

16 COMMERCIAL NAVIGATION

16.1 Introduction

16.1.1 This section of the ES describes the existing situation in relation to commercial navigation and assesses the potential impacts of the construction, operation and decommissioning phases of the proposed scheme. Mitigation measures are detailed where required and a discussion of the residual impacts presented.

16.1.2 The Scoping Opinion received from PINS during January 2014 confirmed that, given the Tees estuary is heavily industrialised, potential impacts on recreational users of the estuary could be scoped out of the assessment. Potential impacts on recreational navigational within the estuary were not, therefore, considered in the EIA process.

16.2 Policy and consultation

Policy

National Policy Statement

16.2.1 The NPS for Ports (Department for Transport, 2012) is of direct relevance to the proposed scheme, but does not provide any guidance or policy with regard to assessment of impacts to commercial navigation.

Marine Policy Statement

16.2.2 As outlined within the UK MPS (HM Government, 2011), port development may result in an increase in shipping activity. When considering any potential increase in shipping activity, the MPS states (in Paragraph 3.4.10) that marine plan authorities and decision makers should ensure that the social and economic benefits and environmental impacts are taken into account and that impacts are considered in line with sustainable development principles.

16.2.3 As outlined in the MPS (Paragraph 3.4.6), environmental impacts arising from shipping activity can be through accidental pollution from ships in the course of navigation or lawful operations, pollution caused by unlawful operations or physical damage caused by collisions. Other pressures on the environment from shipping activity relate to noise and airborne emissions. These potential impacts have been assessed within this section of the ES, where they are relevant to the proposed scheme.

16.2.4 The MPS (authorised by Section 44 of the Marine and Coastal Access Act, 2009) states that marine plan authorities and decision makers should take into account and seek to minimise any negative impacts on shipping activity, freedom of navigation and navigational safety and ensure that their decisions are in compliance with international maritime law (Paragraph 3.4.7).

Consultation

16.2.5 **Table 16-1** provides a summary of the comments received from PINS through their Scoping Opinion (**Appendix 4.2**) and during consultation under Section 42 of the Planning Act 2008 with specific regard to commercial navigation.

Table 16-1 Summary of comments in the PINS Scoping Opinion and received during consultation under Section 42 of the Planning Act 2008 with regard to commercial navigation

| Consultation Comment | Response / Section of the ES in which the comment has been addressed |
|---|---|
| Scoping Opinion (January 2014) | |
| <i>Secretary of State</i> | |
| The Secretary of State noted that a Marine Navigation Risk Assessment will be undertaken to inform the EIA. The Secretary of State suggests that the methodology and proposed mitigation are agreed in consultation with PD Ports as the harbour authority, MMO and Trinity House. | The outputs of the Marine Navigation Risk Assessment were presented in the PER and formed part of the Section 42 consultation process. |
| <i>MMO</i> | |
| The Marine Navigation Risk Assessment should consider both the potential lower number of larger vessels and the potential higher number of smaller vessels. It would also be helpful to assess the most likely scenario. | A range of scenarios were modelled within the Marine Navigation Risk Assessment, as outlined within Section 16.3 herein. |
| The EIA must assess the commercial navigation in-combination and cumulatively with other projects, including NGCT, QEII and Tees Dock No.1 quay. | The Marine Navigation Risk Assessment has taken into account the proposed import of bulk material to Tees Dock, as well as increased vessels due to the proposed scheme. The CIA also addresses navigation risks from other approved development in the Tees estuary. |
| <i>PD Ports</i> | |
| The proposed channel dredge should cover the full width of the navigation channel. Dredged quantities should be updated based on the full channel width. | Dredged quantities proposed for the proposed scheme are presented in Section 3 . The dredging proposed within the channel covers the whole channel width. |
| Section 42 consultation | |
| <i>Maritime and Coastguard Agency (MCA)</i> | |
| The MCA recommend that the Port Maritime Safety Code is taken into account within the design. Liaison with the local Harbour Authority will be required to develop a robust Safety Management System (SMS) for the project under this code. A Harbour Authority has a duty to conserve the harbour so that it is in a fit condition for a vessel to use it. | Noted. See Section 16.5 . The applicant is in discussions with PD Ports regarding these matters. |
| There is a British Standards Institution publication on Road Lighting BS5489. Part 8 relates to a code of practice for lighting which may affect the safe use of aerodromes, railways, harbours and navigable inland waterways. | Noted. |

16.2.6 Royal HaskoningDHV also requested and received shipping traffic data for the Tees estuary from PD Ports and discussions with the Harbour Master have been undertaken with respect to safe useable channel depths and widths (see **Section 16.3**, **Table 16-2** for details).

