1	Negligible	No Perceptible Impact	No Perceptible Impact or less than £10,000	No Perceptible Impact	No Perceptible Impact
2	Minor	Slight injury(s)	£10,000-£100,000	Tier 1 Local assistance required	Local negative publicity, short term loss of revenue
3	Moderate	Multiple minor or single serious injury	£100,000-£1million	Tier 2 Limited external assistance required	Widespread negative publicity, temporary suspension of activities
4	Serious	Multiple serious injury or single fatality	£1million-£10million	Tier 2 Regional assistance required	National negative publicity, prolonged closure or restrictions
5	Major	More than one fatality	>£10million	Tier 3 National assistance required	International negative publicity, serious disruption to operations

Table 6.3 – Risk Matrix

Risk Matrix							
Severity of consequences	Major	5	5	10	15	20	25
	Serious	4	4	8	12	16	20
	Moderate	3	3	6	9	12	15
	Minor	2	2	4	6	8	10
	Negligible	1	1	2	3	4	5
			1	2	3	4	5
			Rare	Unlikely	Possible	Likely	Almost Certain

Table 6.4 – Risk Classification

Hazard Risk Score	Hazard Risk Rating	Tolerability
1-3.99	Negligible Risk	Broadly Acceptable
4-7.99	Low Risk	Broadly Acceptable
8-14.99	Medium Risk	Tolerable (if ALARP)
15-19.99	Significant Risk	Unacceptable
20-25	High Risk	Unacceptable

6.3 Hazard Identification

6.3.1 The findings of the baseline navigation characterisation were combined to define vessel types (Table 6.5) and hazard categories (Table 6.6). Based on the fact that a formal closure of the River Ouse is required, commercial vessels (e.g. cargo and tankers) and those providing port services (tug & service vessels) have been scoped out of the assessment. This is ensuring a realistic understanding of potential hazards posed during the Proposed Development with a closure of the River Ouse in place.

Table 6.5 – Vessel Types

Vessel Type	Vessel Types / Receptors
Safety Boat	Likely to be a Rigid Hull Inflatable Boat (RHIB)
Recreational Vessel (Powered)	Sailing Yachts, Motor Yachts etc.
Recreational Vessel (Unpowered)	SUP, Kayak, Canoe etc.
Narrowboat	Flat bottomed cruising barges (≤21m LOA), typically powered by a small inboard engine and direct tiller steered with a small rudder

Table 6.6 – Hazard Categories

Hazard #	Hazard Types	Definition
1	Contact (Allision)	Vessel makes contact with Fixed or Floating Object (FFO) (e.g. temporary bridge or power cable)
2	Grounding	Vessel makes contact with the riverbed.
3	Personal Injury	River/Canal user suffers an injury as a result of the works taking place (e.g. dropped object strikes a user).

6.4 Proposed Mitigation

6.4.1 Following a review of the Proposed Development design, baseline navigation characterisation, vessel traffic analysis and stakeholder consultation, the project team have produced a variety of project-specific risk controls, in addition to the baseline risk controls described in Section 2, to ensure safe navigation during the establishment of the OHL. In no order of priority, these can be seen in Table 6.7. Not all risk controls listed in Table 6.7 have been identified as being relevant to every watercourse, relevant risk controls have been applied on a case-by-case basis.

Table 6.7 – Master List of Risk Controls

ID	Title	Detail
1	Watercourse Closure	Formal closure of the navigation arranged through liaison with the relevant navigation authority.
2	Local Notices to Mariners	Bulletin issued by ABP to inform boaters of critical, up-to-date safety and navigational information.
3	Liaison with Relevant Authority	Communications with the relevant authority to provide adequate notice of the works and initiate relevant risk controls e.g. signage, closure, spotters etc.
4	Safety Boats	Likely a Rigid Hull Inflatable Boats (RHIB) to manage vessel traffic on the River Ouse. One boat stationed at Blacktoft Reach Beacon (eastern extent), and one located at Whitgift Roads Beacon (western extent).
5	Signage	Physical signage located at the appropriate distance from the works to inform watercourse users of the works.
6	Online Alerts	Particularly referring to the Canal & River Trust's online alert system to promulgate information regarding closures and works.
7	Spotters	Individuals to be stationed at the appropriate distance, along the specific watercourse, in order to inform and promulgate information on the closure.
8	Stakeholder Engagement	Promulgation of information regarding the works and associated closures to raise awareness amongst watercourse users (e.g. online user groups).

River Ouse

6.4.2 The risk controls relevant to the River Ouse are shown in Table 6.8. Due to the nature of the works, discussed in Section 1.1, the crossing of the Ouse will require a formal closure of the watercourse which will entail suspension of all commercial traffic through liaison with ABP.

6.4.3 As part of this closure, ABP will issue a NtM (ID 2 Table 6.8) – a bulletin to inform boaters of critical, up-to-date safety and navigational information. Both ID 1 and 2 in Table 6.8 will ensure that ID 3 and ID 8 are achieved. These measures are all part of baseline risk controls outlined in Section Baseline Risk Controls.

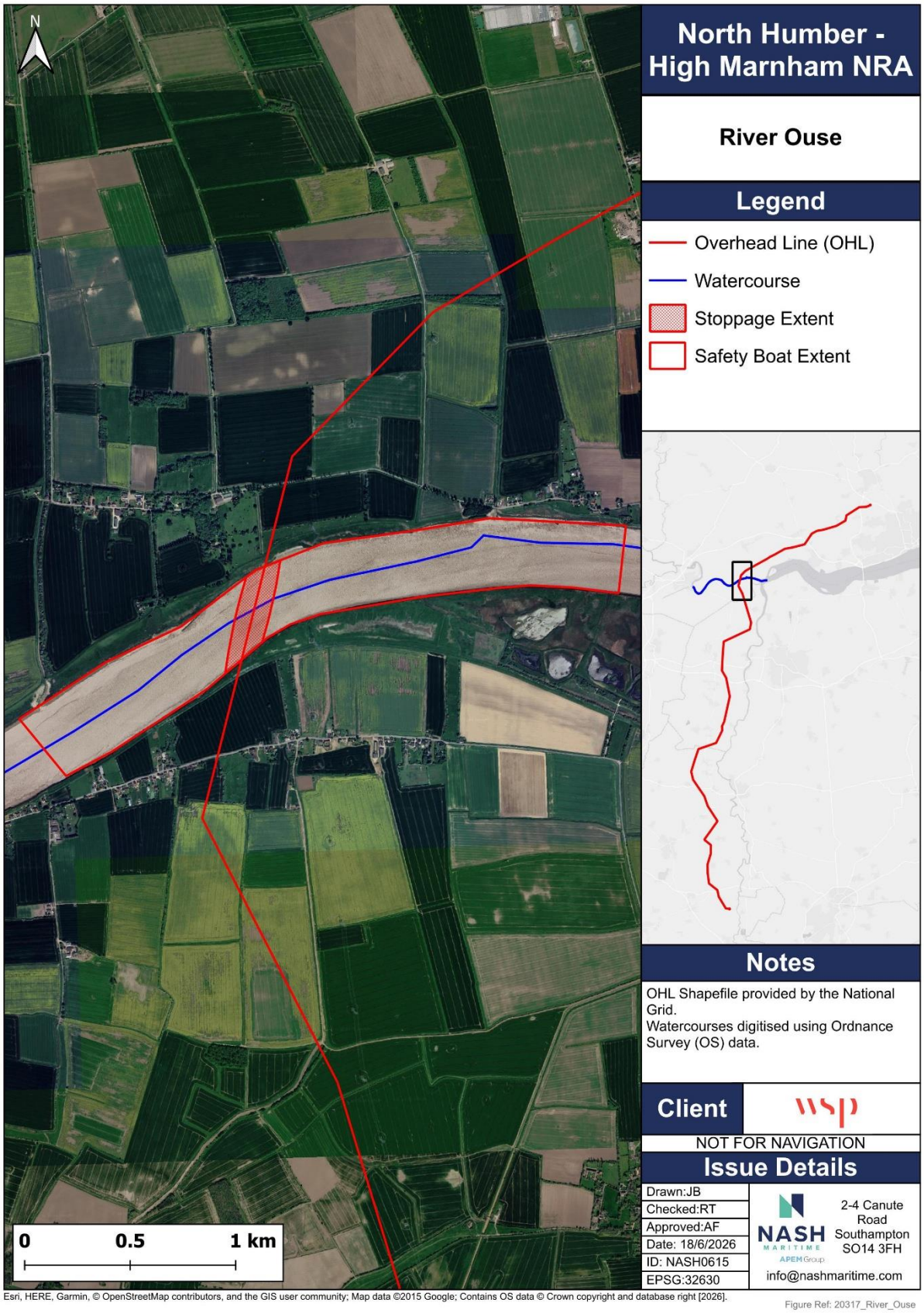
6.4.4 ID 4 (Table 6.8) is a project-specific risk control and pertains to the mobilisation of two safety boats, likely to be Rigid Hull Inflatable Boats (RHIB). These vessels will be utilised to manage vessel traffic, specifically recreational users that are least likely to be aware of the works occurring. The indicative positions of the safety boats can be seen in Image 6.1.

