REPORT

Tees Maintenance Dredge Protocol (MDP) Baseline Document

Renewal Application for Maintenance Dredging
L/2015/00427/7

Client:	PD Teesport Limited
Reference:	PC6304-RHD-XX-XX-RP-X-0001
Status:	Final/1
Date:	20 May 2025

Royal HaskoningDHV
Enhancing Society Together

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1 Introduction

1.1 Maintenance dredging and disposal

PD Teesport Limited has a statutory duty to maintain navigation within the Tees estuary and into the Hartlepool docks. As part of this responsibility, the port maintains the advertised dredge depths within the defined areas (hereafter referred to as "the maintained areas") as shown in **Figure 1-1**. To achieve this, maintenance dredging is undertaken, most of which is disposed of to sea at the Tees Bay A disposal site.

A marine licence related to the maintenance dredging L/2015/00427/7 was issued by the Marine Management Organisation (MMO) in 2015 and permits disposal of maintenance dredged material of up to a maximum of 2,889,700 tonnes wet weight per year. The marine licence, however, only permits disposal to sea because PD Teesport Limited, as a statutory harbour authority, meets the exemption within Section 75 of the Marine and Coastal Access Act 2009 relating to dredging activities. There have been a number of variations since the original licence was issued in 2015, these are summarised in **Table 1.1**.

Table 1.1 Marine licence history associated with current maintenance dredging and disposal activities[1]

Date	Stage	Comments and/or notable conditions	Licence reference
December 2015	Initial licence granted	Mid licence sampling in three yearly intervals, a maximum disposal allowance of 2,889,700 tonnes wet weight to Tees Bay A disposal site per annum, and exclusion of material for certain dredge areas for disposal to sea. Expiry 31 December 2025.	L/2015/00427/1
March 2019	Variation 1	Internal administrative variations which did not impact on licence contents.	L/2015/00427/2
September 2019	Variation 2	Internal administrative variations which did not impact on licence contents.	L/2015/00427/3
September 2019	Variation 3	Removed an area around Billingham Reach for disposal to sea due to high contaminant results following mid licence sampling. Further restricted an area until further sampling had been carried out and reviewed (to ensure sufficient spatial coverage). Submission of sampling information prior to variation issue removed the requirement for more sampling restriction.	L/2015/00427/4
October 2019	Variation 4	Removal of restriction at Billingham Reach resulting from sampling confirming sediment suitable for disposal to sea.	L/2015/00427/5
April 2021	Variation 5	Locally deepen the channel from a depth of an advertised 5.1m below Chart Datum (bCD) to a maximum depth of 5.7m bCD however would not exceed licenced disposal quantity. Additional sampling confirmed suitability for disposal to sea.	L/2015/00427/6
June 2022	Variation 6	Admin error in licenced volume. Additional sampling requirement added to licence should disposal volumes go beyond 1 million tonnes wet weight.	L/2015/00427/7

The operations carried out under this licence are periodically inspected by the MMO. The most recent inspection was carried out in 2024 and concluded that the activities were compliant with licence L/2015/00427/7 (see **Appendix A**). L/2015/00427/7 has an end date of 31 December 2025 therefore PD

[1] *Tees and Hartlepool Maintenance Dredge Disposal Licence - GOV.UK*

Teesport Limited is in the process of seeking a marine licence for the next ten years, i.e. until 31 December 2035.

1.2 Maintenance Dredge Protocol (MDP) Baseline Document

Maintenance Dredging and the Habitats Regulations 1994, *A Conservation Assessment Protocol for England* (referred to as 'the Protocol' hereafter) was published by the Department for Environment, Food and Rural Affairs (Defra) in 2007. The Protocol set out an approach for operators and regulators to provide a 'Maintenance Dredge Protocol (MDP) Baseline Document' to present existing and readily available information to describe the current and historical patterns of dredging in relation to the conservation objectives of a site part of the National Site Network[2] (see **Figure 1-2**).

The Protocol aids operators and regulators seeking or giving approval for maintenance dredging activities that could potentially affect sites part of the National Site Network. Following this process enables issues associated with The Conservation of Habitats and Species Regulations 2017 (as amended) to be dealt with in a streamlined and proportionate manner, assisting harbour and port authorities in fulfilling their statutory obligations, and minimising the delay and cost to port and marine operators in obtaining consents.

The presumption in assessing any potential consequences of maintenance dredging activity is that dredging will continue in line with the established practice (described herein). The baseline document also presumes that existing practice is part of the functioning of the existing system given the timeframe over which it has occurred and continues to occur.

1.3 Updates to the MDP Baseline Document

The original document was produced in 2005 (ABPmer, 2005). Royal HaskoningDHV subsequently produced an updated version in February 2008 (Royal HaskoningDHV, 2008) which incorporated information relevant to the integrity of the site part of the National Site Network. The reviews undertaken since the start of the 2015 marine licence and conclusions are summarised in **Table 1.2**.

Table 1.2 Summary of baseline documents produced since the granting of the current marine licence

Year	Content	Summary findings	Reference
2022	Dredge and disposal volumes updated alongside details of Harbour Revision Order (HRO) application to extend boundary at South Bank Quay.	No material changes to the dredging and disposal practices and therefore no amendments to the conclusions within the 2019 update – that maintenance dredging does not appear to be having, or has historically had, an impact on designated sites.	Royal HaskoningDHV, 2023
2020	Dredge and disposal volumes updated. Included details of mid licence sampling for maintenance dredging (in addition to data from several capital projects).	There have been no material changes to the dredging and disposal practices within the Tees estuary since the 2019 update. There are a number of major planned and consented projects within the Tees estuary, but the proposed schemes are not predicted to require an amendment to the maintenance dredging strategy. It was concluded that there is no reason to amend the conclusions within the 2019 update - that maintenance dredging does not	Royal HaskoningDHV, 2022

[2] *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 makes changes to the Conservation of Species and Habitats Regulations 2017, following the UK's exit from the European Union. Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in the UK no longer form part of the EU's Natura 2000 ecological network. The 2019 Regulations have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK.*

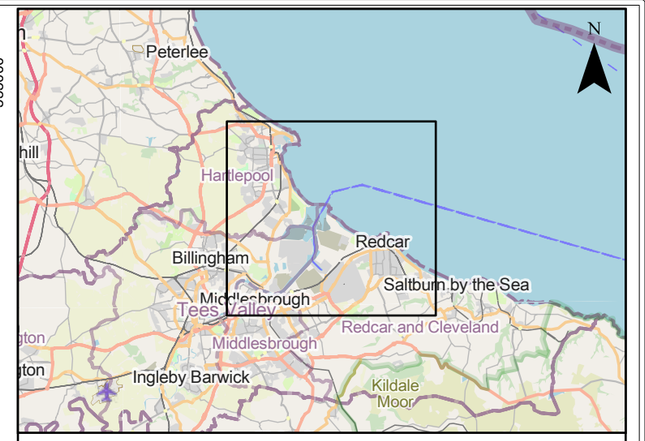
Year	Content	Summary findings	Reference
		appear to be having, or has historically had, an impact on designated sites.	
2019	Dredge and disposal volumes updated. The proposed changes to the designated sites were classified on 16th January 2020. As the changes to the boundaries and interest features of these sites were fully documented within the 2018 update, they weren't considered further in the 2019 update.	There have been no changes to the designated sites since the 2018 update, other than to formalise the proposed changes which have been previously documented and assessed in the 2018 update. No further environmental survey information is available since production of the 2018 update and there have been no material changes to dredging and disposal practices.	Royal HaskoningDHV, 2020
2018	Dredge and disposal volumes updated. Features of proposed extension detailed for the Special Protection Area (SPA) and changes to Sites of Special Scientific Interest (SSSIs). New sediment sample data collected in 2018 and 2019 included. Concentrations of metals in the vast majority of samples were elevated above Action Level 1 but were marginal only. There were no exceedances of Action Level 2. Concentrations of polyaromatic hydrocarbons (PAHs) were elevated but against historical samples concentrations are not unexpected.	Due to changes to the Teesmouth and Cleveland Coast SSSI, SPA and Ramsar site, further impact assessment was undertaken to assess the potential effects on the existing and proposed designated sites using the most recent maintenance dredging information and sediment quality data. Concluded that the existing maintenance dredging activity being undertaken in the study area does not appear to be having, or has historically had, an impact on the existing designated sites. If existing practices are continued, maintenance dredging activities will not affect the current and proposed designated sites, as the maintenance dredging forms a long-established part of the overall existing estuary regime.	Royal HaskoningDHV, 2019
2017	Dredge and disposal volumes updated. No change in dredging practices. Describes SPA extension and Ramsar site to include additional wetland areas. Describes SSSI review. Notified a new SSSI on 31st July 2018, known as the Teesmouth and Cleveland Coast SSSI, which includes the majority of the area of the previously notified SSSIs. Parts of Seal Sands SSSI are no longer considered to be of special interest by Natural England and have therefore been proposed for denotification. Described formation of the Tees Estuary Partnership (TEP) (in 2016). Development of Memorandum of Understanding (MoU) and outcomes for nature conservation.	As maintenance dredging practices have remained unchanged during the reporting period (2017) there is no potential for additional impacts on the existing interest features of the SPA (or Ramsar site) to have arisen. In addition, there is no new environmental information for the current reporting period that could affect the previous impact assessment and, therefore, there are no implications for the interest features of the designated sites. Given proposed extension not agreed, not considered in this update.	Royal HaskoningDHV, 2018
2016	Dredge and disposal volumes updated. Added output from technical notes – coastal processes to provide a background description of the physical processes and morphological features in Tees Bay and along the Redcar frontage and updated beach survey analysis to the most recent survey of spring 2013. Update concludes that overall, such large net volumes of accretion having occurred when maintenance dredging was ongoing suggests that dredging is not having an adverse impact on beach levels at Redcar. Furthermore, the natural variability in beach levels and volumes can be marked at particular	As maintenance dredging practices were unchanged during the reporting period (2016) it was concluded that there was no potential for additional impacts on the interest features of the SPA (or Ramsar site). In addition, there was no new environmental information for the reporting period that could affect the previous impact assessment and, therefore, it was concluded that there are no implications for the interest features of the designated sites.	Royal HaskoningDHV, 2017

Year	Content	Summary findings	Reference
	frontages, including Redcar, as part of natural seasonal patterns or storm-related responses. Describes consultation to extend the SPA boundary. Sirius Minerals Harbour facilities scheme consented but Environmental Statement concluded no deposition resulting from the scheme therefore no changes to the current maintenance dredging practices.		

1.4 Purpose of this document

PD Teesport Limited has commissioned Royal HaskoningDHV to update the MDP Baseline Document to demonstrate that maintenance dredging remains compliant with The Conservation of Habitats and Species Regulations 2017 (as amended).

Whilst the history of the baseline document is detailed above, this document aims to revisit the full baseline and provide the necessary data to allow the ongoing maintenance dredging to be re-assessed in accordance with the Habitats Regulations (a Habitats Regulations Assessment (HRA)) and the Conservation Assessment Protocol on Maintenance Dredging as part of the marine licence application to continue maintenance dredging for the next 10 years.



Legend

- Maintained areas
- Tees Bay A disposal site

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Maintained areas and Tees Bay A disposal site

Figure: 1.1

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	20/05/2025	TC	CP	A3	1:60,000

Co-ordinate system: British National Grid

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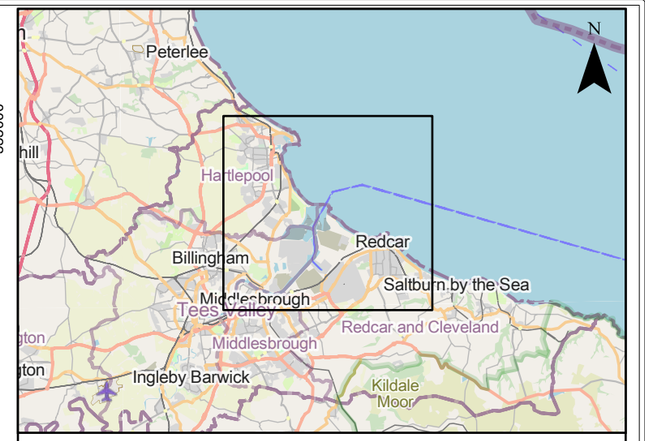

Legend

- Maintained areas
- Teesmouth and Cleveland Coast Special Protection Area (SPA)
- Teesmouth and Cleveland Coast Ramsar Site

Client:	Project:
PD Teesport Limited	Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: National Site Network Sites

Figure: 1.2

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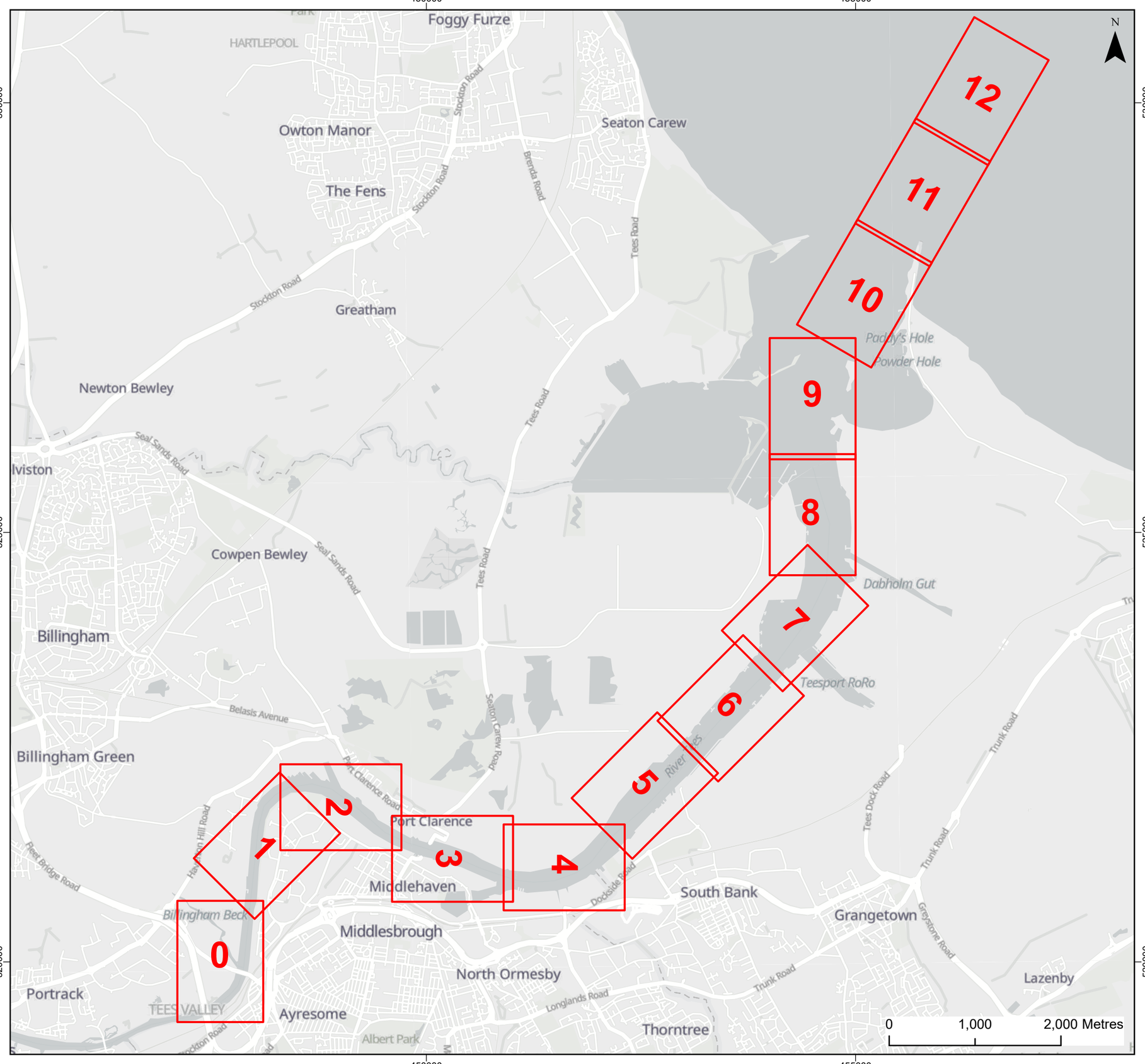
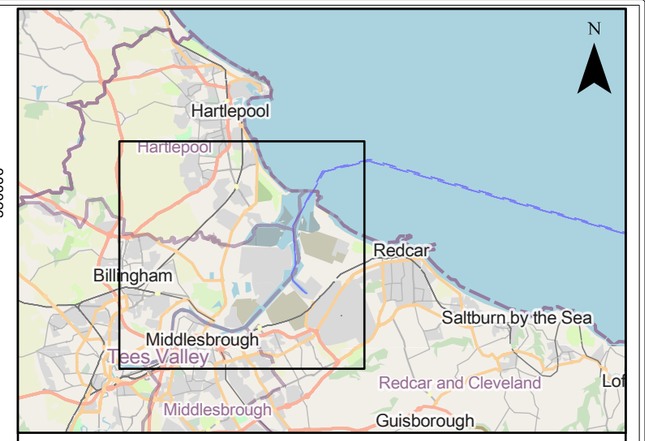
2 Maintenance Dredging Regime

2.1 Maintained areas

The maintained area is defined as the area commencing 185m down-estuary of the Tees Barrage at Blue House Point to the seaward limit of the Port Authority Area as shown in **Figure 1-1**. This area includes all river frontage and facilities within the estuary commencing near the Tees Barrage. The port facilities within Hartlepool Bay are also included. The maintained area within the Tees estuary is subdivided into 13 reaches (0 to 12) as shown in **Figure 2-1**.