16.3 Methodology

Study area

16.3.1 The study area for this section of the ES comprises the Tees estuary, extending from the mouth of the estuary at the North and South Gare breakwaters upstream to the Transporter Bridge.

Existing environment

16.3.2 This section of the ES has been informed by a Marine Navigation Risk Assessment (Royal HaskoningDHV, 2014; included as **Appendix 16.1**) which was produced to predict any likely delays to existing and future vessel movements along the Tees estuary as a result of the proposed scheme (both in Phase 1 and Phase 2). The results of this study were used to inform the impact assessment for this section of the ES. The methodology adopted for the risk assessment is presented in full within **Appendix 16.1** and summarised below.

Marine Navigation Risk Assessment

Model parameters

16.3.3 The Marine Navigation Risk Assessment utilised a version of Royal HaskoningDHV's Marine Traffic Model (MARTRAM) to simulate potential delays to shipping traffic within the estuary. MARTRAM focusses on both the potential for vessel interaction where one or more vessels are under navigation, and the delays that would be caused to scheduling in order to avoid such encounters.

Channel depths used within the model

16.3.4 Discussions with the Harbour Master were undertaken to agree the effective safe useable channel depths and widths to use within the model. The agreed effective channel depths used within the model were less than those published on the Admiralty Chart due to sedimentation within the approach channel reducing the safe navigable depth of the channel.

16.3.5 In order to model the current situation as closely as possible, the effective depths presented in **Table 16-2** were used rather than the stated Admiralty Chart depth. This approach resulted in the reduction of the available tidal window for vessel movements and represents a 'worst case' scenario for use within the model.

Table 16-2 Observed and effective channel depths within the Tees estuary

| Location | Current Dredged Depth (m bCD) | Margin (under keel allowance) (m) | Effective Depth (m bCD) |
|-----------------------------|-------------------------------|-----------------------------------|-------------------------|
| Channel Sea Reach | 14.7 | 2.3 | 12.4 |
| Seaton Channel Turning Area | 13.3 | 0.9 | 12.4 |
| Channel Lower Reach | 13.3 | 0.9 | 12.4 |
| Channel Upper Reach | 9.9 | 0.9 | 9.0 |
| Tees Dock Turning Area | 8.3 | 0.9 | 7.4 |

| Location | Current Dredged Depth (m bCD) | Margin (under keel allowance) (m) | Effective Depth (m bCD) |
|--|-------------------------------|-----------------------------------|-------------------------|
| North Tees Berths 3 and 4 and Teesport Oil Jetties | 9.9 | 0.9 | 9.0 |
| North Tees Berth 2 and South Bank Wharf | 8.0 | 0.9 | 7.1 |
| Teesport Commerce Park Upstream | Generally 5.2 reducing to 4.5 | 0.9 | 4.3 reducing to 3.6 |

Anticipated operational phase vessel movements

- 16.3.6 By combining the data from the historic vessel movements within the Tees estuary and the forecasts for future vessel movements as a result of the proposed scheme, a combined forecast was made regarding the anticipated vessel traffic within the Tees estuary for use within the model.
- 16.3.7 Based on an export volume of 6.5mtpa from the port terminal (Phase 1), a total of 96 vessels per year are anticipated to arrive at and depart from the terminal. A total of 191 vessels per year are anticipated to arrive at, and depart from, the terminal during Phase 2 of the scheme. These predicted vessel numbers were used within the MARTRAM model.