Table 6.8 – River Ouse Risk Controls

ID	Title	Detail
1	Watercourse Closure	Formal closure of the water crossing arranged through liaison with the relevant authority.
2	Notice to Mariners	Bulletin issued by ABP to inform boaters of critical, up-to-date safety and navigational information.
3	Liaison with Relevant Authority	Communications with the relevant authority to provide adequate notice of the works and initiate relevant risk controls e.g. signage, closure, spotters etc.
4	Safety Boats	Likely a Rigid Hull Inflatable Boat (RHIB) to manage vessel traffic on the River Ouse. One boat stationed at Blacktoft Reach Beacon (eastern extent), and one located at Whitgift Roads Beacon (western extent).
8	Stakeholder Engagement	Promulgation of information regarding the works and associated closures to raise awareness amongst watercourse users (e.g. online user groups).

6.4.5 Image 6.1 shows the stoppage extents for the River Ouse. Closure to navigation is present within the limits of deviation (±80 m) as the OHL will drop below safe clearance for vessels to pass. Further beyond the OHL, safety boats are to be positioned at Blacktoft Reach lateral mark (eastern extent), and one located at Whitgift Roads lateral mark (western extent) to inform traffic of closure. The former is located approximately 1.76 km from the OHL and the latter is located approximately 1.18 km from the OHL (Image 6.1).

Image 6.1 – Proposed Overhead Line with River Ouse Stoppage Extents



Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community; Map data ©2015 Google; Contains OS data © Crown copyright and database right [2026].

Figure Ref: 20317_River_Ouse

Stainforth & Keadby Canal

6.4.6 The risk controls relevant to the Stainforth & Keadby Canal are shown in Table 6.9. In the case of this watercourse, ID 3 in Table 6.9 refers to cooperation with CRT as the navigation authority.

6.4.7 ID 5 in Table 6.9 relates to installing physical signage to inform watercourse users of the works which can be arranged with CRT. ID 6, in Table 6.9, is unique to the CRT-owned and managed watercourses and relates to specific mobile phone notifications regarding works that can be received by users through the creation of a 'MyTrust' online account[20]. The application of this risk control will ensure that ID 8 is applied also. The risk controls discussed above are in line with the baseline risk controls discussed in Section Baseline Risk Controls.

6.4.8 Project specific risk controls included spotters (ID 7) being placed at ±200 m from the OHL to further inform watercourse users of the closure and minimise navigation risk (ID 7 in Table 6.9).

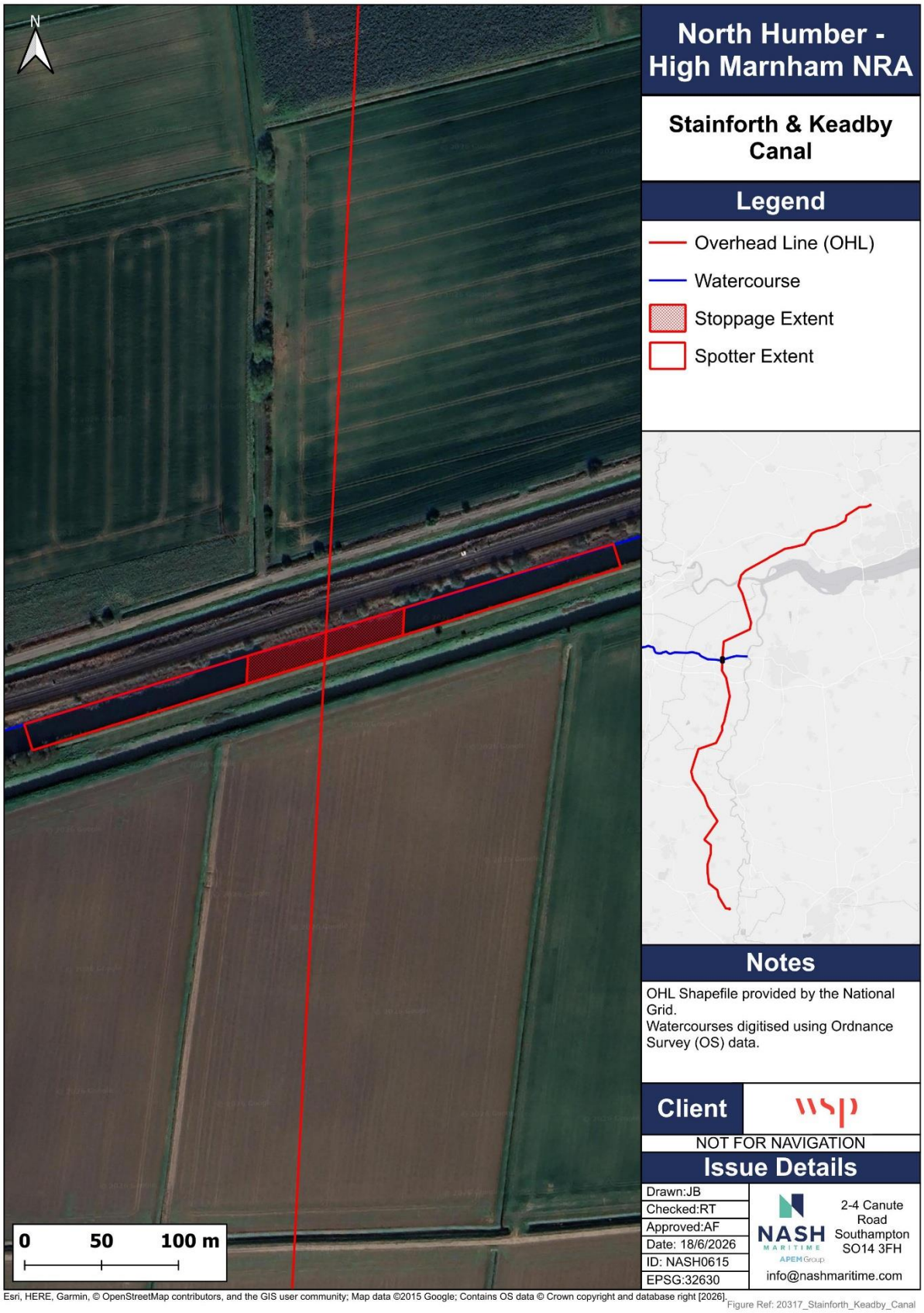
Table 6.9 – Stainforth & Keadby Canal Risk Controls