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Dredge Reaches

Client:	Project:
PD Teesport Limited	Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Dredge reaches – 0 to 12

Figure: 2.1

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The maintained area has remained similar to that detailed in the original 2005 baseline document, however, in 2022 an application was made to the MMO under Section 14 of the Harbours Act 1964 for a Harbour Revision Order (HRO) to vary the boundary of its jurisdiction as a result of the South Bank Quay development (see **Figure 2-2**) (case reference Case Reference: HRO/2022/00001). This is required to accommodate pilotage purposes and to enable maintenance dredging in this area. The HRO was granted in September 2024[3]. The maintenance area boundaries detailed in this document and in the marine licence application for the next 10 years include this area.

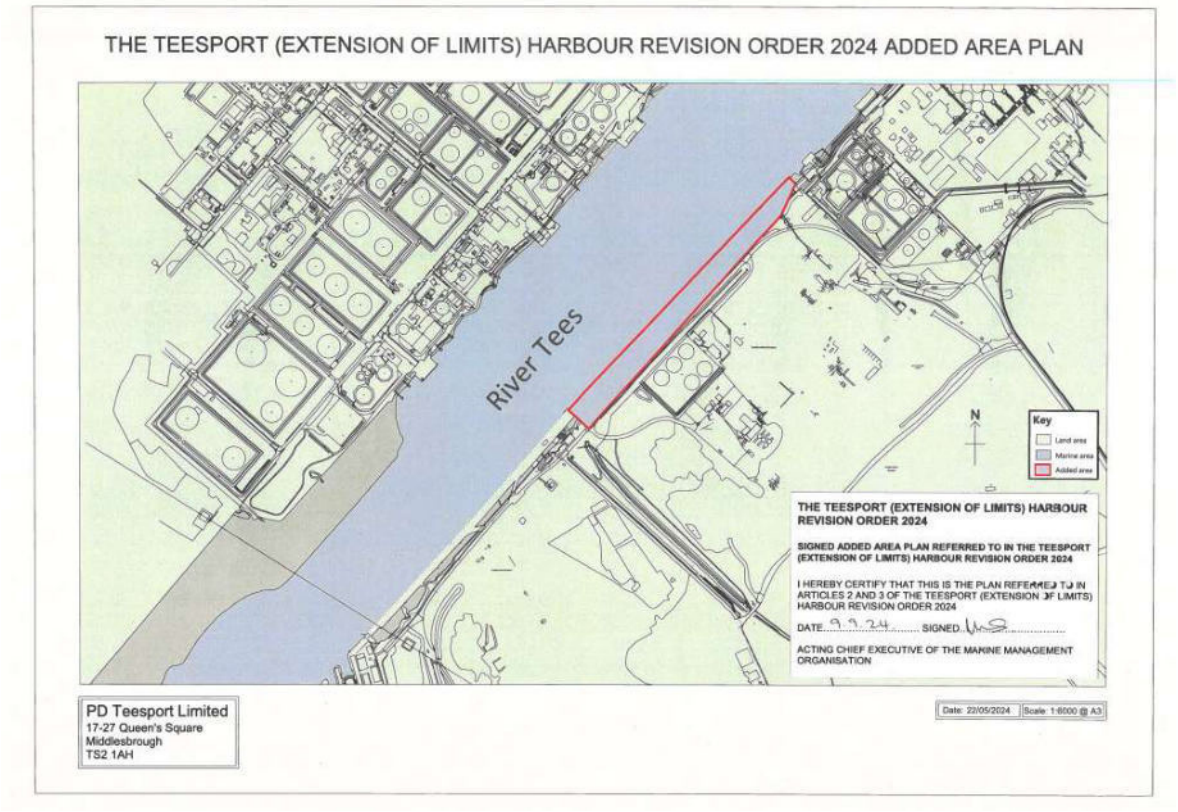


Figure 2-2 The Teesport HRO extension of limits

2.2 Dredge depths

The main channel in the Tees has a declared depth of 15.4m bCD in the approach channel (i.e. in Tees Bay), 14.1m bCD to upstream of Redcar Ore Terminal, 10.4m bCD up to Teesport and then progressively less depth up to 4.5m bCD in Billingham Reach. At Hartlepool, the main tidal basin has a dredged depth of 6.8m bCD.

Changes to the channel over the last 10 years have included a variation in 2020 to deepen the channel from an advertised depth of 5.1m bCD to 5.7m bCD in the upper reaches (see **Table 1.1** variation 5) and a realignment of the Hartlepool channel via marine licence reference L/2019/00328/1 (see **Table 1.1**).

2.3 Dredging methods

Most maintenance dredging occurs in the approach channel and low-middle estuary to maintain access to berth pockets and impounded docks. Generally, reaches 1 to 5 have dredge materials of an organic silty nature. Reaches 6 to 8 are generally sandy silt and silty sand, and reaches 9 and seaward (i.e. 10, 11 and

[3] *Teesport (Extension of Limits) Harbour Revision Order - GOV.UK*

12) are predominantly composed of sand with fine sand moving to a coarser nature towards the sea. Two methods for dredging are currently undertaken. These are suction dredging and plough dredging.

2.3.1 Suction dredging

PD Teesport Limited employs two trailing suction hopper dredgers (TSHD) of 2,000m^3 and 1,500m^3 hopper volume to maintain depths within the navigable channel and berths within the Tees and Hartlepool.

The smaller hopper suction dredger, "Heortnesse" predominantly dredges sand or sandy silts. The “Heortnesse” was subject to a £2.5 million refurbishment to extend its lifespan, improve dredge management and reduce emissions in 2022.

The larger hopper suction dredger, "Emerald Duchess", concentrates on silts, fine and medium sands and berth/frontage dredging and is fitted with a power management system which swaps between power from a battery pack and fuel made from hydrotreated vegetable oil, also known as renewable diesel. Additionally, the dredger does not require ballast water therefore there are no risks associated with ballast water management. The “Emerald Duchess” is shown in **Plate 2-1**.

Plate 2-1 Emerald Duchess

Both are traditional suction dredgers with active bottom door dumping systems, the only variation being the vessel hopper capacity. The suction dredgers operate on a nominal production time 12.5 hours per day for six days per week. This can, for a limited period, be increased to 24 hours and seven days per week where sudden increases in deposition rate occur, primarily following storm conditions. Based on both vessels working together, the maximum disposal rate equates to around 1200 metric tonnes per hour and nominally centred around daylight hours.

Occasionally, additional vessels are commissioned to assist in the maintenance of the channels. For example, in 2021, hydrographic surveys identified an accumulation of sediment in reaches 10 to 12, particularly in 11, arising from storm activity including the February 2018 ‘Beast from the East’. To manage this infill, the dredger ‘Orca’ (hopper capacity of 2,373m^3) was employed to remove the backlog and restore bed levels to at least 14.6m bCD during the period 25th September 2021 to 4th October 2021. In total the Orca dredged approximately 150,000 tonnes of sediment across reaches 10, 11 and 12, the majority in reach 11.

2.3.2 Plough dredging

A multi-purpose vessel “Tees Guardian” utilising a 10m plough (bed-leveller) removes isolated high spots on the river bed primarily off frontages or confined areas. The material is removed from the high spots and deposited into deeper areas where they can be removed using conventional suction dredge processes. Use

of this method results in no change and on occasion a reduction in production volume or disposal volume, but allows dredge depths to be better maintained.

2.4 Dredge volumes

Dredged volumes (m^3) from each reach since 2001 are summarised in **Figure 2-3** and are presented in **Appendix B**.

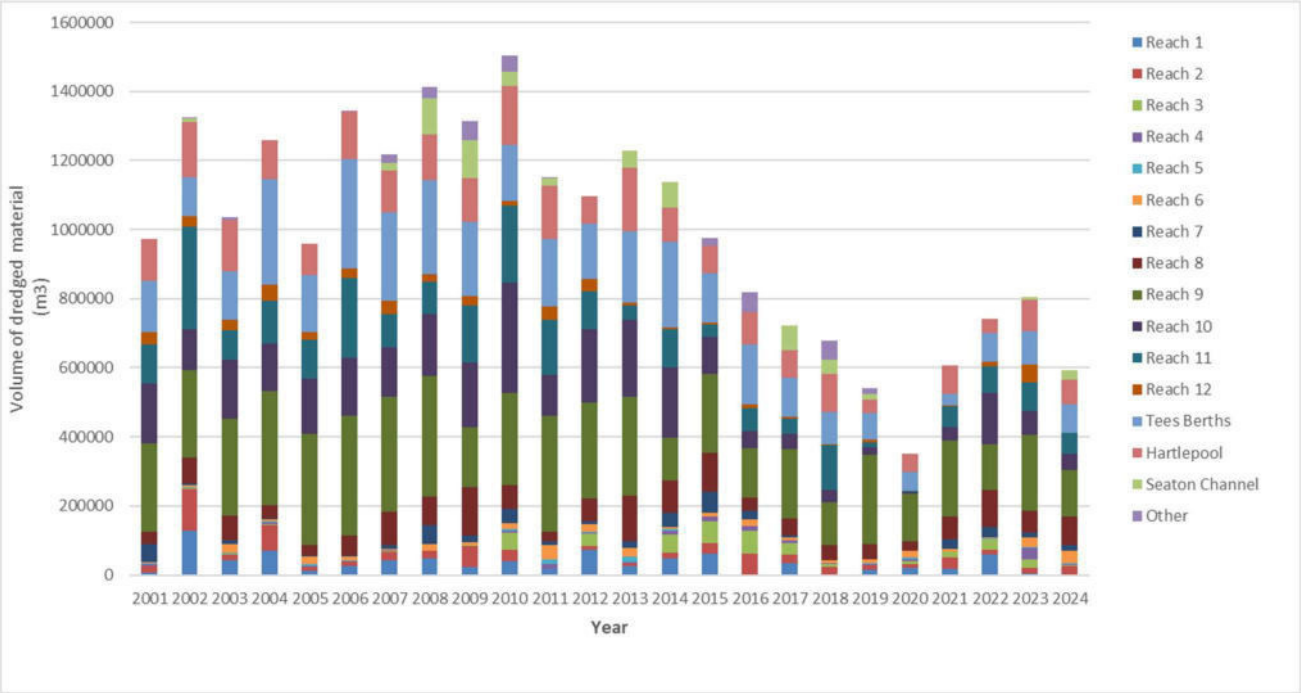


Figure 2-3 Summary of volumes (m^3) dredged between 2001 and end of 2024

3 Disposal Strategy

The volume of dredged material requiring disposal from maintenance dredging operations must be recorded and provided to the MMO as a condition of the marine licence (L/2015/00427/7).

3.1 Disposal locations and quantities

In general, Tees Bay A (TY160) is used for the disposal of maintenance dredge arisings while Tees Bay C (TY150) is used for capital dredge arisings (see **Figure 3-1**). L/2015/00427/7 only allows for disposal of maintenance material at Tees Bay A – details presented in **Table 3.1**. The sediments within the vicinity of the Tees Bay A (TY160) disposal site are slightly gravelly muddy sand and slightly gravelly sand (Cefas, 2024).

Table 3.1 Details for Tees Bay A

Disposal site	Status	Description	Comment
Tees Bay A (TY160) Within the area bounded by joining the points: 54 40.800 N 01 03.500 W 54 41.500 N 01 02.200 W 54 41.000 N 01 00.300 W 54 40.200 N 01 01.500 W 54 40.800 N 01 03.500 W	Active	Active site for soft non-cohesive maintenance material	OSPAR returns reported the disposal of 822,290 in 2024 compared to 710,347 wet tonnes in 2021, 944,707 wet tonnes in 2022 and 1,080,202 wet tonnes in 2023.

3.2 Sediment quality data

The marine licence requires interim sediment sampling and laboratory analysis to confirm that the material remains suitable for offshore disposal. Currently excluded sites are:

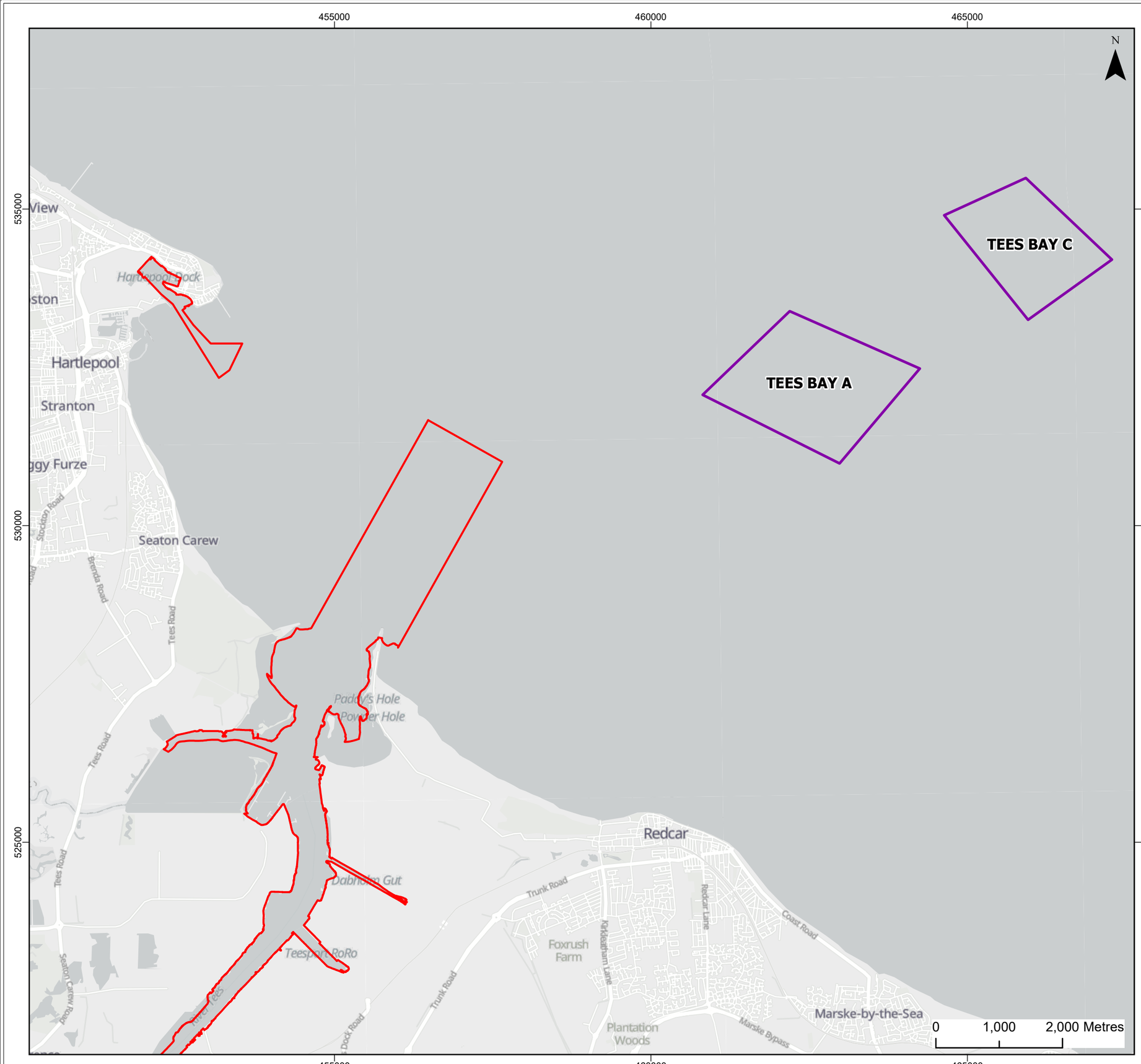
- Cochrane's/Tees Wharf;
- Normanby Wharf Graving Dock;
- Tees Offshore Base;
- Teesport Commerce Wharf Dry Dock;
- Wharf Britannia; and
- Enterprise Zone.

Historically, the numbers of samples for each mid licence interval and for the original 2015 application have varied, for example in 2019, mid licence sampling was combined with sampling programmes being carried out to inform capital dredge projects. Mid licence sediment sampling occurring since issue of the 2015 marine licence is summarised in **Table 3.2** and sample locations are shown in **Figure 3-2.** Note particle size analysis (PSA) is required for all samples.

Table 3.2 Summary of mid licence sediment sampling since issue of marine licence in 2015

Year of samples	Reason	Samples collected	MMO references	Contaminants (PSA is required for all samples)	Outcome
2024	Mid licence sampling condition Year 9	31 samples	SAM/2024/00054 Data files MAR02481 MAR02499	Trace metals, organotins, polyaromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCPs), polybrominated diphenyl ethers (PBDE), Total Organic Carbon (TOC)	Condition 5.2.3 discharged
2023[4]	Additional mid licence sampling	10 samples	SAM/2023/00028 Data file MAR02085	Trace metals, organotins, PAHs, PCBs, OCPs, PBDEs	Condition 5.2.9 discharged
2021	Mid licence sampling condition Year 6	20 samples	SAM/2021/00027 Data file MAR01178	Trace metals, organotins, PAHs, PCBs and OCPs	Condition 5.2.3 discharged
2018 /2019	Mid licence sampling condition Year 3	37 samples collected as part of sediment sampling to inform the Northern Gateway Container Terminal (NGCT) project and 10 additional surface samples to cover areas outside of the NGCT project. Additional samples (a further 10) were collected in Hartlepool as part of a capital dredge which were accepted as suitable for this area to meet the requirements of mid licence sampling.	SAM/2018/00069 Data file MAR00356 for the 37 NGCT samples Data file MAR01178 V3 for the 10 additional samples. SAM/2018/00050 For the 10 Hartlepool samples. Data file Carcinus 20126278 – MMO Results	Trace metals, organotins, PAHs, PCBs, OCPs, PBDEs	Condition 5.2.3 discharged

[4] Error in sampling plan provided by MMO only allowed disposal of material up to 1 million wet tonnes therefore condition added to licence to require that any disposal above must be supported by additional samples.