Model scenarios

- 16.3.8 Six scenarios (in addition to a base case) were modelled as part of the Marine Navigation Risk Assessment, comprising:
- Scenario 0 (existing vessel movements, validation and calibration model to create a base case).
 - Scenario 1 (existing vessel movements, export of 6.5mtpa of product from Bran Sands, using one berth, plus Tees Dock bulk import vessels).
 - Scenario 2 (existing vessel movements, export of 13mtpa of product from Bran Sands, using one berth, plus Tees Dock bulk import vessels).
 - Scenario 3 (existing vessel movements, export of 13mtpa of product from Bran Sands, using two berths, plus Tees Dock bulk import vessels).
 - Scenario 4 (existing vessel movements, export of 6.5mtpa of product from Bran Sands using one berth).
 - Scenario 5 (existing vessel movements, export of 13mtpa of product from Bran Sands using one berth).
 - Scenario 6 (existing vessel movements, export of 13mtpa of product from Bran Sands using two berths).
- 16.3.9 Each of the model scenarios was run at least ten times in order to generate several different variations on vessel arrivals. Each scenario was run for a simulation period of 14 days.
- 16.3.10 The scenarios of direct relevance to the proposed scheme (based on the scheme description presented in **Section 3**) are Scenarios 1, 3, 4 and 6. Scenarios 2 and 5 are not of direct relevance to the proposed scheme, given the current proposal to export product from a terminal with two berths following completion of Phase 2, rather than a terminal with one berth.

Methodology for assessment of potential impacts

- 16.3.11 The assessment methodology used to determine the potential environmental impacts on commercial navigation associated with the proposed scheme is generally as set out in **Section 4**.
- 16.3.12 Reference to **Section 5.5** and **Section 5.6** of this ES has also been made to determine the potential significance of any impacts to navigational safety as a result of changes to the hydrodynamic regime during construction and operation of the proposed scheme.

16.4 Existing environment

- 16.4.1 Many of the riverside industrial plants along the 17km stretch of the River Tees have docking and cargo facilities and, therefore, the River Tees experiences significant commercial vessel traffic. At present, there are up to approximately 1,000 shipping movements on the river every month (YPL, 2012). **Table 16-3** presents a summary of the number of vessel movements within the Tees estuary on a monthly basis during 2013 and 2014. This data was sourced from PD Ports; the January to September 2013 data was used to form the base case for the simulation model used within the Tees Marine Risk Assessment Study (as this was the data available at the time of producing the Marine Risk Assessment Study).

Table 16-3 Summary of monthly vessel movements within the Tees estuary from January to September 2013

| Month | Vessel movements (2013) | Vessel movements (2014) |
|-----------------|-------------------------|-------------------------|
| January | 824* | 922 |
| February | 808* | 907 |
| March | 981* | 1055 |
| April | 922* | 882 |
| May | 1009* | 804 |
| June | 871* | 767 |
| July | 899* | 869 |
| August | 867* | 857 |
| September | 869* | 878 |
| October | 890 | 893 |
| November | 886 | |
| December | 714 | |
| Monthly average | 878 | |