ID	Title	Detail
3	Liaison with Relevant Authority	Communications with the relevant authority to provide adequate notice of the works and initiate relevant risk controls e.g. signage, closure, spotters etc.
5	Signage	Physical signage located at the appropriate distance from the works to inform watercourse users of the works.
6	Online Alerts	Particularly referring to the Canal and River Trust online alert system to promulgate information regarding closures and works.
7	Spotters	Individuals to be stationed at the appropriate distance, along the specific watercourse, in order to inform and promulgate information on the closure.
8	Stakeholder Engagement	Promulgation of information regarding the works and associated closures to raise awareness amongst watercourse users (e.g. online user groups).

6.4.9 Image 6.2 shows the stoppage extents for the Stainforth & Keadby Canal. Closure to navigation is present within the limits of deviation (±50 m) to reduce risk of works to watercourse users. Further beyond the OHL, at (±200 m) the spotter extent highlights the position at which personnel should be present to inform watercourse users of the closure.

[20] https://canalrivertrustb2c.b2clogin.com/canalrivertrustb2c.onmicrosoft.com/B2C_1A_signup_signin/oauth2/v2.0/authorize?state=f3fd599f-fafd-4879-b080-cedbef70d06a&response_type=code&approval_prompt=auto&scope=openid&redirect_uri=https%3A%2F%2Fmytrust.canalrivertrust.org.uk%2Fauth%2Flogin&client_id=e2964458-1156-4088-912d-d27ef462d32b

Image 6.2 – Proposed Overhead Line with Stainforth & Keadby Canal Stoppage Extents



Chesterfield Canal

6.4.10 The risk controls relevant to the Chesterfield Canal are shown in Table 6.10. Due to the nature of the works, discussed in Section 1.1, the crossing of the Chesterfield Canal will require a formal closure of the watercourse (ID 1 in Table 6.10) due to the deployment of a temporary bridge. This can be arranged with CRT and a formal request will need to be made. Such a closure will help cover off ID 3 (Table 6.10) too.

6.4.11 ID 5 in Table 6.10 includes installing physical signage to inform watercourse users of the works. Unlike the other watercourse discussed, signage will be more effective if placed at the nearest turning points for vessels (winding holes) due to the formal closure that will be present. The locations of this signage can be seen in Image 6.3. As with the Stainforth & Keadby Canal, the MyTrust mobile notification system (ID 6) can be utilised to inform users thereby covering ID 8 as well.

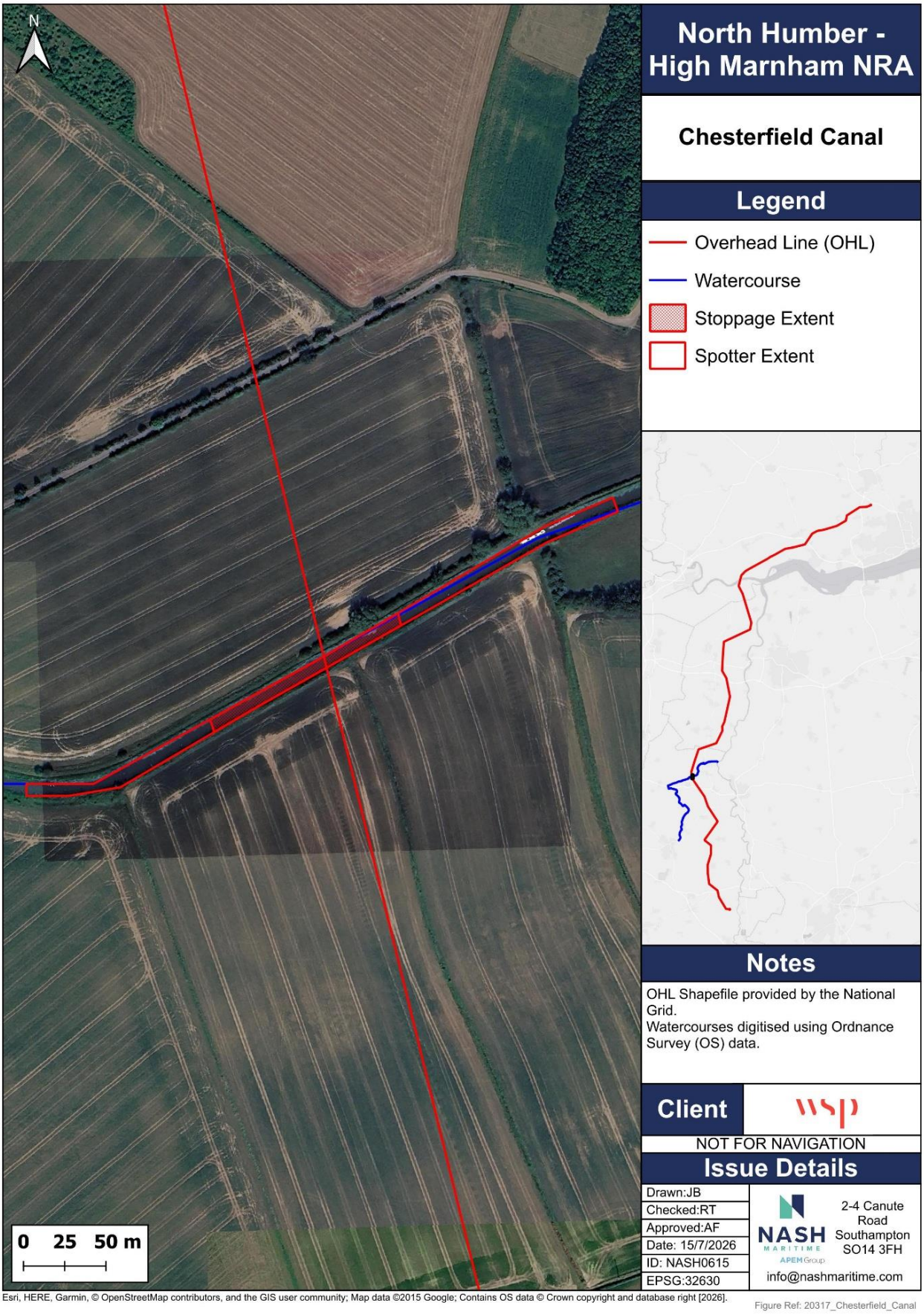
6.4.12 In addition to the baseline risk controls (Section Baseline Risk Controls) discussed above, spotters should also be placed ±200 m from the OHL to inform watercourse users of the formal closure and minimise navigation risk (ID 7 in Table 6.10).