Legend

- Maintained areas
- Active disposal site

Distance from disposal site TEES BAY A to redline boundary
- Tees: 3.3 km
- Hartlepool: 7.3 km

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Location of active disposal grounds

Figure: 3.1

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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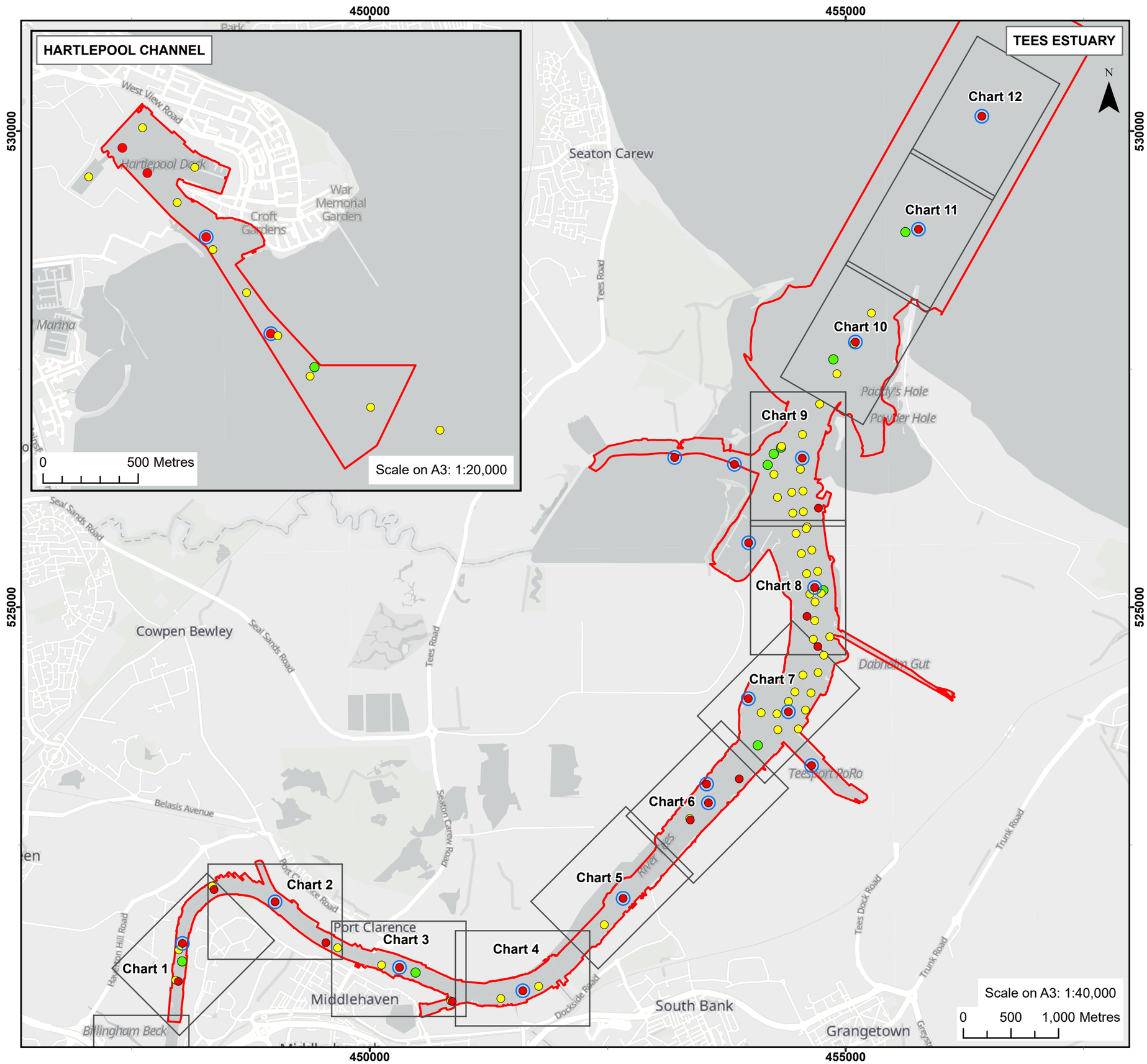

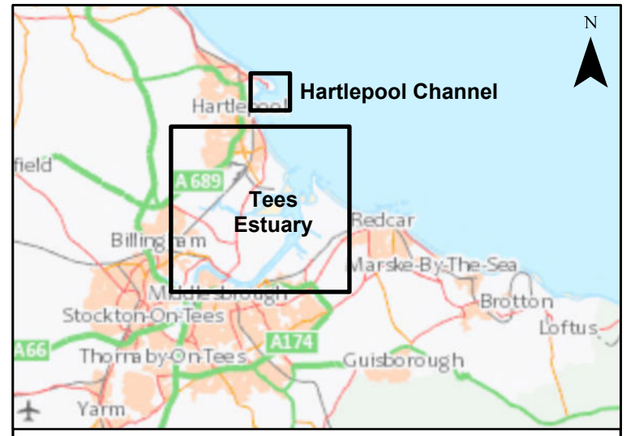

Legend

- Maintained areas
- Year 3 [2019] sample location (57)
- Year 6 [2021] sample location (20)
- 2023 Additional sample location
- Year 9 [2024] sample location (31)
- Dredge Reaches 1 to 12 as referred to in the Tees Maintenance Dredging Baseline Document

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Mid licence sampling undertaken since 2015

Figure: 3.2

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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3.2.1 Mid licence year 3 results

A sediment quality survey was undertaken in July and August 2019 for the Northern Gateway Container Terminal (NGCT) project in accordance with the requirements set out in the MMO's sample plan SAM/2018/00069. The survey comprised the recovery of 37 surface samples within and adjacent to the proposed dredge envelope. The MMO confirmed that sampling at depth was not required due to ground conditions evidenced through borehole logs submitted in support of the sampling plan request to the MMO. A summary of the data is provided in **Appendix C**.

Concentrations of metals in the vast majority of samples were elevated above Cefas Action Level 1 (30 of the 36 samples contained at least one metal above Action Level 1). The exceedances above Cefas Action Level 1 were marginal only. There were no exceedances of Cefas Action Level 2. Concentrations of organotins in all samples were below Cefas Action Level 1. In the vast majority of cases, concentrations were less than the laboratory detection limits.

The concentrations ranged from marginal exceedances above Cefas Action Level 1 with regard to the majority of PAH compounds, however, concentrations of napthalenes were present in one location adjacent to Teesport up to seven times greater than Cefas Action Level 1 (however were generally two or three times the Cefas Action Level 1 value). Concentrations of C1 Naphthalene, C2 Naphthalene and C3 Naphthalene were present above Cefas Action Level 1 in all 36 samples, whilst C1 Phenanthrene, Naphthalene and Phenanthrene were elevated in 33 samples. Concentrations of total hydrocarbons (THC) were also relatively high, peaking at 975mg/kg.

One sample analysed contained PCBs (sum of for International Council for the Exploration of the Sea (ICES) 7 and sum of 25 congeners) in concentrations marginally greater than Cefas Action Level 1 and no exceedances of Action Level 2 were recorded. The concentration of organochlorines present was generally less than the laboratory detection limit of 0.0001mg/kg.

The concentrations of PDBEs ranged from <0.02µg/kg to 4.93µg/kg (excluding BDE209). The concentrations of BDE209 ranged from 3.81µg/kg to 407µg/kg. Cefas advised (within SAM/2018/00069) that the distribution and concentrations of PBDE congeners in the marine environment are highly variable, and whilst named as a Chemical for Priority Action, at the time of the assessment there were no formal assessment values developed with which to assess status. Within SAM/2018/00069, Cefas stated that BDE congener 209 is generally expected to be found in much higher concentrations in the marine environment (compared with the results of the other BDE congeners); the data presented above confirms this expectation.

In addition to the samples collected for NGCT, 10 surface sediment samples were collected upstream in December 2018 to ensure the maintenance dredge footprint was adequately sampled. A summary of the results is provided in **Appendix C**. The results showed there was one exceedance of Cefas Action Level 2 which was PCB (sum of 25 congeners). Minor exceedances of Cefas Action Level 1 were present at all locations for metals and PAHs. All organotins were recorded were below Cefas Action Level 1. The concentration of organochlorines present was generally above the laboratory detection limit of 0.0001mg/kg. Dieldrin was Action Level 1 at one location, whilst dichloro-diphenyl-trichloroethane (DDT) was marginally elevated in all locations. The concentrations of PDBEs ranged from 0.08µg/kg to 2.64µg/kg (excluding BDE209). The concentrations of BDE209 ranged from 247µg/kg to 912µg/kg.

The results show that sediment collected from Billingham Reach were above Cefas Action Level 2 for PCB (sum of 25 congeners). As a result, the MMO placed an exclusion on disposal to sea of material from the Billingham Reach Area. Four further samples were subsequently collected from the Billingham Reach Area

and no exceedances of Action Level 2 were recorded. Following the submission of the sediment data the marine licence was varied and the exclusion at Billingham Reach removed.

Regarding the 10 samples collected at Hartlepool, a summary of results is presented in **Appendix C**. There were elevations of Cefas Action Level 1 at all locations for at least one metal; however, no exceedances of Cefas Action Level 2 were recorded. All other metals and organotins present in samples 8 to 10 were below Cefas Action Level 1.

PAHs were found to be present in sediments above Cefas Action Level 1 at a number of locations. Exceedances ranged from marginal, to up to 10 times the value (in the case of C1-napthalenes and C2-napthalenes). There are no Cefas Action Level 2s for PAHs. The concentrations of THC were found to be high, peaking at 3,630mg/kg. Overall, the concentrations of THC present in the samples recovered in 2018 were less than those encountered during previous surveys.

3.2.2 Mid licence year 6 results

Twenty (20) samples were collected in 2021. In summary, whilst many samples exceeded the Cefas Action Level 1 concentration for metals, the majority were marginal (i.e. only just above the Action Level 1 concentration). There were no action level exceedances for organotins or PCBs with the exception of samples collected in reach 1 and 2 which exceeded both Cefas Action Level 1 (ICES) 7 congeners and 25 congeners. There were also three exceedances of Cefas Action Level 1 for p,p′-DDE (dichlorodiphenyldichloroethene), two in the Tees and one in Hartlepool. There were no Cefas Action Level 2 exceedances. As a result, the MMO confirmed that the condition relating to mid-licence sampling was discharged and the material was considered suitable for sea disposal. The data is provided in **Appendix D**.

3.2.3 Additional mid licence results

Due to an admin error in sample plan advice for the mid licence year 6 sampling, the MMO added condition 5.2.9 to the licence that required '*if disposal of more than 1 million tonnes wet weight is required at Tees Bay A (TY160) in 2022, 2023 or 2024, then additional sediment sampling requirements must be agreed with the MMO'.* A further ten (10) samples where therefore collected based on where the majority of this additional material would be dredged. Sample results indicated some Cefas Action Level 1 exceedances in the metals data, but these were all marginal. There were no action level exceedances for organotins or PCBs and only one exceedance of Cefas Action Level 1 for OCPs. As in previous data, PAHs and PBDEs were elevated but the MMO determined that the material was suitable for sea disposal. The data is provided in **Appendix D**.

3.2.4 Mid licence year 9 results

Thirty-one (31) samples were collected in 2024 to inform the mid-licence sampling condition alongside providing data for the marine licence renewal. The MMO sampling templates with the raw data are provided in **Appendix E** and Cefas' advice regarding the sample results is provided in **Appendix F**. This data indicates that the whilst the majority of samples exceed Cefas Action Level 1, most are only marginal exceedances. The exceptions are concentrations for chromium, lead and zinc although no parameter exceeds Cefas Action Level 2. All samples were found to be below Cefas Action Level 1 for organotins, OCPs and PCBs. As for previous sampling data, the concentrations of PAHs are elevated however the advice received from Cefas (**Appendix F**) indicated that the results were in line with decreasing levels, recognised as being generally elevated in the Tees estuary due to its industrial history, as shown in **Plate 3-1** for low molecular weight PAHs.

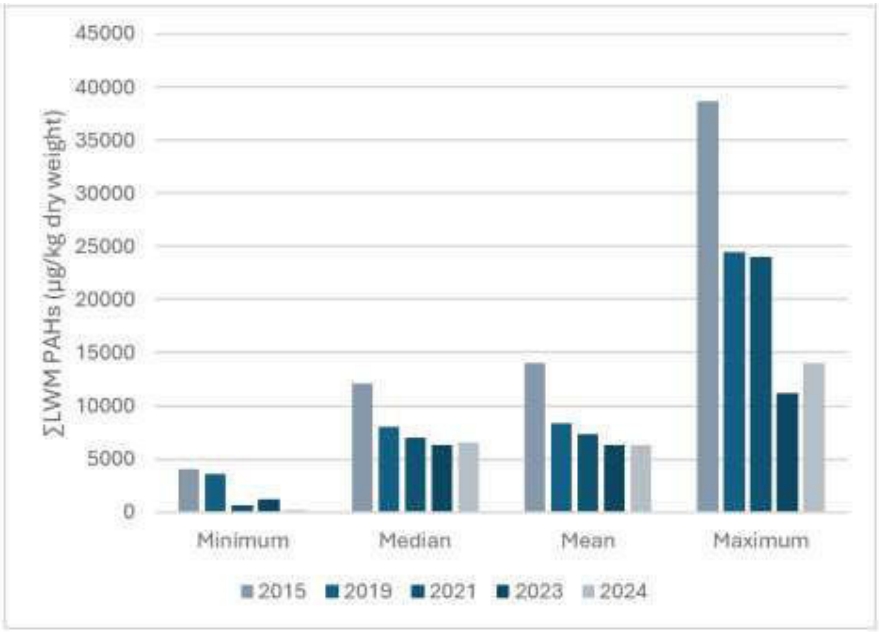


Plate 3-1 Low molecular weight group comparison across the licenced period (reproduced from Cefas sample advice dated 31 January 2025)

In terms of PBDEs, BDE209, 99 and 100 were assessed as being higher than recommendations as per the review of Cefas Action Level work undertaken by Mason *et al*., (2022) although it should be noted that these proposed action levels were never formally implemented. However, once normalised[5] using total organic carbon (TOC) data the MMO deemed the results indicated the material was acceptable for disposal to sea. Given historic manufacture of these chemicals in the area, it is acknowledged by the MMO that elevated PBDEs are to be expected and consequently it is more appropriate to compare data to previous PBDE datasets to look at historical trends (i.e. a decreasing trend indicates the risk is reducing). Given the recent requirement to monitor for PDBEs more regularly for maintenance dredging, this dataset will develop, and the consideration of long-term trends will become easier in future assessments.

3.3 Disposal volumes

A summary of the total volume of dredged material (m³) disposed at Tees Bay A is shown in **Table 3.3**.

Table 3.3 Summary of dredged material at Tees Bay A 2015-2024

Reach	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	62,094	1,500	33,972	2,165	16,509	21,429	19,122	59,178	3737	0
2	29,830	61,722	25,133	22,508	11,379	11,307	30,825	14,532	16802	25156
3	64,998	65,468	33,698	8,501	1,693	8,418	18,694	30,922	25982	3728
4	11,770	12,884	8,771	1,879	2,605	3,699	0	0	32964	4391
5	471	951	0	0	3,270	5,622	219	361	1584	2151
6	10,534	18,383	8,242	8,624	10,618	18,762	6,300	3,995	27944	34401
7	61,866	25,041	3,339	0	0	2,080	28,827	29,813	12927	16749

[5] *A nominal value of 2.5% TOC for normalisation was used for this assessment. However, if values of TOC for the samples are greater than 2.5% the concentrations of PBDEs are reduced and therefore the risk reduced*

Reach	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
8	111,145	37,485	50,317	44,138	44,965	26,931	65,192	107,498	65027	82287
9	230,316	143,677	202,051	121,796	258,315	136,566	220,035	133,262	219604	136276
10	106,326	51,239	44,053	36,072	21,132	5,229	37,904	147,299	67827	46087
11	36,893	64,146	44,546	129,283	12,204	2,702	62,704	76,747	84219	60793
12	4898	11,168	4,796	4,471	10,170	575	451	15,444	52167	700
Tees berths	141,160	173,396	111,221	92,351	75,427	55,129	33,818	81,733	93979	80851
Hartlepool	79,818	92,781	79,936	110,448	39,943	52,907	82,146	40,680	92529	72989
Seaton Channel	0	0	71,803	41,712	15,951	0	0	0	8044	25528
Other	23,972	58,842	0	53,880	17,183	0	0	0	0	0

3.4 Mechanism of disposal

All maintenance dredged material is disposed of at Tees Bay A (TY160) via bottom door release. This disposal site comprises 12 areas, as shown on **Figure 3-3** and each area receives dredged material during a certain month of the year, with the volume of disposed material varying during each month to avoid mounding of material at one location. As an average, for the months January to November between 80,000m^3 and 92,000m^3 are deposited in each area. Volumes are slightly less for December as the port closes down for two weeks over the Christmas period. The location of dredge areas and positioning of vessels within the disposal site are controlled using the integrated navigation, survey and dredge control software, with final locations for disposal confirmed and recorded within the Port Operation Centre Vessel Traffic Services (VTS) system.