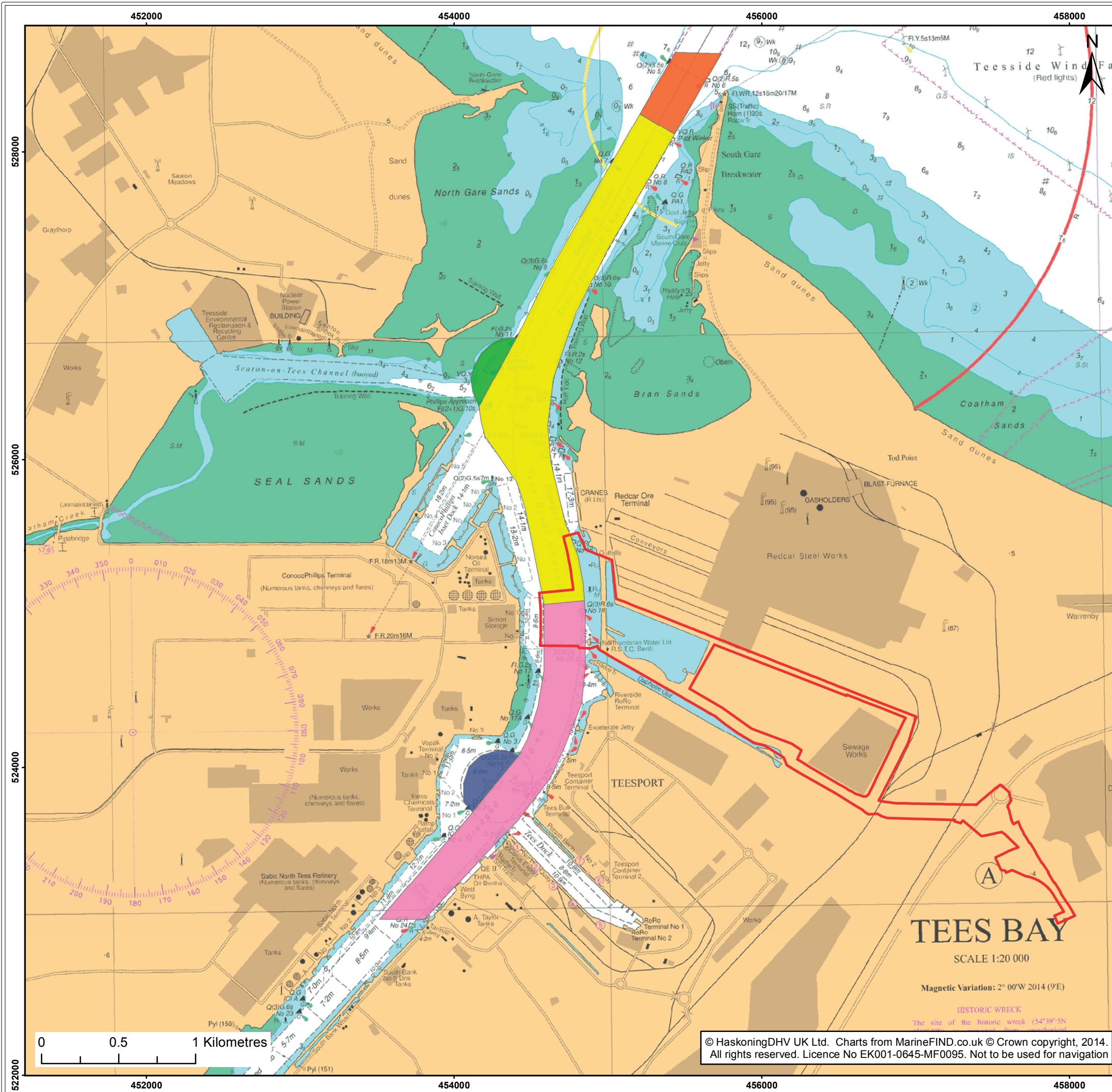
* Data used as part of the Marine Navigation Risk Assessment

- 16.4.2 **Table 16-3** indicates that the total monthly vessel numbers within the Tees estuary did not materially change during 2013, or in the first 10 months of 2014. Vessel movements peaked in May during 2013 and March during 2014.