Table 6.10 – Chesterfield Canal Risk Controls

ID	Title	Detail
1	Watercourse Closure	Formal closure of the water crossing arranged through liaison with the relevant authority.
3	Liaison with Relevant Authority	Communications with the relevant authority to provide adequate notice of the works and initiate relevant risk controls e.g. signage, closure, spotters etc.
5	Signage	Physical signage located at the appropriate distance from the works to inform watercourse users of the works.
6	Online Alerts	Particularly referring to the Canal and River Trust online alert system to promulgate information regarding closures and works.
7	Spotters	Individuals to be stationed at the appropriate distance, along the specific watercourse, in order to inform and promulgate information on the closure.
8	Stakeholder Engagement	Promulgation of information regarding the works and associated closures to raise awareness amongst watercourse users (e.g. online user groups).

6.4.13 Image 6.3 shows the stoppage extents for the Chesterfield Canal. Closure to navigation is present within the limits of deviation (±50 m) to the eastern extent and to the Red Line Boundary (RLB) at the western extent (Image 6.3), due to the presence of the temporary bridge. Further beyond the OHL, at (±200 m) the spotter extent highlights the position at which personal should be present to inform watercourse users of the closure.).

Image 6.3 – Proposed Overhead Line with Chesterfield Canal Stoppage Extents



6.4.14 Image 6.4 shows the signage extents for the Chesterfield Canal. These relate to the nearest winding holes where a vessel would be able to turn around and avoid being stuck on the section of the canal between the horizontal limits of deviation and the Winding Hole due to the formal watercourse closure. Signage is to be positioned at Manor Farm winding hole (eastern extent), and at Drakeholes Tunnel Visitor Mooring (western extent) to inform vessels of closure. The former is located approximately 1.68 km from the OHL and the latter is located approximately 4.77 km from the OHL (Image 6.4).

Image 6.4 – Proposed Overhead Line with Chesterfield Canal Signage Extents

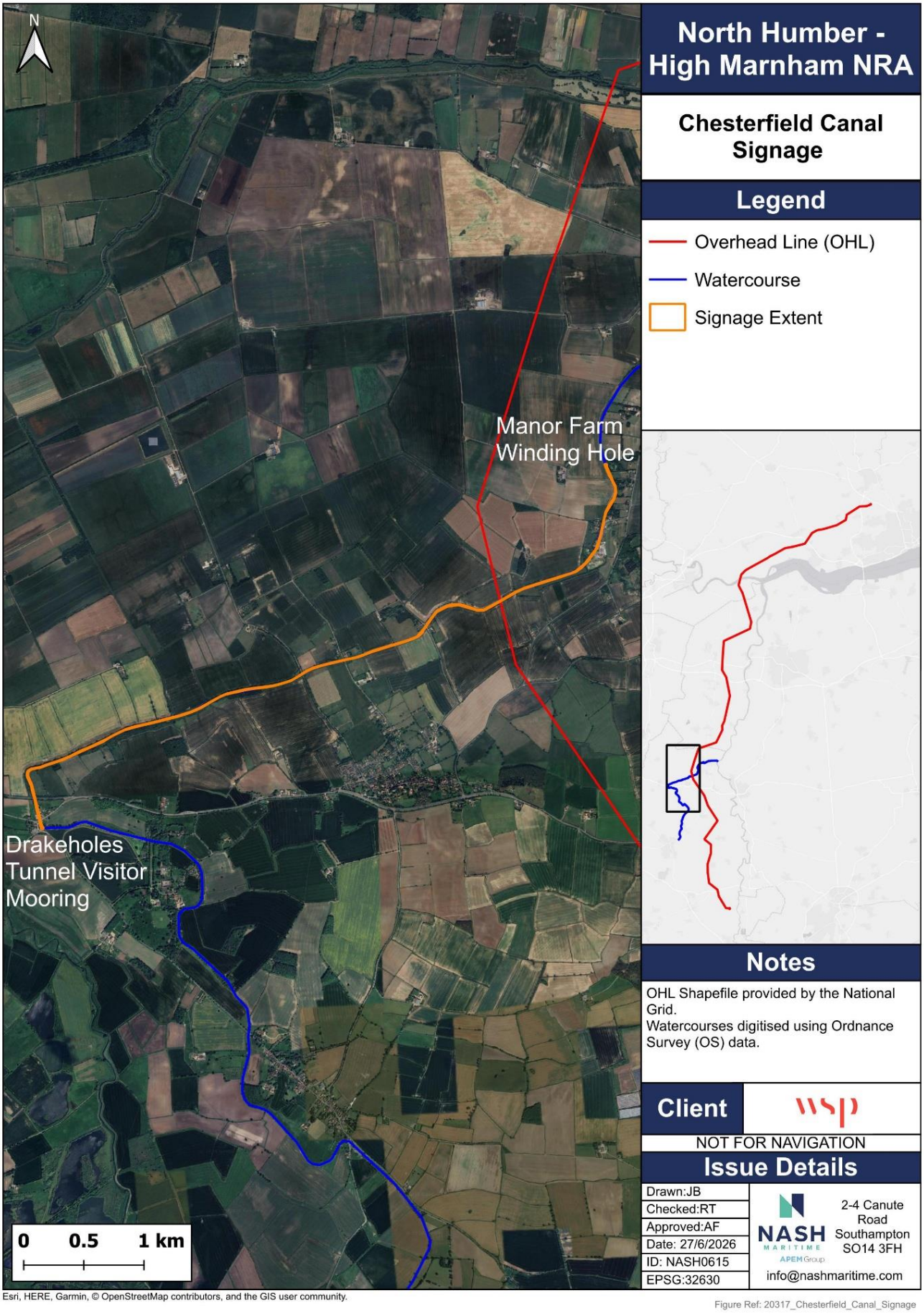


Figure Ref: 20317_Chesterfield_Canal_Signage

Market Weighton Canal

6.4.15 The Market Weighton Canal has no baseline risk controls due to the absence of a navigation authority. Therefore, all risk controls discussed here are deemed to be project specific. The risk controls relevant to the Market Weighton Canal are shown in Table 6.11.

6.4.16 In the case of this watercourse, ID 3 in Table 6.11 refers to cooperation with the IDB as the landowner for areas adjacent to the watercourse to inform them of the works, including the erection of a temporary bridge at bank level. ID 5 in Table 6.11 relates to installing physical signage to inform watercourse users of the works.

6.4.17 Signage (ID 5) could be placed ±200 m from the OHL stating that navigation is closed within the horizontal limits of deviation and would require organisation with the IDB as the landowner. Spotters should also be placed at the same distances to further inform watercourse users the closure and minimise navigation risk (ID 7 in Table 6.11).

6.4.18 The final risk control applied (ID 8 in Table 6.11**)** relates to further promulgation of information through online circulation with the aim of making users aware prior to them becoming afloat. This could be achieved through liaison with Inland Waterways (IWA) who circulate news articles relating to the Market Weighton Canal on their website[21].

Table 6.11 – Market Weighton Canal Risk Controls

ID	Title	Detail
3	Liaison with Relevant Authority	Communications with the relevant authority to provide adequate notice of the works and initiate relevant risk controls e.g. signage, closure, spotters etc.
5	Signage	Physical signage located at the appropriate distance from the works to inform watercourse users of the works.
7	Spotters	Individuals to be stationed at the appropriate distance, along the specific watercourse, in order to inform and promulgate information on the closure.
8	Stakeholder Engagement	Promulgation of information regarding the works and associated closures to raise awareness amongst watercourse users (e.g. online user groups).