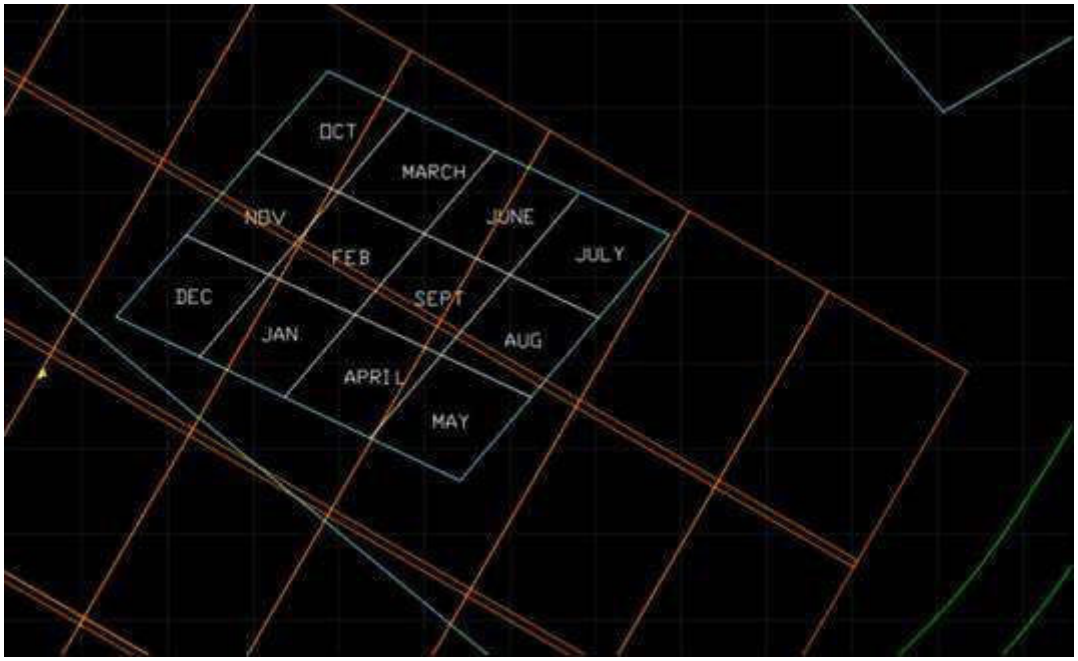


Figure 3-3 Tees Bay A management areas

3.5 Disposal site monitoring (Cefas)

The last disposal site monitoring assessment for the MMO was undertaken by Cefas at the Tees Bay A disposal site in 2024 (Cefas, 2024). This monitoring represents a continuation of the disposal site monitoring programme formally known as SLAB5 which ceased at the end of March 2015. From April 2015, the monitoring programme is now referred to as C6794. The survey consisted of two samples within the disposal site and 11 sites outside and analysis for PSA, organic carbon and sediment contaminants PAHs and organohalogens (including PCBs and PBDEs). Results indicate that the sediments within and surrounding the Tees disposal sites were predominantly unimodal sands, muddy sands and some sandy muds, with small but varying amounts of gravel. Organic carbon values ranged from 0.14% to 6.09% in the <2mm sediment fraction, the highest values generally being observed within disposal site boundary. In terms of contaminants, the data indicated that there has been no evident change in sediment contaminant concentrations within and around the disposal site compared to data previously sampled under this project.

3.6 Beneficial use of dredged material

Where suitable, a proportion of dredged arisings for alternative (beneficial) use within the estuary have been identified (alternative use considerations are a legal requirement of the marine licensing process for disposal of dredged material under the Waste Framework Directive). To date, material has been provided to the River Tees Trust for habitat improvement to areas of currently degraded intertidal in the Newport Bridge area of the Tees. This comprised the installation of a ‘green-wall’ in front of the existing retaining wall, reprofiling and placement of geotextile bags filled with maintenance dredged material. The "Emerald Duchess" side-cast discharge arm for managed replenishment of intertidal areas is available for use in these projects.

4 Environmental Management

PD Teesport Limited have developed an Environmental, Social and Governance (ESG) strategy[6] which sets out 17 targets to deliver three goals aligned with safeguarding the environment, supporting people and strong governance. In terms of the target relating to improving biodiversity, a commitment to ongoing engagement with Industry Nature Conservation Association (INCA) to undertake biodiversity assessments and investigate ongoing opportunities to increase biodiversity has been made. Examples of projects to date are the support provided to the Tees Rivers Trust to restore marine habitats (including seagrass), improvements for spawning fish at Hartlepool Dock and the environmental DNA (eDNA) project reported in **Section 6.3.2.1**.

Vessels are also operated under the requirements of the International Safety Management Code for the Safe Operation of Ships and for Pollution Prevention (the 'ISM' code) which is then externally audited by the Maritime and Coastguard Agency (MCA). The most recent audit by the MCA did not identify any areas of non-compliance. Operational activities are also undertaken in compliance with an Environmental Management System (EMS) meeting ISO14001 requirements and the PD Ports Group Environmental Policy Statement last updated in 2023 and provided in **Appendix G**.

An oil spill contingency plan is also place which has been developed for use in the event of an operational incident. Alongside the sediment sampling as detailed in **Section 3.2**, there are also several licence conditions that the port complies with to protect the marine environment as detailed in **Table 4.1**.

Table 4.1 Summary of current licence conditions

Condition	Description	Reason
5.2.1	The licence holder must report any oil, fuel or chemical spill within the marine environment to the MMO Marine Pollution Response Team within 12 hours. Within office hours: 0300 200 2024. Outside office hours: 07770 977 825. At all times if other numbers are unavailable: 0845 051 8486. dispersants@marinemanagement.org.uk	To ensure that any spills are appropriately recorded and managed to minimise impact to sensitive receptors and the marine environment.
5.2.2	Any man-made material must be separated from the dredged material and disposed of to land.	To exclude the disposal at sea of man-made material such as shopping trolleys, masonry, paint cans etc.
5.2.8	Bunding and/or storage facilities must contain and prevent the release of fuel, oils, and chemicals associated with plant, refuelling and construction equipment, into the marine environment. Secondary containment must be used with a capacity of no less than 110% of the container's storage capacity.	To minimise the risk of marine pollution incidents.

The risk of spreading Invasive non-native species (INNS) is monitored via the eDNA project alongside employing biosecurity measures in accordance with the following requirements:

- International Convention for the Prevention of Pollution from Ships (MARPOL). The MARPOL sets out appropriate vessel maintenance;
- The International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention), which provide global regulations to control the transfer of potentially invasive species;
- The Environmental Damage (Prevention and Remediation) (England) Regulations 2015, which set out a polluter pays principle where the operators who cause a risk of significant damage or cause significant damage to land, water or biodiversity will have the responsibility to prevent damage

[6] PDPorts_ESG_Landscape_Screen.pdf

occurring, or if the damage does occur will have the duty to reinstate the environment to the original condition; and

- The Merchant Shipping (Control and Management of Ships' Ballast Water and Sediments) Regulations 2022, along with associated guidance published in Merchant Shipping Note 1908 and Marine Guidance Note 675.

5 Consents and Licences

Part 4 of the Marine and Coastal Access Act 2009 (MCAA) provides a framework for the licensing of activities below the level of mean high water spring (MHWS) tides. A full list of marine licences issued in the study area following the publication of the original document are summarised in **Appendix H**. Where licences require dredge and disposal and therefore could impact or have impacted on the maintenance dredging activities, these are summarised in **Table 5.1**.

Table 5.1 Marine licences issued which may impact on maintenance dredging activities

Licence reference	Date granted	Description	Status	Effect on maintenance dredging activities
Deemed marine licence. The York Potash Harbour Facilities Order 2016	2016	The Order permits Anglo American to carry out construction of a new quay, capital dredging and disposal and enhancement works in Bran Sands lagoon.	Not yet commenced	The predicted effect of the scheme will be a localised redistribution of (existing) sediment deposition, in response to predicted changes in current speeds. It is predicted that this very small change in the overall fine sediment regime will not alter the present frequency of, or methodology used for maintenance dredging and no effect on sediment supply to intertidal areas throughout the Tees estuary will occur. Overall, no effect on the overall sedimentary regime of the Tees estuary is predicted following construction and no alteration to the present frequency of maintenance dredging is anticipated (Royal HaskoningDHV, 2015).
L/2017/00012	02/03/17	Able Seaton Port Berths, Holding Basin and Channel – replaced licence L/2012/00160/8. Dredging to 6.5m CD with offshore disposal to improve access into Able Seaton Port. The licence includes a capital dredge to deepen the approach channel and maintenance dredging thereafter to retain access. Dredge campaigns have been completed in May 2019 (6,935 tonnes), September 2020 (81,447 tonnes), November 2020 (2,480 tonnes) and December 2020 (28,520 tonnes) with disposal at Tees Bay A disposal site. The latest licence variation is (L/2017/00012/11) ending 1 March 2026.	Completed in 2024	No effect
L/2020/00353	20/10/20	Teesside Gas Port - dispose of up to 92,000m^3 of capital dredged material from the Tees estuary to the Tees Bay C offshore disposal site. The marine licence end date is 28th February 2024. The licence variation (L/2020/00353/1) granted 10 August 2023 increased the dredge volume to 122,200m^3 and extended the licence expiry to 28 February 2026.	Not complete	No effect
L/2021/00354	02/03/22	NGCT - undertake construction of a container terminal, disposal of dredged material offshore, removal of infrastructure within the NGCT footprint, reclamation (if	Not yet commenced	No requirement to adjust the maintenance dredging strategy during the operational phase (i.e. the annual maintenance dredge volume is not predicted to change

Licence reference	Date granted	Description	Status	Effect on maintenance dredging activities
		required) and habitat enhancement using maintenance dredged material. The licence variation (L/2021/00354/2) granted 15 December 2023 was as a result of a request from the MMO to amend condition 5.2.7. The marine licence end date is 31 December 2029.		significantly beyond the existing variability already managed by the port)
L/2021/00333 and L/2021/00433	17/12/21 07/02/22	South Bank Quay. South Tees Development Limited hold two marine licences for the South Bank Quay project (one for Phase 1 and another for Phase 2). These licences permit capital dredging, offshore disposal, demolition and placement of rock.	Phase 1 complete. Phase 2 not yet commenced.	All works covered by the Phase 1 licence are now completed. Modelled reductions in current speeds in the reach of the channel local to the South Bank Quay, combined with the creation of a new berth pocket at the quay, may lead to a small increase in deposition rates and hence a requirement for more material to be removed from this reach annually. However, the potential increase in maintenance dredging requirement is not expected to be significant and is considered to be manageable within existing maintenance dredging and offshore disposal regimes (i.e. no change in the existing maintenance dredging strategy is envisaged).
L/2021/00383	10/11/21	Deepening of existing berth at Dawson's No 2 from -4.5m CD to -7m CD. A capital dredge amount of 8,500m^3 will be removed from Dawson's Wharf to be disposed at Tees Bay C disposal site. The licence end date is 9 November 2024.	Commenced but not yet complete	Expected maintenance requirement to fall under the existing maintenance dredging regime
L/2021/00325	20/10/21	Capital dredging at new Ro-Ro 2 berth to create the new berthing pocket and enable access to the pontoon linkspan and pontoon. This is part of wider replacement works consented under the licence. The licence end date is 19 October 2024 however, dredging works were completed in September 2022.	Completed	As a result of the proposed scheme, the maintenance dredging strategy will be adjusted to incorporate the newly deepened berth, although no significant changes to the requirements for maintenance dredging within Tees Dock are expected.
L/2021/00377	08/12/21	Dredge deepening of Port of Middlesbrough (POM) 1 and POM 2. To deepen the dredge depth to -9.5m CD a capital dredge of 11,500m^3 is required. The berth has previously been dredged to a maximum of -8.5m CD and maintained under the existing maintenance licence. The works commenced in January 2022.	Completed	Maintenance requirement to fall under the existing maintenance dredging regime
L/2022/00407/1	13/03/23	North Sea Supply Base Quay 1 Extension. Project to support the extension of berthage at the Port of Middlesbrough through capital dredging. The berth will consist of an area of	Not yet commenced	Maintenance requirement to fall under the existing maintenance dredging regime

Licence reference	Date granted	Description	Status	Effect on maintenance dredging activities
		150x35m and to a depth of 9.5 below CD. Removal of a maximum of 8,100m^3 of material to be removed and disposed of at Port Clarence waste treatment facility. The licence consents the capital dredge of a further 35,100m^3 to be disposed of at Tees Bay C disposal site (TY150). Works commenced 9 May 2023.		
L/2024/00042/1	22/04/24	The proposed scheme is to upgrade the existing Riverside Ro-Ro facility, located on the southern bank of the Tees estuary immediately upstream of Dabholm Gut. The proposed scheme is required to allow PD Teesport to operate a wider range of vessels at the Riverside Ro-Ro berth. The scheme requires construction of a new fixed ramp landing platform, removal of an existing mooring dolphin, installation of new mooring dolphins and a new walkway, minor alterations to existing moor bollards, minor highway works within the PD Port's estate, dredging and offshore disposal of dredged material.	Not yet commenced	Maintenance requirement to fall under the existing maintenance dredging regime

6 Environmental Information

6.1 Hydrodynamics and morphology

The morphology of the coast in the vicinity of the Tees estuary is constrained by the Permian Magnesium Limestone outcrop at the Heugh at Hartlepool and a sandstone outcrop at Redcar. Between these outcrops, Tees Bay has few rock exposures and mostly consists of boulder clay and alluvial deposits up to 30m thick overlying Sandstone and topped by beach sand. Prior to the mid-19th century, the Tees estuary was a wide, shallow estuary bordered by extensive wetlands and had tidal ingress for about 44km from the mouth. Since this time, the estuary has undergone substantial anthropogenic changes as the channel was trained, land was reclaimed and the channel deepened to its present depth.

At the mouth of the estuary, the current depth is determined as being double that of the natural level without dredging activities. As detailed in **Section 2.2** the present channel has declared depths of 15.4m bCD in the approach channel (i.e. in Tees Bay), 14.1m bCD to upstream of Redcar Ore Terminal, 10.4m bCD up to Teesport and then progressively less depth up to 4.5m bCD in Billingham Reach.

Changes to the channel over the last 10 years have included a variation in 2020 to deepen the channel from an advertised depth of 5.1m bCD to 5.7m bCD in the upper reaches (see **Table 1.1** variation 5) and a realignment of the Hartlepool channel via marine licence reference L/2019/00328/1 (see **Table 1.1**).

The most recent major anthropogenic influence on the Tees has been the construction of the Tees Barrage in the mid-1990s however activities over the last 150 years have resulted in a narrow canalised channel partly trained by historic training walls. Seal Sands is divided from the other intertidal areas by Seaton Channel. A summary of baseline parameters for hydromorphology is provided in **Table 6.1**.

Table 6.1 Summary of hydrodynamic parameters in the Tees estuary

Parameter	Description
Tidal levels	Tide at the mouth is sinusoidal in nature with ranges of 4.6m to 2.3m of mean spring and neap tides.
Fluvial flow	The river Tees has its source about 160km from the sea on Cross Fell in the Pennines and drains a catchment of 1,932km^2. The main freshwater input to the estuary is measured at Low Moor. This flow is further regulated by the Tees Barrage which is operated to maintain upstream water levels and prevent the upstream penetration of saline water. The regulated (as a result of the barrage) freshwater flow enters the estuary and partially mixes with saline water entering through the estuary mouth. This partial mixing and the longitudinal salinity gradient both contribute to a density driven gravitational circulation. This effect is a result of the density changing the vertical profile of the flow such that the ebb flows are strong at the surface whereas the flood flows are more evenly spread through depth.
Waves	Wave conditions in the Tees estuary are a combination of offshore swell and locally generated wind waves. The direction from which swell can enter the estuary is limited by the North Gare and South Gare Breakwaters. Into the estuary, upstream of the ConocoPhillips Dock area, only remnants of the swell wave energy combined with short period local wind waves are to be expected due to the limitation in the penetration of swell waves into the estuary as a result of the North Gare and South Gare breakwaters.
Sediment concentrations	In general, suspended sediment concentrations are low within the estuary and within the Bay. The highest observed values tend to occur on spring tides. This relationship is not strong, but the extreme values are also attributed to either high rainfall or storm events. In general, the suspended sediment concentrations appear to be dominated by freshwater inputs above Middlesbrough Reach and marine influences further downstream.
Estuary morphology	The present estuary morphology can be considered to be almost entirely man-made; 150 years of channel and entrance training works, reclamation and dredging have resulted in an estuary that is essentially a narrow ‘canalised’ channel. Overall, approximately 15% of the intertidal area calculated for the pre-1800 situation remains. Seal Sands covers 140ha with approximately 300ha covered by Bran and North Gare Sands at the estuary mouth. The remnant intertidal areas are partly constrained by training works.

The most recent PSA data was collected in 2024 as part of the sediment sampling to inform year 9 of the existing marine licence and for its renewal. Sediment data was collected at 31 sites as shown in **Figure 6-1**. This data indicated that sediment composition is predominantly composed of silt/clay (69% -98%) followed by sand (1% - 31%) and little to no gravel (0% - 2%) excluding samples 24 (reach 9) and 25 (reach 10) which were both predominantly composed of sand (64%) followed by silt/clay (36%) with little to no gravel. This was considered by Cefas to be in line with previous data and current licenced material type.

Tees Bay is reported to have tidal regime driven from the North Sea, which originates in the north and travels south (AECOM, 2021). The tide is semi-diurnal, repeating every 12.5-13 hours, with a macro-tidal range of 4.6m for a mean spring tide and meso-tidal range of 2.3m for a mean neap tide. Tidal velocities are generally low, reaching up to 0.25m/s to 0.3m/s. The flood tide direction in the Bay is southeast and the ebb direction northwest (EDF Energy, n.d.). The sediment regime in the area includes surface seabed sediments, suspended sediments and a variety of sources and sinks. Silts and muds are readily transported as suspended sediment load and can remain in suspension for extended periods through the tidal cycle, while coarser sands and gravels may only be mobilised at times of peak hydrodynamic forcing carried as bedload. Suspended sediment concentrations between 1,500 and 4,000mg/l have been measured at exposed locations during peak wave events (EDF Energy, no date). As a result of the relatively low tidal currents, there is a tendency for suspended sediments (either from the river or entering the mouth from the North Sea) to become deposited over time.

Coatham Sands (to the east of the mouth) is protected at the western end by nearshore slag banks exposed at low water and known as the German Charlies. The Redcar seafront then extends as a defended headland for around 1.5km further east. The headland results from the outcropping rocks of Coatham Rocks and Redcar Rocks (Royal HaskoningDHV, 2014).