- 16.4.3 The Tees estuary is approached from the north-east through a deep water channel in Tees Bay. The approach channel has an advertised depth of 15.4m below CD from Tees fairway light buoy to the entrance, where it reduces to 14.1m below CD. Thereafter the maintained depth is progressively reduced to 4.5m below CD, seven nautical miles from the entrance. The current advertised depths of the channel are shown in **Figure 16-1** (as discussed above, the Harbour Master has stated that the current channel depths do not match the advertised depths due to sedimentation within the channel).
- 16.4.4 There are currently two turning areas within the estuary; one within the Seaton Channel area which can accommodate vessels 350m in length and is regularly used for large tankers which berth at the Tees North Sea Oil Terminal and large bulk carriers bringing coal and ore to Redcar Ore Terminal. The second is the Tees Dock turning area which is used to turn vessels which berth at Tees Dock and at the bulk liquid jetties opposite.
- 16.4.5 Large deep drafted ships bound for Tees North Sea Oil Terminal and the Redcar Ore terminal pick up tug assistance after passing South Gare. Fully laden ships can only enter on the high tide but can leave at any time once their cargo has been discharged. Similarly, any fully laden ships to exit the river must wait for the high tide. Vessels are turned when unloaded either in the Seaton Channel turning area or in the Tees Dock Turning Area depending on which quay or jetty they are destined for.
- 16.4.6 The channel is maintained by PD Teesport which has a statutory responsibility to maintain the channel for safe navigation. Additionally, traffic in the Tees estuary is controlled by a sophisticated vessel traffic system (VTS).
- 16.4.7 Key receptors include all commercial shipping and any other activities of other operators present within the vicinity of the proposed construction works. It is considered that commercial shipping operators have a moderate capacity to accommodate change as a result of the proposed scheme (i.e. increased vessel activity within the Tees estuary), and would likely exhibit a degree of flexibility / adaptability to increased levels of shipping activity within the estuary; commercial shipping operators are therefore considered to be of medium sensitivity.
- 16.5 **Assessment of potential impacts during construction**

Potential interference with existing commercial navigation due to presence of construction vessels

- 16.5.1 During the construction phase there is the potential for conflict between the construction vessels (including dredging and piling vessels) and existing commercial vessels operating within the Tees estuary. There is also potential for conflict between vessels transporting construction materials (i.e. combi-piles for the solid quay structure only) to an existing quay within the estuary and existing vessels operating within the estuary. However, it is anticipated that less than five shipments would be required to transport combi-piles for the solid quay structure and, as such, a disturbance impact is not anticipated to arise given the very low number of anticipated vessel movements required for this purpose.



Legend:

- DCO Order Limits
- 15.4m
- 14.1m
- 10.4m
- 8.8m
- 11.7m

DCO Order Limits as of 24/02/15

| | |
|--------------------------------|--|
| Client: York Potash Limited | Project: York Potash Project Harbour Facilities |
|--------------------------------|--|

Title:
Environmental Statement: River Tees Navigational Channel - Dredged Depths near Harbour Facilities

| | | | | | |
|-------------|-----------------|---------------------------------|----------|-------|----------|
| Part: HF | Figure: 16.1 | Drawing No: 9Y0989-HF-16-001 | | | |
| Rev: | Date: | Drawn: | Checked: | Size: | Scale: |
| 1 | 04/03/2015 | JE | SR | A3 | 1:25,000 |
| 0 | 09/12/2014 | JE | SR | A3 | 1:25,000 |

Co-ordinate system: British National Grid



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- 16.5.2 Disturbance to existing vessel movements as a result of the proposed scheme would be likely to take the form of delays to vessel movements or increased collision risk within the estuary. Piling and dredge vessels would be predominantly focussed on the area in the immediate vicinity of the proposed port terminal during Phase 1 (outside of the approach channel), with only localised dredging required in the main channel during Phase 1. Such localised dredging within the approach channel would result in temporary disturbance to existing users for the duration of dredging (approximately 7 weeks).
- 16.5.3 On this basis, it is considered that there is limited potential for the construction phase vessels to impact upon existing navigational practices as the main dredge and construction vessels would be located outside of the main navigation channel. It is therefore predicted that there would be **no impact** on existing navigation during Phase 1 of the proposed scheme.
- 16.5.4 During Phase 2 of the proposed scheme, there would be a requirement for capital dredging within a section of the approach channel, as well as capital dredging to extend the berth pocket created during Phase 1. The dredging within the approach channel to be undertaken during Phase 2 of the proposed scheme, therefore, has the potential to cause disturbance to existing navigation, in the form of increased collision risk, obscuring navigational aids and the prevention / interference to activities being undertaken by other operators along the banks of the estuary. As for Phase 1 dredging of the approach channel, this potential conflict would be temporary, lasting only for the duration of the Phase 2 dredging works (approximately 6 weeks) for both of the quay construction options within a localised area of the approach channel.
- 16.5.5 PD Teesport would manage any potential conflicts in the same way as routine dredging and other construction activities, through co-ordination via the Harbour Master. Management of dredging operations within a busy port environment is a standard activity for the Harbour Master. It is considered that the use of a VTS would provide a satisfactory mechanism for the effective management of all shipping traffic within the Tees estuary and Tees Bay. The Harbour Master would issue Notices to Mariners to inform other users of the construction works and, in addition, construction vessels would use appropriate signals as required by International Regulations to allow safe navigation.
- 16.5.6 As recommended by the MCA, the Port Maritime Safety Code has/will be taken into account within the detailed design of the proposed scheme. Liaison with the Harbour Authority will be undertaken to develop a robust Safety Management System, which would be implemented and adhered to during the construction phase for the proposed scheme.
- 16.5.7 Based on the above, the magnitude of the impact is anticipated to be very low on a medium sensitivity receptor. The proposed scheme is, therefore, predicted to have an impact of **negligible** significance on commercial navigation during the construction phase.