6.4.19 Image 6.5 shows the stoppage extents for the Market Weighton Canal. Closure to navigation is present within the limits of deviation (±50 m) to the southern extent and to the RLB at the northern extent (Image 6.5), as the temporary bridge will be positioned inside this boundary with limited clearance for watercourse users to pass. Further beyond the OHL, at (±200 m) the spotter extent highlights the position at which personal should be present to inform watercourse users of the closure.

[21] https://waterways.org.uk/waterways/discover-the-waterways/market-weighton-canal#

Image 6.5 – Proposed Overhead Line with Market Weighton Canal Stoppage Extents

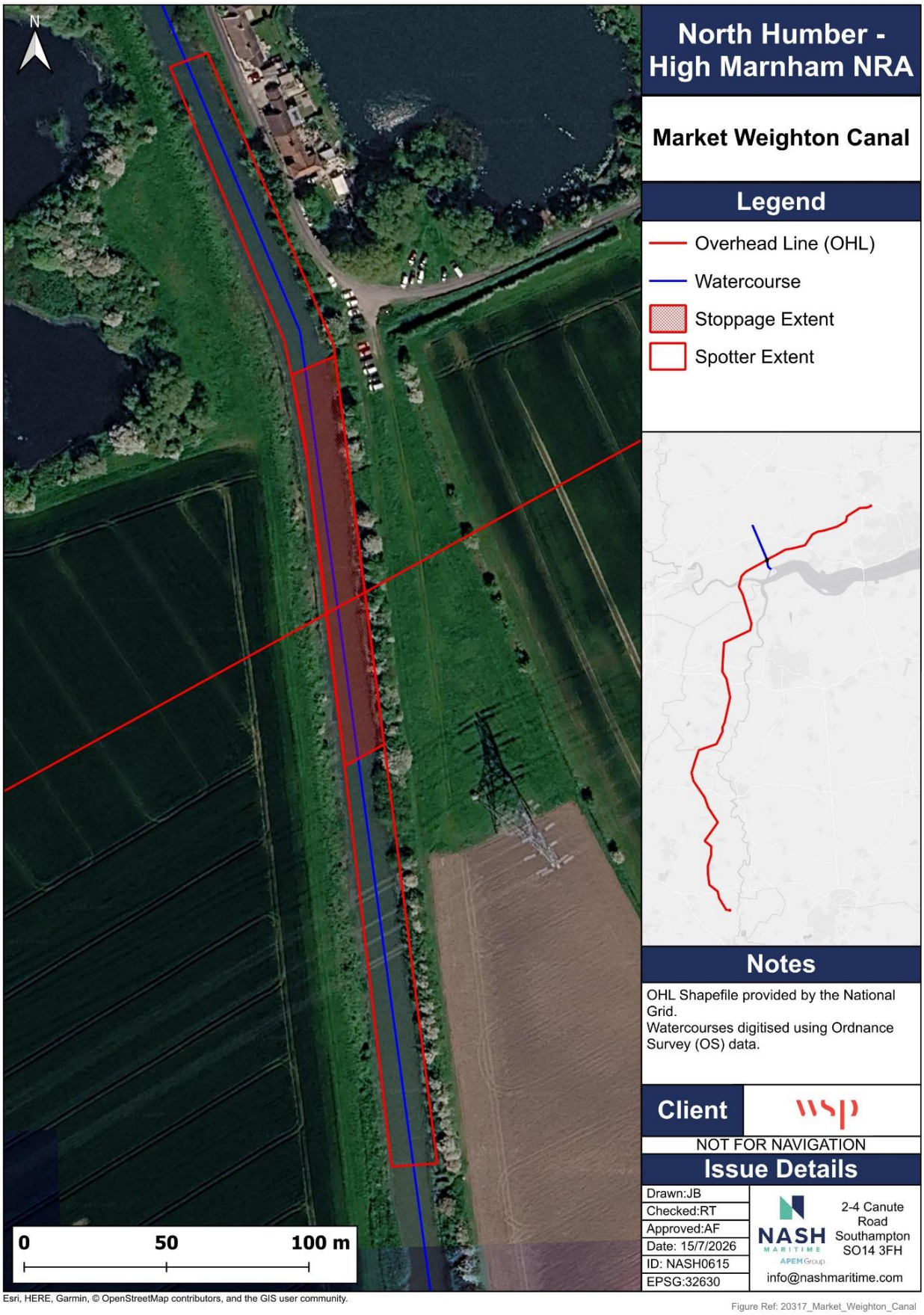


Figure Ref: 20317_Market_Weighton_Canal

River Idle

6.4.20 The River Idle has no baseline risk controls due to the absence of a navigation authority. Therefore, all risk controls discussed here are deemed to be project specific. These risk controls, relevant to the River Idle are shown in Table 6.12.

6.4.21 In the case of this watercourse, ID 3 in Table 6.12, refers to cooperation with the EA as owners of a tidal sluice gate at West Stockwith which permits access to the River Idle from the River Trent.

6.4.22 ID 5 in Table 6.12 relates to installing physical signage to inform watercourse users of the works. Signage can be placed ±200 m from the OHL stating that navigation is closed within the horizontal limits of deviation. Spotters should also be placed at the same distances to further inform watercourse users the closure and minimise navigation risk (ID 7 in Table 6.12).

6.4.23 The final risk control applied (ID 8 in Table 6.12) relates to further promulgation of information through online circulation with the aim of making users aware prior to them becoming afloat. Again, as for the Market Weighton Canal, this could be achieved through communication with the IWA[22].

Table 6.12 – River Idle Risk Controls

ID	Title	Detail
3	Liaison with Relevant Authority	Communications with the relevant authority to provide adequate notice of the works and initiate relevant risk controls e.g. signage, closure, spotters etc.
5	Signage	Physical signage located at the appropriate distance from the works to inform watercourse users of the works.
7	Spotters	Individuals to be stationed at the appropriate distance, along the specific watercourse, in order to inform and promulgate information on the closure.
8	Stakeholder Engagement	Promulgation of information regarding the works and associated closures to raise awareness amongst watercourse users (e.g. online user groups).

6.4.24 Image 6.6 shows the stoppage extents for the River Idle. Closure to navigation is present within the limits of deviation (±50 m) to protect potential watercourse users. Further beyond the OHL, at (±200 m) the spotter extent highlights the position at which personal should be present to inform watercourse users of the closure.