Hartlepool Headland and, by way of an accentuation of its effect, The Heugh breakwater, causes a wave sheltering effect and induces a tidal current gyre in its lee at the northern end of Hartlepool Bay. As a consequence, there is a deposition of sand in the navigation approach channel to Victoria Harbour. Due to their sheltered locations, there is also deposition of sand in the harbour and marina berths.

6.1.1 Technical note 01 – Coastal processes overview

In 2011, PD Teesport Limited commissioned a coastal processes overview to provide a background description of the physical processes and morphological features in Tees Bay and along the Redcar frontage (Royal HaskoningDHV, 2012). This was to provide a basis for assessment of the potential, or otherwise, for maintenance dredging activities to affect beach processes in the vicinity of Coatham Sands and Redcar Sands (see **Figure 6-2**). Based upon the findings of the overview, the following main conclusions were drawn relating to the potential impacts of maintenance dredging activities on adjacent beaches, and in particular on the Redcar frontage. The study concluded that material removed during maintenance dredging activities would only have the potential to feed the adjacent beaches and nearshore zones if the following two physical conditions were met:

1. That the sediment was of an appropriate grain size; and
2. That a mechanism existed for the mobilisation and transport of this sediment to the adjacent beaches.

Based upon dredging and disposal records, a large proportion of the material dredged during maintenance activities is of potential beach-building grain size (~75%, equivalent to ~925,500m³ annually). However, only a small proportion of this sandy material (~5½%, equivalent to ~51,288m³ annually) would have a natural mechanism for its transport to adjacent beaches (this represents around 4% of the total average annual maintenance dredge of all material types). This is due largely to both:

- The flood dominance of the River Tees estuary, which encourages the estuary to act as a sink for sediments, and
- The formation of tidally induced gyres in the lee of Hartlepool Headland and just to the south-east of the River Tees Approach Channel, which locally reverse the predominant sediment transport direction.

The above volumes were considered to be small within the context of natural variations in beach volumes that can be caused by seasonal wave and tide climates and specific storm events. It was therefore considered that the protruding nature of the Redcar frontage as a promontory from the natural coastal alignment is a far greater cause of beach level fluctuations.

6.1.2 Technical note 02 – Updated beach volume changes

Using updated survey data, the beach analysis detailed above was updated. A summary of the findings is presented in **Table 6.2**.

Table 6.2 Findings of updated survey work

Beach	Survey update
Coatham Sands	In autumn 2011 and autumn 2012 reported substantial net gains of sediment (149,715m³ and 100,605m³, respectively).
Redcar Sands	A small net gain (14,145m³) between spring and autumn 2011, a very small net loss (-205m³) between autumn 2011 and spring 2012, a modest net gain (32,845m³) between spring and autumn 2012 and a significant net loss (84,660m³) between autumn 2012 and spring 2013.
Marske Sands	In autumn 2011 and autumn 2012, both reporting substantial net gains of sediment (61,725m³ and 207,045m³, respectively).
Saltburn Sands	Successive net gains of modest magnitudes between spring 2011, autumn 2011, spring 2012 and autumn 2012 (cumulatively 40,830m³) but a large loss between autumn 2012 and spring 2013 (60,855m³).

When considering the four frontages as a continuous beach, the changes between autumn 2008 and autumn 2012 indicate a net gain of 706,015m³. This suggested that under typical conditions, the frontage is generally depositional, but particular seasons or storm events can temporarily remove sediment from parts of the frontage. This has been noted markedly between autumn 2012 and spring 2013 along Redcar Sands and Saltburn Sands when a net loss of -145,515m³ has been recorded on these two frontages alone (Coatham Sands and Markse Sands are not surveyed in the spring surveys). Such large net volumes of accretion having occurred during a period when maintenance dredging has been ongoing suggests that there is no direct adverse impact associated between maintenance dredging and beach levels at Redcar. Furthermore, the natural variability in beach levels and volumes can be marked at frontages, including Redcar, as part of natural seasonal patterns or storm-related responses.

6.1.3 South Gare to Hunt Cliff Beach Management Plan

Following low levels after Storm Babet, a further beach trends analysis was undertaken (Royal HaskoningDHV, 2024). In summary, the following conclusions were reached:

- The overall planform shape appears to be relatively stable and is determined by headlands, outcrops or man-made control features.
- Future sea level rise, however, will impact this plan form and dunes, such as Coatham Dunes will migrate landwards and cliff erosion rates might increase.
- There is a limited amount of net sediment drift across these frontages but there is some connectivity along the beaches between various frontages.

- There is only limited sediment input into the system from the River Tees and Saltburn Scar is thought to block sediment loss further to the east.
- The local variability of the beach is storm driven, particularly storms with high waves which originate from specific directions.
- Beaches along most of this stretch of coast are rapidly lowered during storms and progressively built back up during calm periods.

This study supports the findings of the previous technical notes that variability in beach volumes is related to storm and natural accretion following storms. There is therefore no evidence to suggest that ongoing maintenance dredging has a significant effect along this frontage. It should also be noted that Storm Babet caused considerable damage to both the North and South Gare breakwaters which now require extensive repairs and reconstruction, likely to be spread out over a number of years.

450000

455000

530000

525000

HARTLEPOOL CHANNEL

TEES ESTUARY

N

West View Road

Croft Gardens

War Memorial Garden

Seaton Carew

Tees Road

Paddy's Hole

Powder Hole

Seal Sands Road

Cowpen Bewley

Belasis Avenue

Port Clarence Road

Seaton Carew Road

Haverton Hill Road

Middlehaven

Billingham Beck

Dockside Road

South Bank

Grangetown

Tees Dock Road

Trunk Road

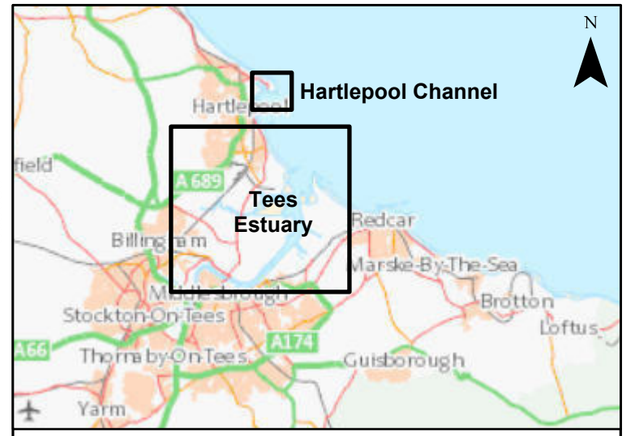
River Tees

0 500 Metres

Scale on A3: 1:20,000

Scale on A3: 1:40,000

0 500 1,000 Metres



Legend

- Maintained areas

PSA distribution for Year 9 sample location

- Gravel
- Very coarse and coarse sand
- Sand
- Medium sand
- Fine sand and very fine sand
- Silt/Clay

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Year 9 sediment sample locations and particle size analysis

Figure: 6.1

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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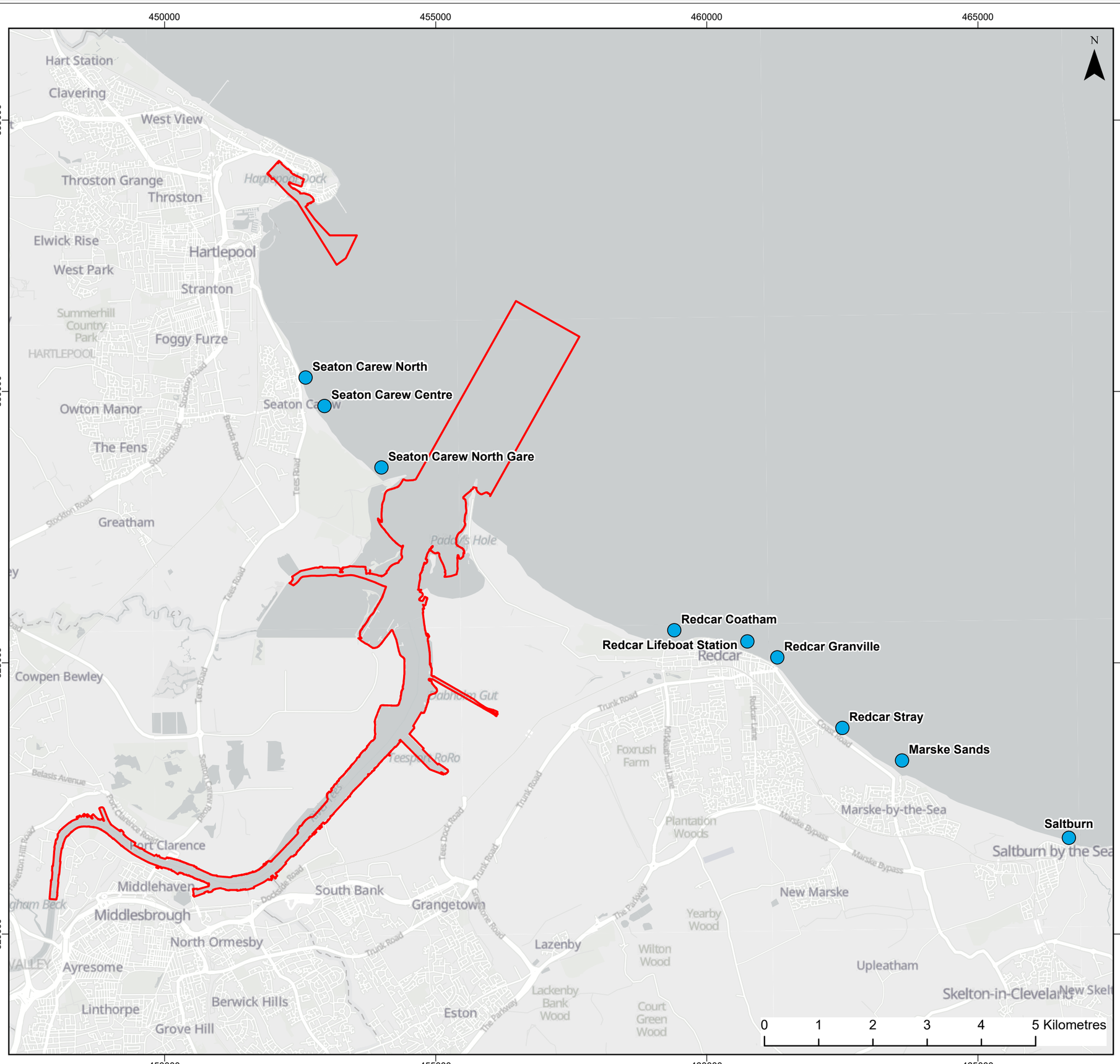

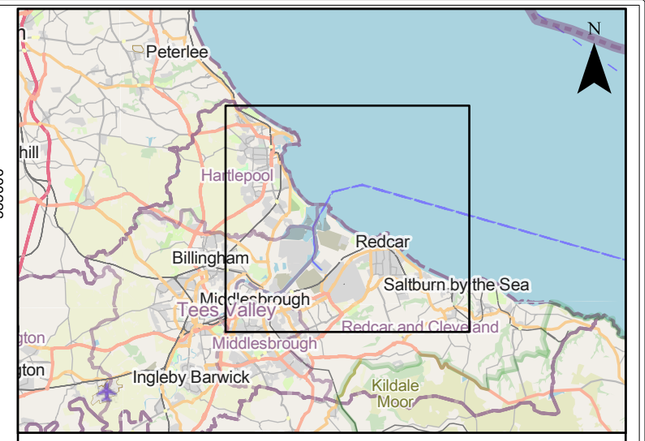

Legend

Maintained areas

Bathing Waters Monitoring Location

Bathing Waters Monitoring Location

Client:	Project:
PD Teesport Limited	Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Designated bathing waters

Figure: 6.2

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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6.1.4 Disposal site hydrodynamics

In terms of hydrodynamic information at the disposal site, sediment sampling at the disposal site- from the estuary and from a dredger hopper, looked at contents of fines at each location (HR Wallingford, 1998). Fine percentages were relatively high in both the estuary and in the hopper but at the disposal site, fine percentages were very small (3-34%). This study suggests that dispersion during disposal is effective. Measurements of suspended sediment concentrations collected close to the disposal site did not indicate any disposal influence, rather concentrations varied in patterns associated with the tidal cycle. Bed concentrations were also shown to be heavily influenced by wave conditions (HR Wallingford, 2000).

As part of the NGCT project, plume modelling was undertaken for disposal at both the Tees Bay A disposal site and Tees Bay C disposal site, as both sites were under consideration for placement of dredged material (Royal HaskoningDHV, 2006). Simulations were undertaken over an entire spring-neap cycle and the results for Tees Bay A are shown in **Figure 6-3** and **Figure 6-4** for predicted suspended sediment concentrations and peak deposition associated with the disposal of fine material model runs respectively (considered to be worst case for effects outside of the disposal site area). The figures show that dispersion under calm (no wave conditions) illustrate that most of the fines deposited remain close to the point of disposal. Concentrations of sediments are increased by approximately 5mg/l within an area 2km from the boundary of the disposal area. Peak deposition depths greater than 1mm were not predicted outside the boundary of the disposal areas during the simulation. With respect to the disposal of coarser material, such as sand, some short-term build up of fine sandy sediment was predicted but this would be dispersed over time.

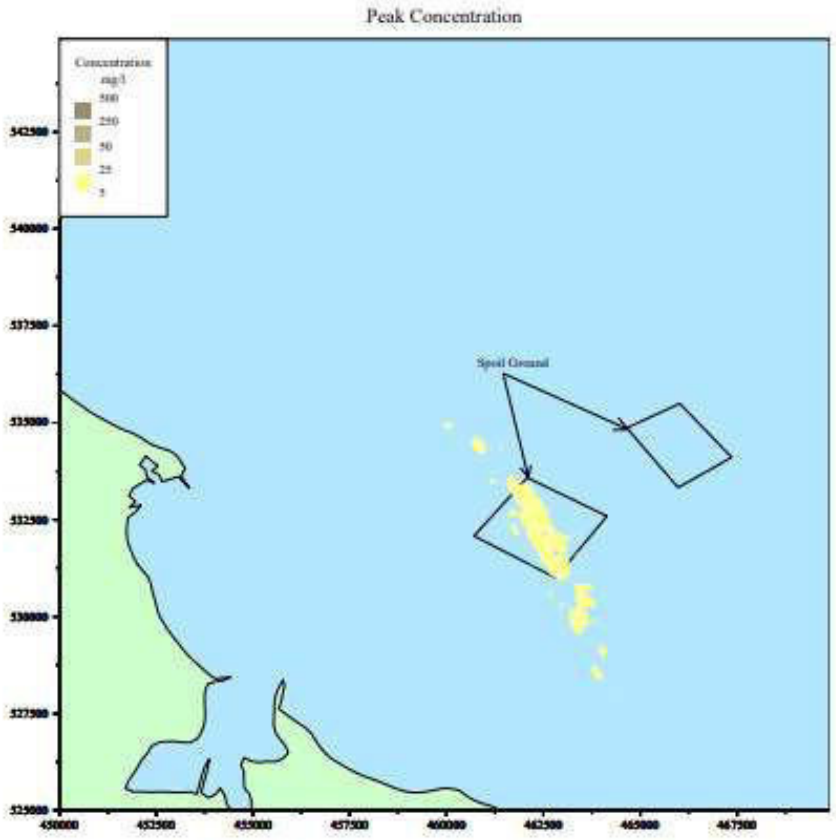


Figure 6-3 Simulated peak concentration for disposal operations at Tees Bay A (NGCT ES)

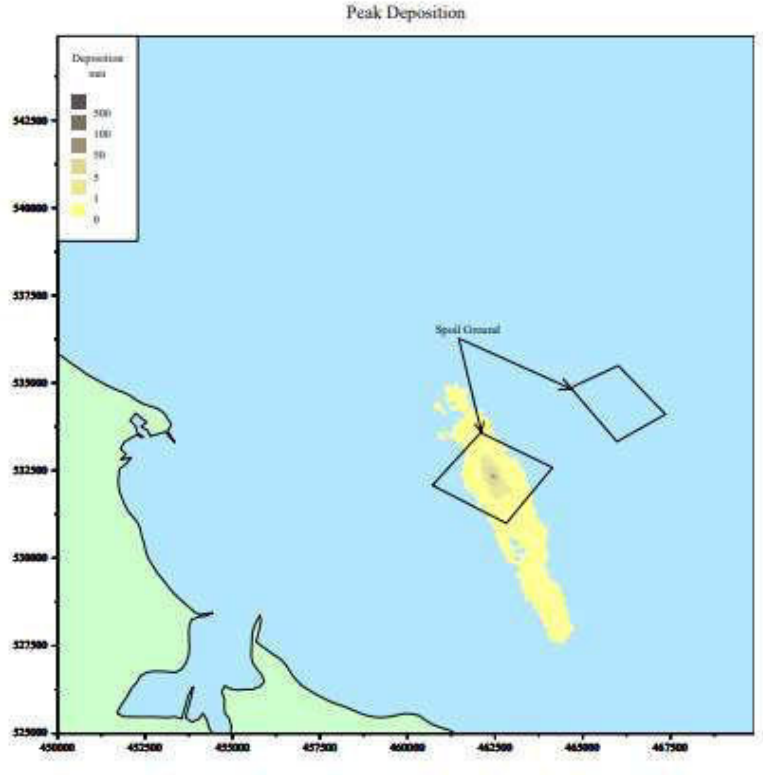


Figure 6-4 Simulated peak deposition for disposal operations at Tees Bay A (NGCT ES)