Mitigation measures and residual impact

- 16.5.8 No mitigation measures are required and the residual impact is predicted to be of **negligible** significance.

16.6 Assessment of potential impacts during operation

Potential interference with existing commercial navigation due to increased vessel numbers

16.6.1 The results of the navigation risk assessment model scenarios of relevance to the proposed scheme are presented within **Table 16-4**. These results have been used to inform this impact assessment.

Table 16-4 Results of relevant model scenarios from the Marine Navigation Risk Assessment (Royal HaskoningDHV, 2014)

| Scenario | Total averaged waiting time per day (minutes) | Model vessel movements (14 day model period) | Failed vessel movements |
|--|---|--|-------------------------|
| 0 (existing vessel movements) | 3.1 | 372 | 0 |
| 1 (existing vessel movements, export of 6.5mtpa of product from Bran Sands, using one berth, plus Tees Dock bulk import vessels) | 19.1 | 388 | 1 |
| 3 (existing vessel movements, export of 13mtpa of product from Bran Sands, using two berths, plus Tees Dock bulk import vessels) | 22.1 | 395 | 1 |
| 4 (existing vessel movements, export of 6.5mtpa of product from Bran Sands using one berth). | 8.1 | 380 | 0 |
| 6 (existing vessel movements, export of 13mtpa of product from Bran Sands using two berths). | 11.9 | 387 | 0 |

16.6.2 The predicted delays to shipping vessel movements within the Tees estuary due to the various scenarios modelled as part of the Marine Navigation Risk Assessment, as presented within **Table 16-4**, indicates that the proposed scheme is unlikely to cause a significant delay to existing vessel movements during the operational phase. A maximum delay of 11.9 minutes per day was predicted for Scenario 6 with no failed vessel movements, which in comparison to the existing delay of 3.1 minutes is not considered to be significant.

16.6.3 The introduction of additional vessels into the Tees estuary in order to transport bulk material to Tees Dock alongside the predicted increase in vessel numbers as a result of the proposed scheme (modelled within Scenario 1 and 3), is predicted to cause a slight increase in average daily delays to vessels, as well as one failed vessel movement during both Scenario 1 and Scenario 3.

16.6.4 Analysis of the modelled data with regard to the failed scenarios revealed that such situations would have been effectively managed by the Harbour Master to prevent the failure from occurring (i.e. the Harbour Master would have co-ordinated the movements of vessels to ensure movements could be successfully completed within the tidal windows required, based on the vessel size).

16.6.5 All vessel traffic in the Tees estuary and Tees Bay is controlled by the VTS and this would, therefore, be applicable to all vessel traffic generated as a consequence of the proposed scheme.

- 16.6.6 The magnitude of this impact is considered to be very low, upon a medium sensitivity receptor. Based on the above, it is anticipated that the proposed scheme would have an impact of **negligible** significance on existing commercial navigation within the estuary during the operation phase.

Mitigation measures and residual impact

- 16.6.7 No mitigation measures are required and the residual impact is predicted to be of **negligible** significance.