[22] https://waterways.org.uk/waterways/discover-the-waterways/river-idle

Image 6.6 – Proposed Overhead Line with River Idle Stoppage Extents

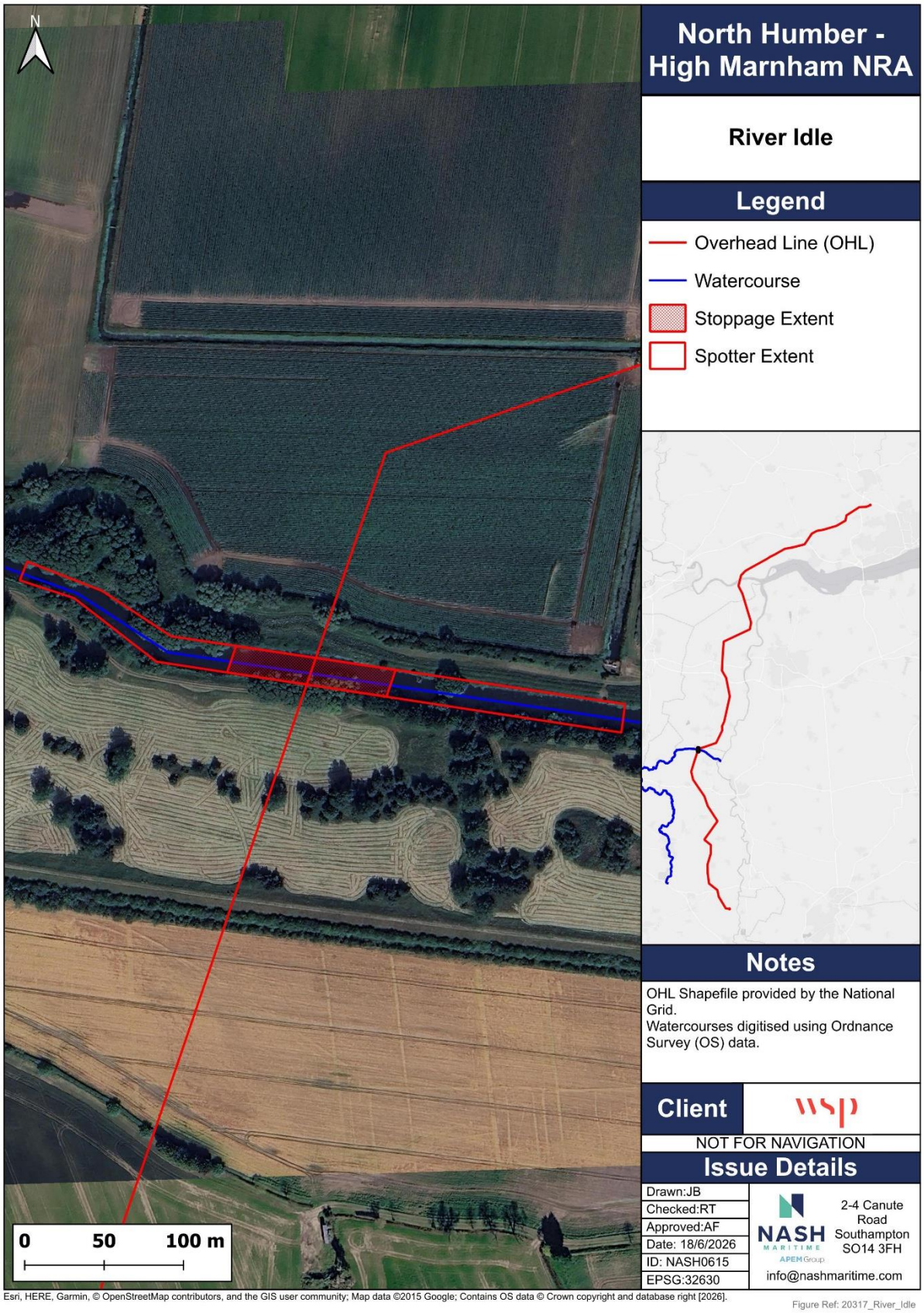


Figure Ref: 20317_River_Idle

6.5 Results

River Ouse

6.5.1 The River Ouse presents the highest overall risk of all assessed watercourses (Table 6.13), primarily due to the high volume and diversity of vessel traffic, even with the commercial closure implemented by ABP.

6.5.2 Recreational craft are considered the most unpredictable, and therefore personal injury and grounding risks for these users are scored highest. Unpowered recreational craft and narrowboats follow, with reduced risk scores reflecting their lower operating speeds.

6.5.3 Safety boat users are assigned lower personal injury risk due to their awareness of the works and ability to respond proactively. Additionally, safety boats and narrowboats are considered less likely to ground due to their relatively shallow draught. Contact with the works is ranked as the lowest hazard on this watercourse, as there is no temporary bridge structure increasing contact risk.

Table 6.13 – River Ouse Hazard Scores

ID	Baseline Rank	Hazard Title	Baseline Risk	
			Score	Rating
9	1	Personal Injury: Recreational Vessel (Powered)	7.8	Low Risk - Broadly Acceptable
6	2	Grounding: Recreational Vessel (Powered)	7.6	Low Risk - Broadly Acceptable
10	3	Personal Injury: Recreational Vessel (Unpowered)	7.1	Low Risk - Broadly Acceptable
11	3	Personal Injury: Narrowboat	7.1	Low Risk - Broadly Acceptable
8	5	Personal Injury: Safety Boat	5.8	Low Risk - Broadly Acceptable
5	6	Grounding: Safety Boat	4.4	Low Risk - Broadly Acceptable
7	7	Grounding: Narrowboat	4.3	Low Risk - Broadly Acceptable
2	8	Contact (Allision): Recreational Vessel (Powered)	1.9	Negligible Risk - Broadly Acceptable
4	8	Contact (Allision): Narrowboat	1.9	Negligible Risk - Broadly Acceptable
1	10	Contact (Allision): Safety Boat	1.9	Negligible Risk - Broadly Acceptable
3	10	Contact (Allision): Recreational Vessel (Unpowered)	1.9	Negligible Risk - Broadly Acceptable

Stainforth & Keadby Canal

6.5.4 For the Stainforth & Keadby Canal, only unpowered recreational craft and narrowboats have been scoped into the assessment (Table 6.14). The absence of a temporary bridge reduces the likelihood of vessel contact with the works for both vessel types. Similarly, the risk of personal injury from dropped objects is lower due to the reduced overhead interaction. Overall, this canal has negligible risk scores (Table 6.14).

Table 6.14 – Stainforth & Keadby Canal Hazard Scores

ID	Baseline Rank	Hazard Title	Baseline Risk	
			Score	Rating
10	1	Personal Injury: Recreational Vessel (Unpowered)	3.0	Negligible Risk - Broadly Acceptable
4	2	Contact (Allision): Narrowboat	1.9	Negligible Risk - Broadly Acceptable
11	3	Personal Injury: Narrowboat	1.9	Negligible Risk - Broadly Acceptable
3	4	Contact (Allision): Recreational Vessel (Unpowered)	1.8	Negligible Risk - Broadly Acceptable

Chesterfield Canal

6.5.5 The risk scores for the Chesterfield Canal are shown in Table 6.15. The presence of a temporary bridge increases both the risk of contact with infrastructure and the likelihood of personal injury from dropped objects for these users. In addition, narrowboats are included due to the canal's operational status. However, their associated risk is considered lower than that for unpowered recreational users, as control measures such as signage reduce the likelihood of interaction with the works. Furthermore, unpowered users (e.g. kayakers and canoeists) are more likely to enter the water at informal access points closer to the works, increasing their relative exposure to risk.

Table 6.15 – Chesterfield Canal Hazard Scores

ID	Baseline Rank	Hazard Title	Baseline Risk	
			Score	Rating
10	1	Personal Injury: Recreational Vessel (Unpowered)	5.1	Low Risk - Broadly Acceptable
3	2	Contact (Allision): Recreational Vessel (Unpowered)	3.1	Negligible Risk - Broadly Acceptable
4	3	Contact (Allision): Narrowboat	2.4	Negligible Risk - Broadly Acceptable
11	4	Personal Injury: Narrowboat	1.9	Negligible Risk - Broadly Acceptable

Market Weighton Canal

6.5.6 Only unpowered recreational vessels have been scoped into the assessment for the Market Weighton Canal (Table 6.16). This is because powered craft are unlikely to use this watercourse due to the absence of navigation rights and charge associated with transiting through the Humber Lock. However, the presence of the temporary bridge, set at bed level, increases the likelihood of interaction between unpowered recreational craft and the infrastructure. As a result, both the risk of an unpowered craft contacting the works and the potential for personal injury from dropped objects are elevated compared to similar low-use watercourses, which is reflected in the risk scores presented in Table 6.16.