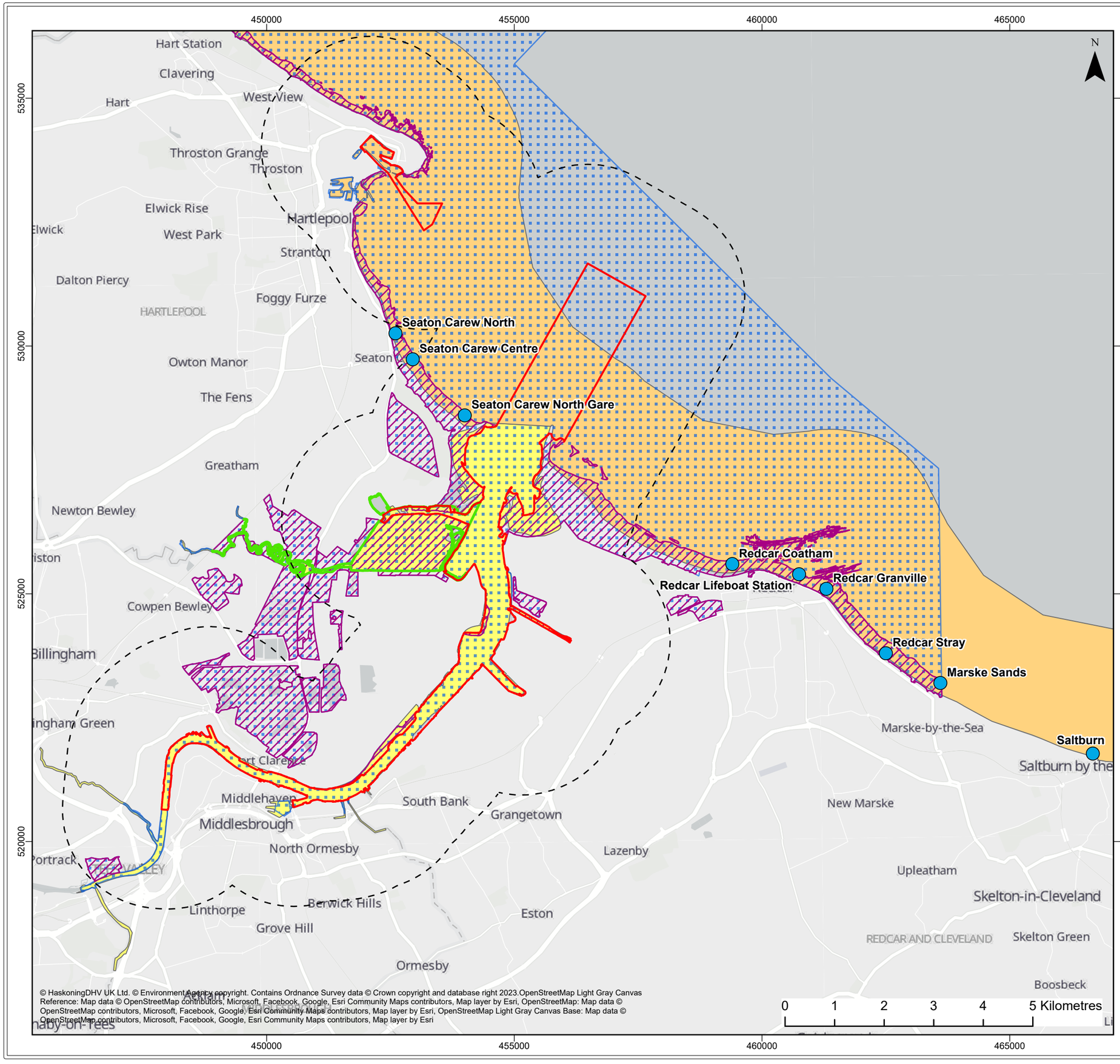
6.2 Water quality

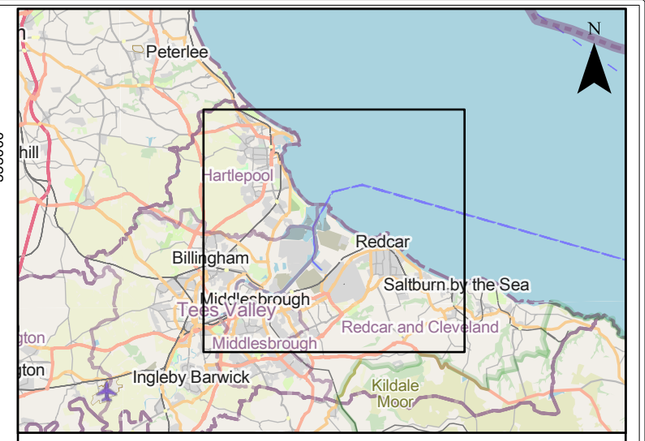
The Water Framework Directive (WFD) is transposed into national law by means of the Water Environment (WFD) (England and Wales) Regulations 2017 (as amended) (WER). These Regulations provide for the implementation of the WFD, from designation of all surface waters (rivers, lakes, transitional (estuarine) and coastal waters and ground waters) as water bodies to the requirement for achievement of good ecological status or good ecological potential by 2027.

The WER provides the main mechanism to control and improve water quality in all types of watercourses, alongside ensuring that water bodies meet certain requirements for marine ecology and hydromorphology. European designated sites (now known as sites part of the National Site Network in the UK) are also recognised under the WFD as protected areas and therefore the monitoring in place to ensure compliance with this directive are relevant to this baseline document.

The relevant water bodies are shown in **Figure 6-5** and are listed below:

- Tees transitional water body (GB510302509900); and
- Tees coastal water body (GB650301500005).





Legend

- Maintained areas
- 2km buffer
- WER Transitional Waterbody: TEES (GB510302509900)
- WER Coastal Waterbody: Tees Coastal (GB650301500005)
- Sensitive Area Eutrophic Coastal Area: Seal Sands
- Bathing Waters Monitoring Location
- Teesmouth and Cleveland Coast Special Protection Area (SPA)
- Teesmouth and Cleveland Coast Ramsar Site

Client: PD Teesport Limited	Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Water Framework Directive Water Bodies and Protected Areas

Figure: 6.5

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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Summaries of the baseline information available regarding the status and objectives of the above water bodies with a focus on water quality parameters are provided in **Table 6.3.** Note that results of water quality sampling which informs WER compliance undertaken by the Environment Agency can be found at Open WIMS data. This data site allows a site-specific search of Environment Agency monitoring points and viewing of individual sample results.

Table 6.3 Water body information relating to water quality

Water body parameter	Water body	
WFD water body name	Tees Coastal	Tees
Water body ID	GB650301500005	GB510302509900
Water body type (estuarine or coastal)	Coastal	Transitional (heavily modified)
Water body total area (km^2)	88.442	11.481
Overall water body status (2019)	Moderate	Moderate
Ecological status (focus on water quality parameters contributing to ecological status)	Moderate – no specific water quality issues identified.	Moderate (with respect to water quality parameters - dissolved inorganic nitrogen (DIN))
Chemical status (2019)	Fail (due to concentrations of PBDEs and mercury)	Fail (due to concentrations of PBDEs, benzo(g,h,i)perylene, mercury, tributyl tin (TBT) and cypermethrin)
Target water body status and deadline	Good (2027)	Variable depending on parameter – PBDEs by 2063 as a result of natural conditions: chemical status recovery time
Reasons for not achieving good (RNAG) with respect to water quality parameters	None specifically identified in relation to water quality parameters	Poor nutrient management – rural and agricultural land management (DIN), contaminated water body bed sediments (TBT), sewage and trade discharges (DIN)

In summary, both water bodies are at moderate overall status and are failing chemical status. This is due to levels of flame-retardant compounds PBDEs and mercury and its compounds. The Tees transitional water body also fails for benzo(g,h,i) perylene, organotin compounds and an insecticide; cypermethrin. Dissolved inorganic nutrient (DIN) concentrations are also contributing to moderate ecological status within the transitional water body.

PBDEs are an emerging contaminant of concern for which information on concentration levels around the UK is poor. With respect to PBDEs, all surface water sites assessed under the WERs are above the biota environmental quality standard (EQS) (2013/39/EU) of 0.0085 micrograms per kilogram (µg/kg) wet weight for PBDEs in fish. Monitoring against this standard was introduced in 2019 and consequently classification status updates for the water bodies on Catchment Data Explorer indicate that the presence of PBDEs is widespread and at levels significantly above the biota EQS in all surface water bodies across the UK. This is due to PBDEs being released during use and disposal of old consumer products used in homes and businesses containing PBDEs (Environment Agency, 2021). Additionally, PBDEs have been manufactured/handled within the Tees catchment.

Much of the PBDEs in wastewater treatment works partition to the sewage sludge; however, there are continuing widespread low level emissions of PBDEs to surface waters via wastewater treatment works effluent. PBDEs are also present in soil resulting from the spreading of sludge to land which are then washed

into the water environment by rainfall. PBDEs may also be released into the water column by the re-suspension of contaminated sediment or the transformation of BDE209, which is still in use in industrial products, to smaller congeners (Environment Agency, 2021). However significant reductions in release of these parameters have been reported over the last 10 years by the Environment Agency.

With respect to mercury, earlier classifications in both water bodies previously passed the EQS for mercury. As for PBDEs, failure of mercury and its compounds is a wide scale issue across the UK. This is thought to be due to the replacement of a water based EQS with a biota based EQS which is considered to be more sensitive. There is a growing body of evidence to suggest that atmospheric sources from non-OSPAR assessment countries contribute significantly to the total load of mercury entering surface waters, together with re-suspension and release of mercury from historically contaminated sediment (OSPAR, 2017).

Regarding PAHs, the Tees transitional WFD water body fails for the PAH benzo(g-h-i)perylene but all other PAHs achieve their respective EQS'. PAHs are ubiquitous in the environment, with natural background levels resulting from organic material, diagenesis and biosynthesis. A significant fraction of PAHs is also due to anthropogenic sources and widespread occurrence largely result from formation and release during the incomplete combustion of coal, oil, petrol and wood. PAHs are also components of petroleum and its products and therefore reach the marine environment via sewage discharges, surface run-off, industrial discharges, oil spillages and deposition from the atmosphere (Environment Agency, 2019).

6.2.1 Protected areas

The SPA is included as a protected area and Seal Sands is designated under the Urban Wastewater Treatment Directive (UWWTD) relating to eutrophication pressures. The UWWTD serves to promote high water quality standards in areas particularly sensitive to pollution. Seal Sands was designated as Sensitive (Eutrophic) under this Directive in June 2002 and as a consequence, Billingham Sewage Treatment Works (STW) and Bran Sands STW were selected to receive further treatment to reduce the levels of nitrogen and phosphorus in the final effluent. The nutrient removal scheme also involved the diversion of the effluent to Seaton Carew long sea outfall.

There are three bathing waters within 2km of the dredge boundary. Although designated bathing waters come under the umbrella of protected areas, they are protected by their own legislation 'The Bathing Water Regulations 2013'. Parameters assessed are Escherichia coli and Intestinal enterococci and there are four compliance categories – excellent, good, sufficient and poor. Compliance information for the bathing waters in the study area is presented in **Table 6.4**.

Table 6.4 Bathing water information for those within 2km of the maintenance dredge channel[7]

Bathing water	Description	Compliance category (2024)	Pressures notes
Seaton Carew North Gare	Southern end of an extensive sandy beach close to the mouth of the Tees.	Excellent	These bathing waters are all subject to short term pollution procedures associated with bacteria that get washed into the sea from livestock, sewage and urban drainage via rivers and streams. There is no mention of maintenance dredging practices impacting on this bathing water. Significant investment in water company discharges has occurred including the construction of a long sea outfall which diverted flows 4km offshore to improve and protect bathing water quality at the Seaton Carew beaches. In 2000, a treatment works was built at Seaton Carew and the sewage flowing to the long sea outfall has since received full treatment and
Seaton Carew Centre	Southern end of an extensive sandy beach fronting the town of Seaton Carew, approximately 1.5km north of the mouth of the Tees estuary.	Good	

[7] *Bathing water profile*

Bathing water	Description	Compliance category (2024)	Pressures notes
Seaton Carew North	Northern end of an extensive sandy beach fronting the town of Seaton Carew, approximately 2.5km north of the estuary mouth.	Excellent	disinfection using ultraviolet light. In 2007, the discharge from Billingham Sewage Treatment Works was diverted from its previous location to this long outfall to ensure that it had no adverse effect on Seal Sands. The location of the outfall and the level of treatment mean that these discharges have no perceptible impact on bathing water quality.

6.3 Marine ecology

6.3.1 Intertidal ecology

As outlined in **Section 6.1**, reclaiming of land and rise in sea levels due to climate change means much of the intertidal habitat around the Tees has significantly reduced. A desk-based assessment has been conducted using the MAGIC mapping tool[8] to identify the habitats relevant to the maintenance dredge area.

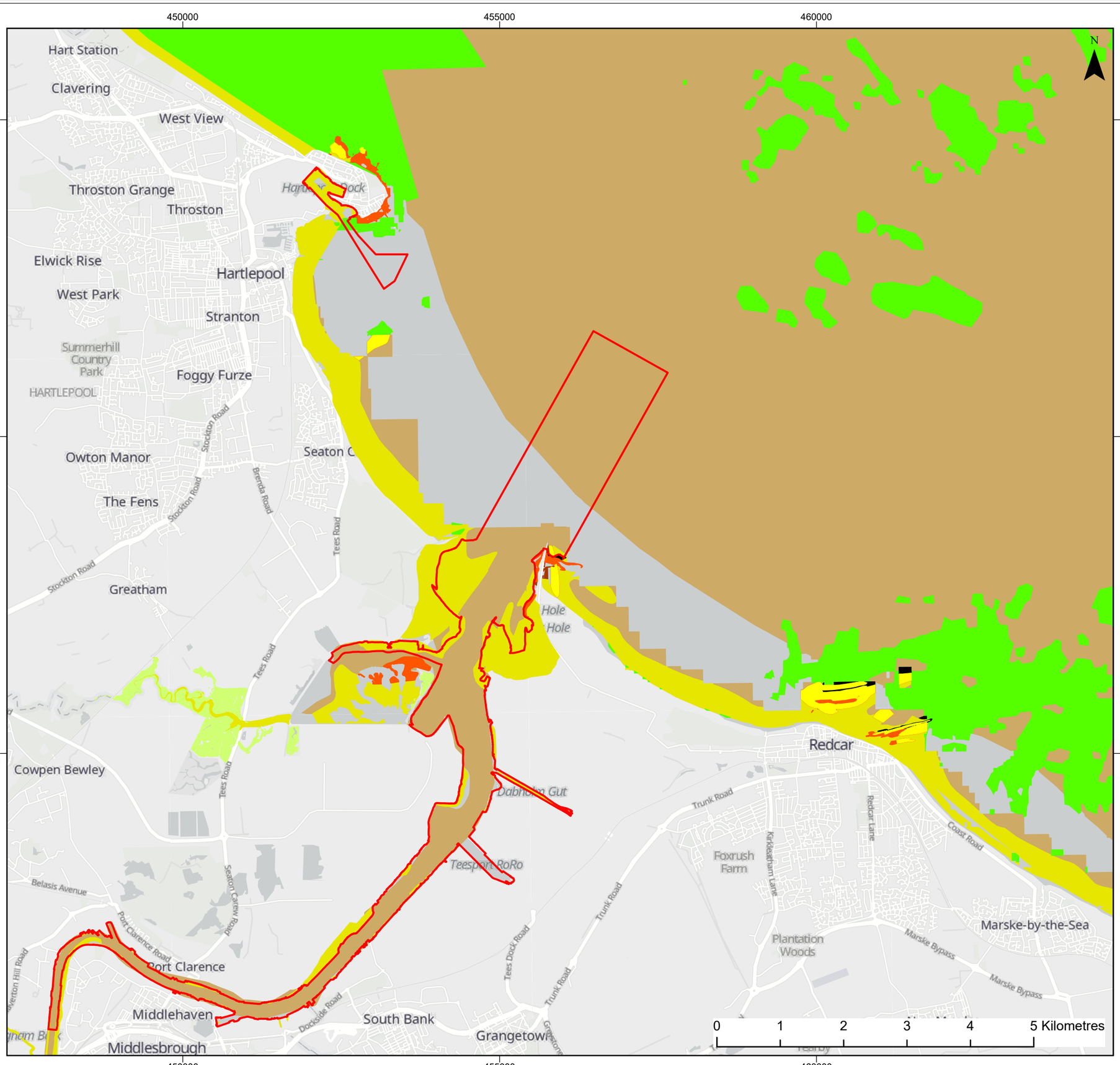
The maintenance dredge area is predominantly made up of lower sensitivity habitats (see **Figure 6-6**). There are sparse areas of gravel & cobbles (intertidal & subtidal coarse sediment A2.1, A5.1) around South Gare at the mouth of the estuary. Rocky shore (Intertidal rock A1) has been identified around South Gare and at Seal Sands and areas of subtidal rocky reef (Infralittoral and Circalittoral rock A3, A4) are located at North Gare and South Gare. Intertidal soft sediment (Sand, Mud & Mixed A2.2, A2.3, A2.4) and subtidal soft sediment (Sand, Mud & Mixed A5.2, A5.3, A5.4) have been assigned to the majority of the maintenance dredge area.

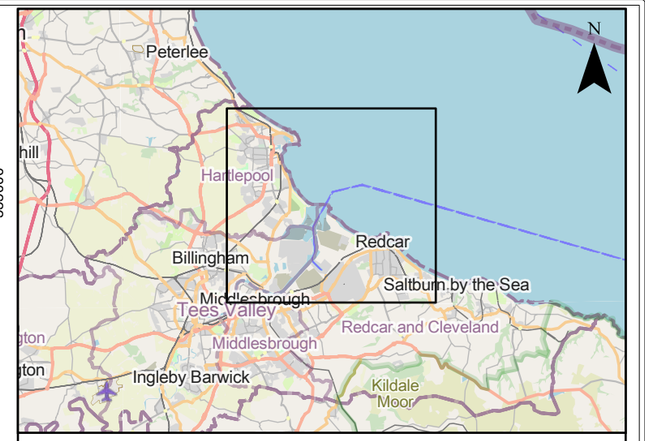
There are records of higher sensitivity habitat within the maintenance dredge area. Small areas of saltmarsh (A2.5) are located within Seal Sands, with saltmarsh also listed in the UK BAP Priority Habitat list (see **Table 6.5** and **Figure 6-7**). Outside of the maintenance dredge area, mussel beds (*Modiolus modiolus, Mytilus edulis* & others A1.22, A2.72, A5.62, A4.24, A3.361) have been identified to the eastern side of South Gare.