Potential impacts to navigational safety due to changes to the hydrodynamic regime

- 16.6.8 The proposed scheme has the potential to indirectly impact upon navigation safety as a result of effects on the existing physical processes within the estuary. The predicted effects of the proposed scheme on existing physical processes are discussed in **Section 5.5** and **5.6**.

- 16.6.9 As discussed within **Section 5.6**, the results from the wave propagation modelling indicate a relatively localised effect of the port terminal options with regard to existing wave heights. Wave propagation modelling undertaken for the open quay structure has predicted no effect on wave heights for return period winds less than five years. The wave propagation modelling undertaken for the solid quay structure has predicted an increase in significant wave height in the range of 0.05m to 0.10m within the lower estuary.

- 16.6.10 Based on the hydrodynamic modelling results, the predicted effects of the proposed scheme due to changes to the hydrodynamic regime are relatively small and localised without any obvious implications for the overall morphological regime of the Tees estuary. The magnitude of the effect is, therefore, predicted to be very low. In this instance, the sensitivity of the receptor is considered to be high given the receptor risk (safety of humans on board vessels) and the long term nature of the impact. However, using the impact assessment matrix presented in **Section 4**, an impact of **negligible** significance is predicted.

Mitigation measures and residual impact

- 16.6.11 Potential measures to mitigate the potential effects of the proposed scheme on the morphology of the Tees estuary are limited to altering the design of the proposed scheme. However, based on the results of the hydrodynamic modelling work undertaken (see **Section 5**), it is considered that mitigation measures are not required with regard to this impact and a residual impact of **negligible** significance is predicted

16.7 Assessment of impacts during decommissioning

- 16.7.1 The proposed port terminal would be a long term infrastructure project. Currently there is no intention to decommission the terminal itself. Therefore, there would be no marine works required and **no impact** on navigation during the YPP decommissioning phase.

16.8 Summary

- 16.8.1 The Tees estuary experiences significant commercial vessel traffic, with up to approximately 900 shipping movements taking place on the river every month (using data from 2013 and the first 10

months of 2014). The approach channel is maintained by PD Teesport, which has a statutory responsibility to maintain the channel for safe navigation. Additionally, traffic in the Tees estuary is controlled by a sophisticated VTS.

- 16.8.2 The potential impacts of the proposed scheme on commercial navigation are considered to be well understood, and have been informed through the production of a Marine Navigation Risk Assessment (which utilised a large and complete data set of shipping traffic data sourced directly from the Harbour Master) and through site specific hydrodynamic modelling. It is therefore considered that there is a low degree of uncertainty associated with the assessment.
- 16.8.3 It is predicted that the proposed scheme would result in impacts of negligible significance on commercial navigation during both the construction and operation phases. No impacts are anticipated during the decommissioning phase given that there is no intention to decommission the terminal.
- 16.8.4 No mitigation measures are proposed for any of the impacts identified, given their negligible significance. However, a number of controls would be implemented to ensure safe navigation, including the issue of Notices to Mariners by the Harbour Master, ensuring that all construction vessels have appropriate signals as required by International Regulations, and utilisation of the existing VTS.
- 16.8.5 **Table 16-5** presents a summary of the potential impacts, mitigation measures and residual impact during the construction, operation and decommissioning phases of the proposed scheme with regard to commercial navigation.

Table 16-5 Summary of potential impacts, mitigation measures and residual impacts during the construction, operation and decommissioning phases of the proposed scheme with regard to commercial navigation

| Impact | Sensitivity of receptor to impact | Magnitude of effect | Significance of impact | Mitigation | Residual impact |
|--|-----------------------------------|---------------------|------------------------|---------------|-----------------|
| Construction | | | | | |
| Interference with existing commercial navigation due to presence of construction vessels | Medium | Very low | Negligible | None required | Negligible |
| Operation | | | | | |
| Interference with existing commercial navigation due to presence of construction vessels | Medium | Very low | Negligible | None required | Negligible |
| Potential impacts to navigational safety due to changes to the hydrodynamic regime | High | Very low | Negligible | None required | Negligible |
| Decommissioning | | | | | |
| No impacts anticipated. | | | | | |

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