Table 6.16 – Market Weighton Canal Hazard Scores

ID	Baseline Rank	Hazard Title	Baseline Risk	
			Score	Rating
10	1	Personal Injury: Recreational Vessel (Unpowered)	5.1	Low Risk - Broadly Acceptable
3	2	Contact (Allision): Recreational Vessel (Unpowered)	3.1	Negligible Risk - Broadly Acceptable

River Idle

6.5.7 The River Idle risk scores are shown in Table 6.17. Vessel traffic is very limited, and the absence of a temporary bridge significantly reduces both contact risk and the potential for injury from falling objects. Consequently, hazard scores remain low (Negligible Risk) across all categories.

Table 6.17 – Market Weighton Canal Hazard Scores

ID	Baseline Rank	Hazard Title	Baseline Risk	
			Score	Rating
10	1	Personal Injury: Recreational Vessel (Unpowered)	3.0	Negligible Risk - Broadly Acceptable
4	2	Contact (Allision): Narrowboat	1.9	Negligible Risk - Broadly Acceptable
11	3	Personal Injury: Narrowboat	1.9	Negligible Risk - Broadly Acceptable
3	4	Contact (Allision): Recreational Vessel (Unpowered)	1.8	Negligible Risk - Broadly Acceptable

7. Conclusions and Recommendations

7.1 Conclusions

7.1.1 This NRA has considered the likely interaction between construction activities associated with the Proposed Development and navigation across five watercourses. The assessment demonstrates that risk levels are primarily influenced by the volume of vessel traffic, watercourse characteristics, and the presence of temporary infrastructure during construction.

7.1.2 The River Ouse presents the highest relative level of navigational risk due to the volume and diversity of vessel traffic, including powered recreational craft and the influence of tidal conditions. Consequently, hazards relating to personal injury and grounding are most prominent at this location. However, the implementation of a formal watercourse closure, supported by Notices to Mariners and safety boat deployment, significantly reduces the likelihood of vessel interaction with the works.

7.1.3 In contrast, the Stainforth & Keadby Canal and River Idle represent the lowest risk environments. These low-risk scores are driven by the absence of temporary bridge structures, resulting in predominantly negligible risk scores. Hazards are limited primarily to low-consequence interactions involving unpowered recreational craft and powered boats (e.g. narrowboats), both of which are well managed through the risk controls discussed.

7.1.4 The Market Weighton Canal and Chesterfield Canal present moderate relative risk compared to the other watercourses due to the introduction of temporary bridge structures. These features increase the likelihood of vessel contact and personal injury from dropped objects, particularly for unpowered recreational users. Despite this, overall risk remains low to negligible due to the application of appropriate mitigation measures.

7.1.5 Across all watercourses, the risk assessment demonstrates that identified hazards fall within “Negligible” to “Low” risk categories and are therefore considered broadly acceptable. Where risks are higher relative to others (e.g. River Ouse), they remain tolerable provided that mitigation measures (such as those summarised in Section 6.4) are implemented in line with ALARP principles. As such, no additional risk controls further to those discussed in this report are required for the Proposed Development.

7.2 Recommendations

7.2.1 The following recommendations are made to ensure that navigational risks remain controlled throughout the construction phase:

- **Implementation of Formal Closures Where Required**
  - Maintain the planned formal closure of the River Ouse during critical construction activities;
  - Ensure closure of the Chesterfield Canal is agreed with the CRT and programmed appropriately where practicable and feasible to do so;

- **Communication and Notification**
  - Issue Local Notices to Mariners (via ABP) and CRT stoppage notices well in advance of works;
  - Utilise CRT's online alert systems and stakeholder engagement channels to ensure comprehensive user awareness; and
  - Ensure consistency between all communication methods (signage, online alerts, and stakeholder engagement).
- **On-Water and On-Site Control Measures**
  - Deploy safety boats on the River Ouse to actively manage and inform recreational users approaching the closure extents; and
  - Position trained spotters at appropriate distances (typically ±200 m from the works) on canal and river sections where closures or restrictions are in place.
- **Signage Strategy**
  - Install clear and visible signage upstream and downstream of all works areas; and
  - On the Chesterfield Canal, position signage at key decision points (e.g. winding holes) to prevent vessels entering closed sections.
- **Programming and Coordination**
  - Where feasible, align works with periods of reduced navigation activity (e.g. winter months for CRT canals, neap tides for the River Ouse); and
  - Continue liaison with ABP, CRT, and other stakeholders to refine construction timing and mitigation measures.

7.3 Summary

7.3.1 In summary, the assessment concludes that the navigational risks associated with the Proposed Development are low and manageable across all watercourses. While the River Ouse presents the greatest relative risk due to traffic levels and tidal influences, this risk is effectively mitigated through planned closures and active vessel management.

7.3.2 Lower-risk watercourses, including the Stainforth & Keadby Canal and River Idle, require comparatively limited intervention, while the Market Weighton Canal and Chesterfield Canal require targeted controls due to temporary bridge installations.

7.3.3 Overall, with the adoption of the identified mitigation measures and adherence to stakeholder requirements, the residual navigation risk is considered to be broadly acceptable and compliant with ALARP principles. The Proposed Development can therefore proceed without significant adverse impact on navigation, provided that the recommended measures are implemented and maintained throughout the construction phase. No additional risk controls further to these are required.

Abbreviations

Abbreviation	Full Reference
ABP	Associated British Ports
ADEPT	Association of Directors of Environment, Economy, Planning and Transport
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
AOB	Any Other Business
BST	British Summer Time
CHA	Competent Harbour Authority
CRT	Canal & River Trust
DCO	Development Consent Order
EA	Environment Agency
EIA	Environmental Impact Assessment
FFO	Fixed or Floating Object
FSA	Formal Safety Assessment
HAZID	Hazard Identification Workshop
HW	High Water
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IDB	Internal Drainage Board
LOA	Length Over All
MAIB	Marine Accident Investigation Branch
MSMS	Marine Safety Management System
NRA	Navigation Risk Assessment
LNtM	Local Notices to Mariners
OHL	Overhead Line
PAWSA	Ports and Watercourses Safety Assessment
PEIR	Preliminary Environmental Information Report
PMSC	Port Marine Safety Code

Abbreviation	Full Reference
RLB	Red Line Boundary
RHIB	Rigid Hull Inflatable Boat
SHA	Statutory Harbour Authority
SIRA	Simplified IALA Risk Assessment
SUP	Stand Up Paddleboard
VHF	Very High Frequency
VTS	Vessel Traffic Service

Appendix A
Hazard Logs

nationalgrid

Appendix A
Hazard Logs

Table A.1 – River Ouse

Haz.Id #:	Baseline Haz. Rank	Hazard Title	Embedded / Existing Mitigation	Possible causes	Baseline										Baseline Risk Score	Baseline Risk Rating
					Realistic Most Likely Scores					Realistic Worst Credible Scores						
					People	Property	Environment	Business	Frequency	People	Property	Environment	Business	Frequency		
9	1	Personal Injury: Recreational Vessel (Powered)	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Excessive vessel speed, Human Error, Misjudged manoeuvre, Lack of awareness	3	1	1	3	3	5	2	1	4	2	7.8	Low Risk - Broadly Acceptable
6	2	Grounding: Recreational Vessel (Powered)	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Excessive vessel speed, Human Error, Misjudged manoeuvre, Lack of awareness	3	1	1	2	3	5	2	1	4	2	7.6	Low Risk - Broadly Acceptable
10	3	Personal Injury: Recreational Vessel (Unpowered)	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Human Error, Misjudged manoeuvre, Lack of awareness	3	1	1	3	3	4	2	1	4	2	7.1	Low Risk - Broadly Acceptable
11	3	Personal Injury: Narrowboat	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Human Error, Misjudged manoeuvre, Lack of awareness	3	1	1	3	3	4	2	1	4	2	7.1	Low Risk - Broadly Acceptable
8	5	Personal Injury: Safety Boat	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Excessive vessel speed, Human Error, Misjudged manoeuvre	3	1	1	3	3	5	2	1	4	1	5.8	Low Risk - Broadly Acceptable