Table 6.5 Summary of UK BAP Priority habitats

UK BAP Priority Habitat	Location
Mudflat	Teesmouth includes one of the largest areas of intertidal mudflats on England's north-east coast. These mudflats are an important feeding ground for wading birds, including redshank and dunlin, and also important for harbour seal. Mudflats are also found along the tidal stretches of the River Tees and Greatham Creek.
Coastal and floodplain grazing marsh	Coastal and floodplain grazing marsh covers large tracts of the land east of Billingham and includes extensive areas at Saltholme, Cowpen Marsh and Greenabella Marsh. There is an additional area at Seaton Common and one site south of the river, at Coatham Marsh.
Coastal Sand Dune	Coastal Sand Dune occurs on both sides of the River Tees estuary, at North Gare/Seaton Dunes and South Gare/Coatham Sands.
Saline Lagoon	There are two saline lagoon sites one at the point at which Greatham Creek meets Seal Sands and one within the RSPB Reserve at Saltholme. The aquatic invertebrates occurring in the shallows of these saline lagoons form an important part of the diet of the avocet, and other important water bird species which are associated with this habitat.
Saltmarsh	The largest area of saltmarsh between Lindisfarne National Nature Reserve to the north and the Humber Estuary to the south is found on Greatham Creek. Other small areas of relic saltmarsh are found within some industrial sites and along the tidal stretches of the River Tees.

[8] Magic Map Application





Legend

- Maintained areas

Higher Sensitivity Habitat

- Saltmarsh (A2.5)
- Mussel Beds (A1.22, A2.72, A5.62, A4.24, A3.361)
- Subtidal Kelp Beds (A3.11, A3.21. A3.22, A3.31, A3.32, A5.52)

Lower Sensitivity Habitat

- Gravel & Cobbles (A2.1, A5.1)
- Intertidal Soft Sediment (A2.2, A2.3)
- Subtidal Soft Sediment (A5.2, A5.4)
- Rockyshore (A1)
- Subtidal Rocky Reefs (A3, A4)

Client:	Project:
PD Teesport Limited	Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title:

Water Framework Directive Habitats as shown on MAGiC

Figure: 6.6

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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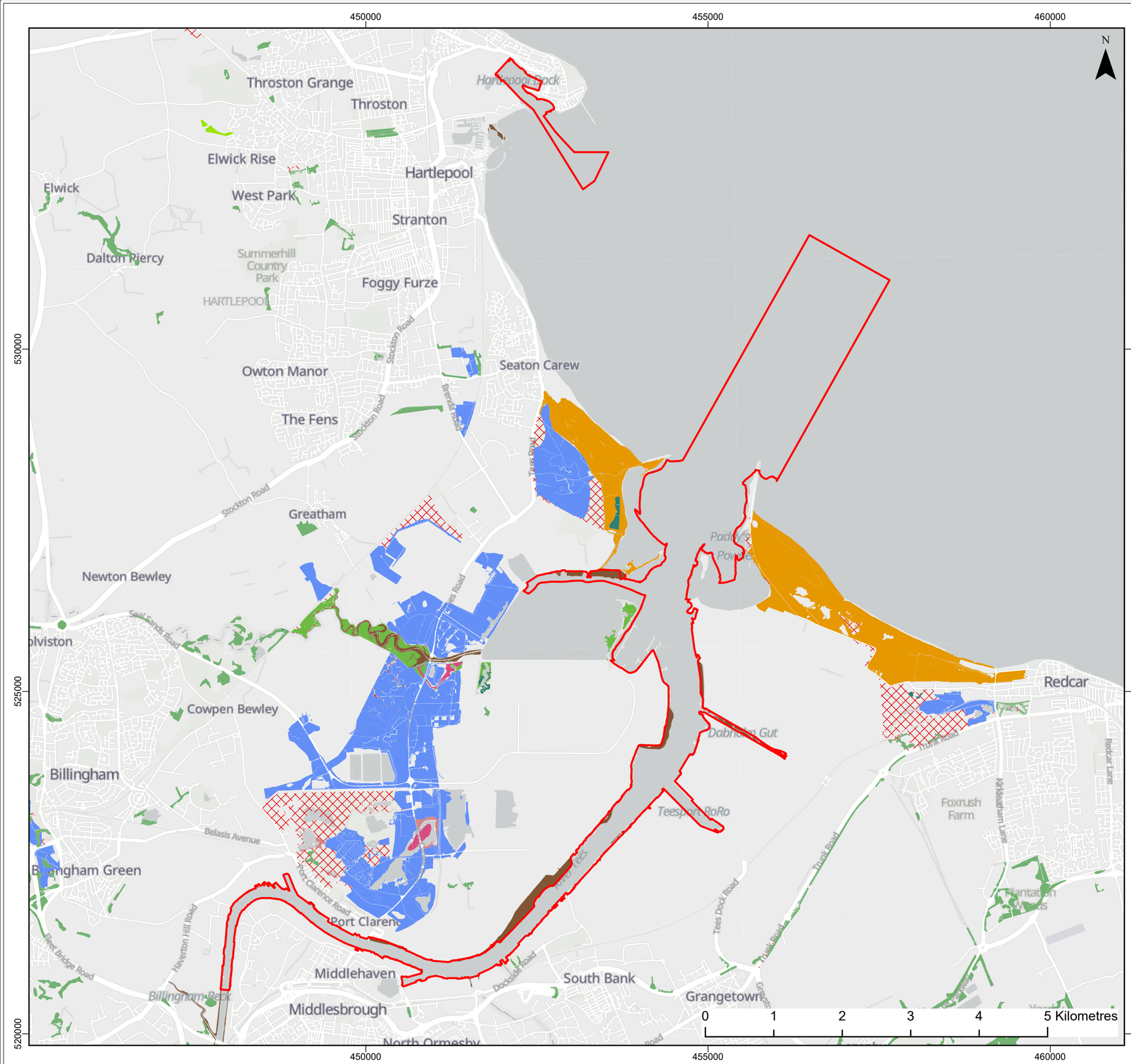

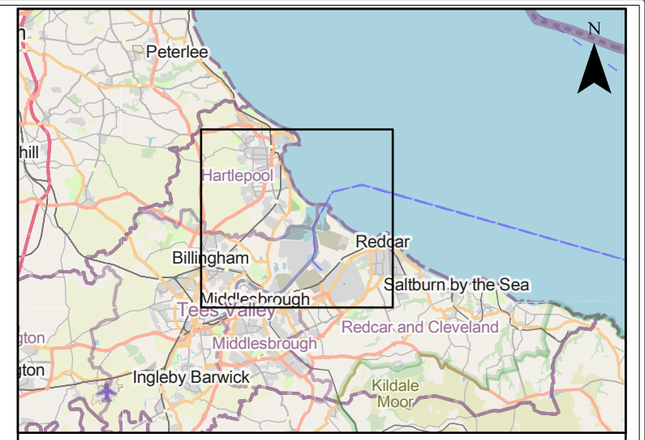

Legend

- Maintained areas

Priority Habitat

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Deciduous woodland
- Lowland fens
- Lowland meadows
- Mudflats
- Reedbeds
- Saline lagoons
- No main habitat but additional habitats present

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Priority Habitats

Figure: 6.7

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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6.3.2 Subtidal ecology

There have been several benthic surveys in the estuary resulting from development proposals. The 2006 benthic survey for the NGCT project confirmed that none of the species present in sediments form the footprint were rare and were considered typical of an estuarine environment. Both low abundance and diversity were recorded. The most abundant species recorded during the 2006 trawl survey was shrimp *Crangon sp*., which was recorded throughout the estuary followed by shore crab *Carcinus maenas* which was more abundant in the middle section of the estuary. Lower abundances of epifauna were recorded at the mouth of the estuary. Of the infaunal species, the most abundant was *Abra alba.*

In 2014, a survey was undertaken for the York Potash Harbour Facilities. The main dominant biotope in the navigation channel was determined as infralittoral sandy mud which is typically dominated by polychaetes and a common species to this biotope is *A. alba*. The outer channel was dominated by two biotopes *Capitella capitata* in enriched sublittoral muddy sediments and *C.capitata* and *Tubificoides sp.,* in reduced salinity infralittoral muddy sediment. These species are characteristic of fine sediments. Again the epifaunal survey identified the most abundant species was shrimp *C. crangon*. *C.maenas* and *A.alba* were also abundant.

Sediment samples were collected as part of the NGCT Environmental reporting in March 2019 within the footprint of the proposed capital dredge. The benthic survey consisted of the collection of 44 subtidal grab samples, including some within the offshore disposal sites in Tees Bay. Sediment sampled were identified as generally mud and sandy mud in the most upstream locations becoming sandier with distance downstream. In terms of biotopes, the most frequently biotope recorded was *Nephtys hombergii* and *Tubificides sp.* in variable salinity infralittoral soft mud.

In terms of grab sample results, the majority of species were deemed to be typical of sublittoral microbenthic communities (Ocean Ecology, 2019) and as has been observed in previous samples, annelid taxa particularly polychaetes, dominated the assemblages. However, two non-native species were identified and two species designated under nature conservation were recorded. In terms of the species of conservation importance these were:

- Ocean quahog *Arctica islandica*. This species was found in very low numbers within only three of the grab samples. Larger numbers were found in the offshore disposal sites.
- Ross worm *Sabellaria spinulosa*. Again this species was identified in very low numbers. Larger numbers were found in the offshore disposal site although confined to Tees Bay C disposal site. The aggregations were not, however, deemed to be representative of biogenic reef habitat.

In terms of the invasive species, *Theora lubrica* was located in one sample and multiple specimens of *Yoldiella* were collected at seven stations

In terms of epibenthic sampling, a large increase in brittlestars (*Ophiura sp*.) was observed in 2019 but all other species were similar including the brown shrimp and shore crab.

6.3.2.1 eDNA Project

As part of the ESG strategy (**see Section 4**), Applied Genomics Ltd. Have been commissioned to undertake eDNA based biodiversity baseline monitoring surveys. This study aims to deliver detailed data on species diversity and distribution with an overall aim of developing an adaptive biosecurity surveillance programme longer term. eDNA is described by Applied Genomics Ltd. as genetic material that is released by organisms living in their environment which could include faeces, urine, skin cells, mucous, gametes for example. This DNA degrades over time but persists in the environment long enough that the presence of organisms in the environment may be detected without being seen or captured (Applied Genomics Ltd, 2022).

Using an eDNA sampler at two locations (Billingham Reach and South Gare; upstream and downstream of the port's operational area), the survey produces targeted biodiversity data. The most recent sample results are summarised in **Table 6.6**. The biodiversity baseline monitoring study is currently ongoing, and further results will be presented in the next baseline document update.

Table 6.6 Summary of eDNA results for 2022, 2023 and 2024

Year	Non native species detected	International Union for Conservation of Nature (ICUN) Red list species detected	Other
2022	Barnacle species *Austrominius modestus* in the downstream sample	Sardine (*Sardina pilchardus*) in the downstream dataset White bream (*Blicca bjoerkna*) in the upstream dataset Roach minnow (*Rutilus rutilus*) in both datasets Common bream (*Abramis brama*) in both datasets	None noted
2023	Chinese mitten crab (*Eriocheir sinensis*) detected in both the River Tees and Tees Estuary samples Australian tubeworm (*Ficopomatus enigmaticus*) was detected in Tees River samples Marine phytoplankton species *Coscinodiscus wailesii* was detected in Tees Estuary samples	European eel (*Anguilla anguilla*)	Numerous commercially important fish species
2024	American mink (*Neovison vison*) was detected (one sequence read) in the Upriver (incoming) sample Pacific saury (*Cololabis saira*) – one sequence read found in the Downriver (outgoing) sample Rainbow trout (*Oncorhynchus mykiss*) - two sequence reads detected in the Upriver (incoming) sample	European eel –detected during the April 2024 sampling period Haddock (*Melanogrammus aeglefinus*) –detected in the Downriver (outgoing) sample	Numerous commercially important fishes were detected in both River and Estuary samples, including: • Whiting (*Merlangius merlangius*) • Atlantic herring (*Clupea harengus*) • Common dab (*Limanda limanda*) • European perch (*Perca fluviatilis*) • Brown trout (*Salmo trutta*) • Blue mussel (*Mytilus edulis)*

6.3.2.2 Crustacean mortality events 2021 and 2022

Dead and dying crabs and lobsters were washed ashore along parts of the North East coast between October and December 2021. The first reports were received by the Environment Agency in October 2021, with impacted crabs covering an area out to approximately 4 to 5 nautical miles. Crabs and lobsters were the only species affected by the incident and where alive, were described as displayed 'twitching' and lethargic behaviour (Department for Environment, Food & Rural Affairs (Defra), 2022).

In response, a joint agency investigation was launched to determine the cause of the incident concluding in March 2022 that no single, consistent causative factor could be identified and specifically that there was no evidence to suggest that the disposal of dredged sediment was responsible. However, a harmful algal bloom was identified as being of significance due to its spatial coverage and timing (Defra, 2022).

In response to the findings of the investigation, several reports have been produced including an independent review commissioned by the North East Fishing Collective using information supplied by the agencies via Freedom of Information requests. The reports disagreed with the findings of the joint agency investigation and identified pyridine concentrations in crab tissue collected in the region as being of concern, thus recommending further investigation particularly into this contaminant and sources of this contaminant. Questions regarding the joint agency's conclusion that a harmful algal bloom was the most likely cause of crab and lobster mortalities were also raised.

The Crustacean Mortality Expert Panel (CMEP) was convened in December 2022 to provide an independent scientific assessment of all the possible causes of the mass crustacean mortality incident using all relevant available data. The panel considered possible causes (including but not limited to the two previously dominant theories) and grouped their consideration into four sections: disease pathology, harmful algal bloom, chemical toxicity, and dredging. The full document is available here: Assessment of unusual crustacean mortality in the north-east of England in 2021 and 2022 - GOV.UK.

With respect to the report section considering maintenance dredging, the report notes the change in dredger operating in the channel offshore during late September and early October 2021 (see **Section 2.3**) but concludes that although larger than normal volumes of sediment were mobilised, maximum possible release of toxic chemicals, including pyridine, was considered to be too small to cause crab mortality. The report also acknowledges that other routine dredging was underway in the Tees Estuary by the port's dredgers and that this was similar to activity conducted every month to keep the port operational following normal regulatory procedures. Considering all available evidence, the panel concluded that it very unlikely that release of any toxic chemical, including pyridine, due to maintenance dredging could have caused the deaths. This conclusion was supported by the broad geographic spread and long duration of crustacean mortality compared to shorter periods of maintenance dredging and disposal events.

6.4 Ornithology

The Wetland Bird Survey (WeBS) is a joint scheme of the British Trust for Ornithology (BTO), the Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds (RSPB) and the Joint Nature Conservation Committee (JNCC). The scheme aims to monitor non-breeding waterbird populations and provides a scientific basis for the conservation of waterbird populations. There are two main types of count data collected as part of the WeBS scheme, Core Counts and Low Tide Counts. Core Counts are monthly surveys focussing on the overwintering period over wetland sites at high tide, when birds are most easily counted at roosts. Low Tide Counts are conducted in large estuaries in at least one winter every six years, with up to four counts being made through the period November to February. The exposed substrate at low tide is divided into small count areas (sectors) enabling the distribution of feeding and roosting birds to be determined in greater detail. Low Tide Counts are designed to complement the Core Counts. **Table 6.7** summaries the readily available information on the BTO website for peak counts taken from the Core Counts.

Table 6.7 Summary of annual peak counts data for Tees Estuary in the 2022/23 WeBS report [9]

Species Name	2021/22	2022/23	Current 5 year Mean
Wigeon	4214	4550	4246
Lapwing	3853	4823	4174
Black-headed Gull	2215	3670	2615
Herring Gull	1109+	1983	1867
Teal	1713	1702	1561
Canada Goose	1514	1208	1335
Greylag Goose	754	1227	1205
Greylag Goose (British/Irish)	754	1227	1205
Golden Plover	1180	1694	1175
Dunlin	678	926	1145
Oystercatcher	900+	965	888
Curlew	613	1415	862
Redshank	756	860	839
Coot	601	575	677
Gadwall	523	412	616
Common Tern	523	595+	559
Mallard	436	381	524
Great Black-backed Gull	204+	401	521
Knot	384	336	515
Shelduck	500	579	484
Sanderling	304+	230+	420
Sandwich Tern	525+	115+	408
Common Gull	199	300+	379
Cormorant	432	235	308
Ringed Plover	274	254	260
Shoveler	209	356	223
Barnacle Goose	254	246	202

[9] *Contains Wetland Bird Survey (WeBS) data from Waterbirds in the UK 2022/23 © copyright and database right 2024. WeBS is a partnership jointly funded by the BTO, RSPB and JNCC, with fieldwork conducted by volunteers and previous support from WWT*

Species Name	2021/22	2022/23	Current 5 year Mean
Barnacle Goose (naturalised)	254	246	202
Kittiwake	121+	174	183
Pink-footed Goose	350	40	182
Grey Plover	206	141	182
Tufted Duck	144	132	165
Turnstone	203+	162+	153
Common Scoter	13+	110	144
Eider (except Shetland)	52+	118+	132
Black-tailed Godwit	238	113	127
Avocet	116	147	108
Bar-tailed Godwit	157	131	97
Pochard	92	92	84
Mute Swan	70	69	66
Red-breasted Merganser	87	73	64
Moorhen	61	43	63
Little Egret	60	55	59
Little Tern	176+	65+	57
Goldeneye	65	47	56
Little Grebe	56	45	54
Grey Heron	61	62	54
Shag	137	25	52
Snipe	50	34	48
Lesser Black-backed Gull	25	25	43
Pintail	56	47	39
Purple Sandpiper	12+	14	37
Great Crested Grebe	43	24+	35
Red-throated Diver	29	24+	19
Whooper Swan	53	20	18
Little Ringed Plover	13	15	11

Species Name	2021/22	2022/23	Current 5 year Mean
Whimbrel	11	2	11
Ruff	20	9	11
Greenshank	20	4	11

Low tide count data is also available online, with the last survey period being 2022- 2023 (Woodward *et al.,* 2024). Within this period the most commonly counted waterbirds were wigeon, teal, Golden plover, redshank, curlew and three species of gull. Information regarding the location and densities of these species is provided in **Table 6.8**. However, the data only indicates counts in Bran Sands and Greatham Creek. Previous low tide counts appear to cover a significantly greater area including counts along the sandy areas outside of the estuary. A summary of the 2018-2019 data is included in **Table 6.9**.