Haz.Id #:	Baseline Haz. Rank	Hazard Title	Embedded / Existing Mitigation	Possible causes	Baseline										Baseline Risk Score	Baseline Risk Rating
					Realistic Most Likely Scores					Realistic Worst Credible Scores						
					People	Property	Environment	Business	Frequency	People	Property	Environment	Business	Frequency		
5	6	Grounding: Safety Boat	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Excessive vessel speed, Human Error, Misjudged manoeuvre	3	1	1	2	2	5	2	2	4	1	4.4	Low Risk - Broadly Acceptable
7	7	Grounding: Narrowboat	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Human Error, Misjudged manoeuvre, Lack of awareness	2	1	1	2	3	4	2	1	4	1	4.3	Low Risk - Broadly Acceptable
2	8	Contact (Allision): Recreational Vessel (Powered)	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Excessive vessel speed, Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	2	1	2	1	1.9	Negligible Risk - Broadly Acceptable
4	8	Contact (Allision): Narrowboat	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	2	1	2	1	1.9	Negligible Risk - Broadly Acceptable
1	10	Contact (Allision): Safety Boat	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Communications failure, Equipment or Mechanical Failure, Excessive vessel speed, Human Error, Misjudged manoeuvre	1	1	1	1	2	2	2	1	1	1	1.9	Negligible Risk - Broadly Acceptable
3	10	Contact (Allision): Recreational Vessel (Unpowered)	Watercourse Closure, Notice to Mariners, Liaison with Relevant Authority, Safety Boats, Stakeholder Engagement	Action of the tidal stream , Adverse Environmental Conditions, Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	1	1	2	1	1.9	Negligible Risk - Broadly Acceptable

Table A.2 – Stainforth & Keadby Canal

							Baseline										
							Realistic Most Likely Scores					Realistic Worst Credible Scores					
Haz.Id #:	Baseline Haz. Rank	Hazard Type	Vessel Type	Hazard Title	Embedded / Existing Mitigation	Possible causes	People	Property	Environment	Business	Frequency	People	Property	Environment	Business	Frequency	Baseline Risk Score	Baseline Risk Rating
10	1	Personal Injury	Recreational Vessel (Unpowered)	Personal Injury: Recreational Vessel (Unpowered)	Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	2	1	1	2	2	3	1	1	3	1	3.0	Negligible Risk - Broadly Acceptable
4	2	Contact (Allision)	Narrowboat	Contact (Allision): Narrowboat	Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	2	1	2	1	1.9	Negligible Risk - Broadly Acceptable
11	3	Personal Injury	Narrowboat	Personal Injury: Narrowboat	Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	1	1	2	1	1.9	Negligible Risk - Broadly Acceptable
3	4	Contact (Allision)	Recreational Vessel (Unpowered)	Contact (Allision): Recreational Vessel (Unpowered)	Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	1	1	1	1	1.8	Negligible Risk - Broadly Acceptable

Table A.3 – Chesterfield Canal

Haz.Id #:	Baseline Haz. Rank	Hazard Type	Vessel Type	Hazard Title	Baseline												
					Embedded / Existing Mitigation	Possible causes	Realistic Most Likely Scores					Realistic Worst Credible Scores					Baseline Risk Score	Baseline Risk Rating
							People	Property	Environment	Business	Frequency	People	Property	Environment	Business	Frequency		
10	1	Personal Injury	Recreational Vessel (Unpowered)	Personal Injury: Recreational Vessel (Unpowered)	Watercourse Closure, Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	2	1	1	2	3	3	1	1	3	2	5.1	Low Risk - Broadly Acceptable
3	2	Contact (Allision)	Recreational Vessel (Unpowered)	Contact (Allision): Recreational Vessel (Unpowered)	Watercourse Closure, Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	3	2	1	1	1	2	3.1	Negligible Risk - Broadly Acceptable
4	3	Contact (Allision)	Narrowboat	Contact (Allision): Narrowboat	Watercourse Closure, Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	3	2	2	1	2	1	2.4	Negligible Risk - Broadly Acceptable
11	4	Personal Injury	Narrowboat	Personal Injury: Narrowboat	Watercourse Closure, Liaison with Relevant Authority, Signage, Online Alerts, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	1	1	2	1	1.9	Negligible Risk - Broadly Acceptable

Table A.4 – Market Weighton Canal

Haz.Id #:	Baseline Haz. Rank	Hazard Type	Vessel Type	Hazard Title	Baseline												
					Embedded / Existing Mitigation	Possible causes	Realistic Most Likely Scores					Realistic Worst Credible Scores					Baseline Risk Score	Baseline Risk Rating
							People	Property	Environment	Business	Frequency	People	Property	Environment	Business	Frequency		
10	1	Personal Injury	Recreational Vessel (Unpowered)	Personal Injury: Recreational Vessel (Unpowered)	Signage, Spotters, Stakeholder Engagement,	Human Error, Misjudged manoeuvre, Lack of awareness	2	1	1	2	3	3	1	1	3	2	5.1	Low Risk - Broadly Acceptable
3	2	Contact (Allision)	Recreational Vessel (Unpowered)	Contact (Allision): Recreational Vessel (Unpowered)	Liaison with Relevant Authority, Signage, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	3	2	1	1	1	2	3.1	Negligible Risk - Broadly Acceptable

Table A.5 – River Idle

Haz.Id #:	Baseline Haz. Rank	Hazard Type	Vessel Type	Hazard Title	Embedded / Existing Mitigation	Possible causes	Baseline										
							Realistic Most Likely Scores					Realistic Worst Credible Scores					
							People	Property	Environment	Business	Frequency	People	Property	Environment	Business	Frequency	Baseline Risk Score	Baseline Risk Rating
10	1	Personal Injury	Recreational Vessel (Unpowered)	Personal Injury: Recreational Vessel (Unpowered)	Liaison with Relevant Authority, Signage, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	2	1	1	2	2	3	1	1	3	1	3.0	Negligible Risk - Broadly Acceptable
4	2	Contact (Allision)	Narrowboat	Contact (Allision): Narrowboat	Liaison with Relevant Authority, Signage, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	2	1	2	1	1.9	Negligible Risk - Broadly Acceptable
11	3	Personal Injury	Narrowboat	Personal Injury: Narrowboat	Liaison with Relevant Authority, Signage, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	1	1	2	1	1.9	Negligible Risk - Broadly Acceptable
3	4	Contact (Allision)	Recreational Vessel (Unpowered)	Contact (Allision): Recreational Vessel (Unpowered)	Liaison with Relevant Authority, Signage, Spotters, Stakeholder Engagement	Human Error, Misjudged manoeuvre, Lack of awareness	1	1	1	1	2	2	1	1	1	1	1.8	Negligible Risk - Broadly Acceptable

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