Table 6.8 Monthly peak and average numbers for most commonly counted waterbird species 22/23

Species	Month peak	Month average	Location
Teal	1009	451	Majority of birds counted in Greatham Creek and tributaries, both in intertidal and non tidal areas. Much lesser numbers counted on Bran Sands of which some were counted on the water.
Golden Plover	966	242	Majority located to west of Bran Sands, on the intertidal area. Small number counted in the non tidal area.
Widgeon	773	494	Majority of birds counted in Greatham Creek and tributaries, both in intertidal and non tidal areas. None counted in any other area.
Redshank	585	265	Majority of birds counted in Greatham Creek and tributaries, both in intertidal and non tidal areas. Also reasonable numbers in Bran Sands, spread relatively evenly across the count sectors in the intertidal.
Curlew	3814	138	More sparsely spread across Greatham Creek and tributaries. Split between intertidal and nontidal areas. Relatively low numbers counted in Bran Sands, mostly on the intertidal area.
Common gull	307	99	Located mostly around Bran Sands in both subtidal and intertidal areas.
Black-headed gull	246	76	Equally distributed between Bran Sands and Greatham Creek.
Herring gull	229	102	Mostly focussed around Bran Sands.

Table 6.9 Monthly peak and average numbers for most commonly counted waterbird species 18/19

Species	Month peak	Month average	Location
Herring gull	2257	1328	Predominantly located outside of the Tees estuary, focussed north towards Hartlepool. Many counted in subtidal area.
Golden plover	2254	1064	Generally focussed in two areas – North Gare Sands and Greatham Creek, both non tidal and intertidal areas.
lapwing	2099	819	Mostly focussed in Greatham Creek. Subtidal locations within the estuary and coastal locations to the north of the bay towards Hartlepool
Black-headed gull	1063	479	Predominantly located outside of the Tees estuary, focussed north towards Hartlepool. Many counted in subtidal area.
Redshank	681	391	Similar densities reported in Greatham Creek, Bran Sands and North Gare Sands. Also located in subtidal area within the Tees estuary and in the intertidal area to the north, near Hartlepool

Species	Month peak	Month average	Location
Oyster catcher	540	367	General focus outside of the estuary on sandy intertidal areas either side of the estuary mouth. Small numbers on Bran Sands and on North Gare Sands
Wigeon	303	158	Mostly focussed in Greatham Creek, both non tidal and intertidal areas.

Publications available on the BTO website such as Estuarine Waterbirds at Low Tide (Musgrove *et al.*, 2003) indicate that generally the highest density of waterbirds within the SPA are on Seal Sands, at Greatham Creek and upstream along the River Tees. Other areas of highest use include Coatham Sands. The northern outer beaches, between North Gare and Hartlepool, support lower densities of birds. Cormorants can be widespread, especially around South Gare and Bran Sands and shelducks are mostly concentrated on Seal Sands, with lapwings highly concentrated at Greatham Creek and sanderlings showing a clear reference for the outer parts of the site, especially Coatham Sands. Knot and redshank were both more widespread, although the former showed a tendency towards the outer estuary and the latter towards the inner estuary.

In 2015, Natural England commissioned survey work to verify the predicted pattens of tern usage generated by JNCC's modelling work (ECON Ecological Consultancy Ltd). The results concluded the following:

- Records were concentrated at the mouth of Seaton Channel.
- All other records were equally distributed all the way along the Tees from the barrage to Middlesbrough Dock.

In 2016, this work was repeated for the stretch of the River Tees between Tees Barrage and Seaton Channel to obtain additional information regarding whether existing activities on the river were causing disturbance to terns. The results were similar to those found in 2015 in that common terns were found over the entire length of the River Tees. Sandwich terns were found at Dabholm Gut, Bran Sands and Seaton Channel only. The results regarding disturbance were, however, inconclusive.

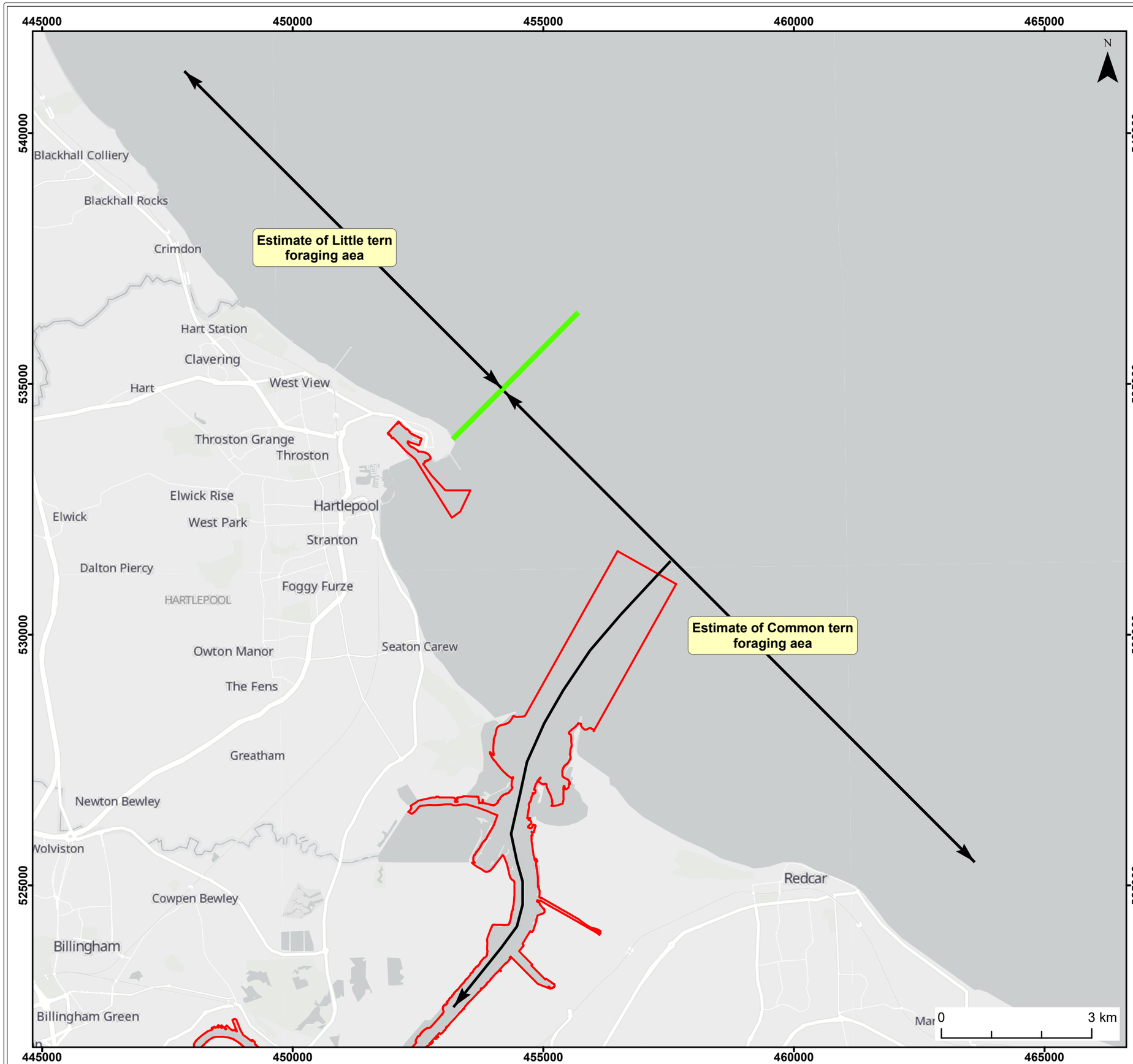
In terms of tern foraging, to inform the Departmental briefing, foraging areas were defined by Natural England and are shown in **Figure 6-8**.

6.4.1.1 Supporting habitats

Seal Sands is the largest area of intertidal mudflat on the east coast of England between Lindisfarne to the north and the Humber Estuary to the south. The flats support high densities of invertebrate prey important for a range of overwintering waterbirds, particularly redshank and shelduck. However, this area has become unfavourable due to the growth of opportunistic macro-algae on the mudflats, which may be limiting food availability for key wader species. Smaller areas of intertidal mudflat occur elsewhere within the estuary, notably at Greatham Creek and North Tees Mudflat. Sandy beaches such as Seaton Sands, North Gare Sands, Bran Sands and Coatham Sands are important feeding and roosting areas for waders, notably red knot and sanderling, with little terns breeding where dunes meet the beach. Seaton Snook, a large sandy spit on the north side of the estuary mouth, is a particularly important roost site for large numbers of gulls, terns and waders as it remains uncovered at high tide. Rocky shores, such as Redcar Rocks and Hartlepool Headland, provide a different range of prey species, including mussel beds, which attach to the hard substrate.

Large areas of grazing marsh are used for feeding and roosting when the adjacent mudflats are inundated at high tide. Saltmarsh provides significant feeding and roosting habitat for many species of waterbird, such as the large areas of sea lavender at Greatham Creek. The freshwater and brackish pools and waterbodies at RSPB Saltholme and surrounding industrial land provides important roosting, breeding and foraging areas for SPA birds, particularly avocet, common tern and ruff.

The Tees channel and shallow coastal waters of Tees Bay and Hartlepool Bay provide foraging habitat for common, little and Sandwich tern. Terns plunge dive to find small fish, such as sandeel, herring, whiting and sprat. Important areas for bird species are shown in **Figure 6-9**.



Legend

Maintained areas

Client:	Project:
PD Teesport Limited	Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Tern Foraging Areas

Figure: 6.8

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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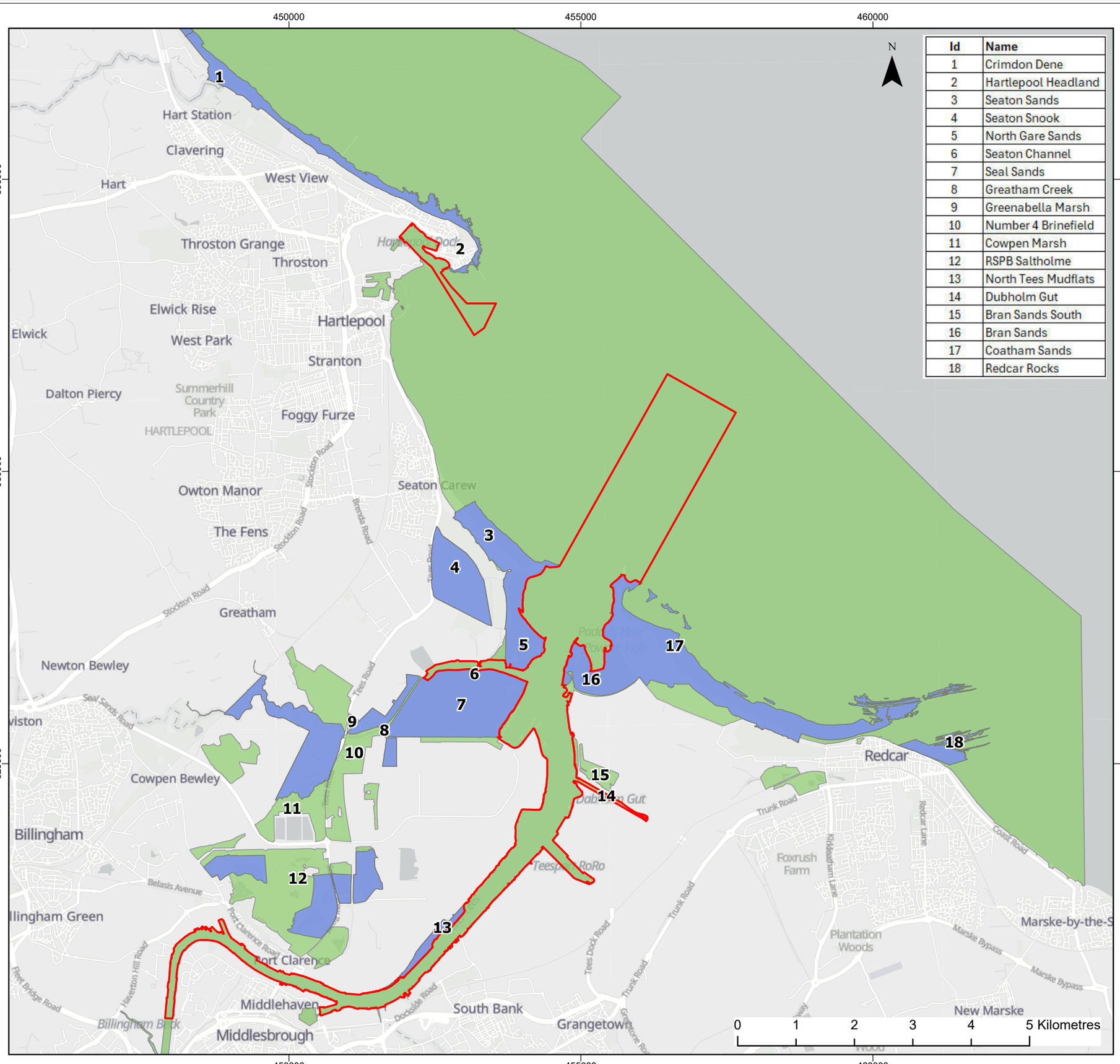
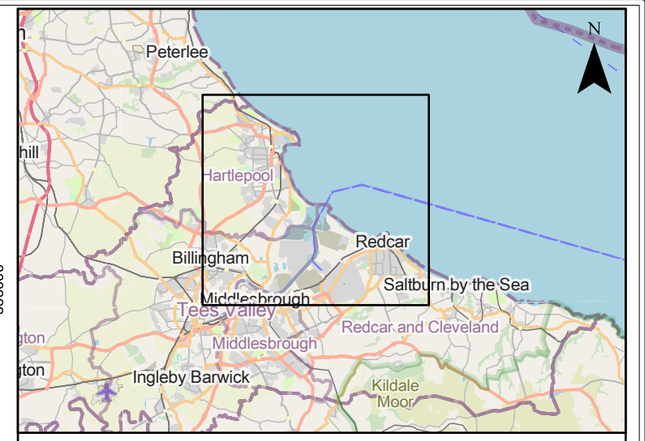


Id	Name
1	Crimdon Dene
2	Hartlepool Headland
3	Seaton Sands
4	Seaton Snook
5	North Gare Sands
6	Seaton Channel
7	Seal Sands
8	Greatham Creek
9	Greenabella Marsh
10	Number 4 Brinefield
11	Cowpen Marsh
12	RSPB Saltholme
13	North Tees Mudflats
14	Dubholm Gut
15	Bran Sands South
16	Bran Sands
17	Coatham Sands
18	Redcar Rocks



Legend

- Maintained areas
- Teesmouth and Cleveland Coast Important Bird Area
- Teesmouth and Cleveland Coast Special Protection Area (SPA)

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Important Bird Areas

Figure: 6.9

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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7 National Site Network Sites

7.1 Teesmouth and Cleveland Coast SPA and Ramsar site

7.1.1 Overview

The SPA was first classified in 1995 for its numbers of European importance of breeding little tern, passage Sandwich tern, wintering red knot and passage common redshank as well as an assemblage of over 20,000 waterbirds, before being updated in 2000. The SPA was extended again in January 2020 to add breeding avocet, breeding common tern and non-breeding ruff as protected features. The extension also includes additional areas of coastal and wetland habitats, the River Tees channel and the shallow coastal waters of Tees Bay.

The Teesmouth and Cleveland Coast SPA protects significant areas of intertidal sand and mudflat, saltmarsh and freshwater grazing marsh, saline lagoons, sand dunes and shingle, rocky shore and shallow coastal waters which support a number of nationally and internationally important bird species. In summer, little tern breed on the sandy beaches within the site and feed out at sea while the common tern, which breed at various locations, feed within the River Tees and associated water bodies and within the wider estuary mouth and bay. In late summer, Sandwich tern aggregate in important numbers at Coatham Sands, Seal Sands, North Gare Sands/Seaton Snook and Bran Sands when on passage.

7.2 Interest features

The SPA is designated for the following features:

- A132 *Recurvirostra avosetta*; Pied avocet (Breeding).
- A143 *Calidris canutus*; Red knot (Non-breeding).
- A151 *Calidris pugnax*; Ruff (Non-breeding).
- A162 *Tringa totanus*; Common redshank (Non-breeding).
- A191 *Sterna sandvicensis*; Sandwich tern (Non-breeding).
- A193 *Sterna hirundo*; Common tern (Breeding).
- A195 *Sterna albifrons*; Little tern (Breeding).
- Waterbird assemblage.

The Teesmouth and Cleveland Coast Ramsar is designated for the following features:

- Knot, *Calidris canutus islandica* – Wintering.
- Redshank, *Tringa totanus* – Passage.
- Sandwich tern, *Thalasseus sandvicensis*, syn. *Sterna sandvicensis* – Passage.
- Waterbird assemblage – Wintering.

A summary of interest features of the SPA and Ramsar and their use of the SPA is provided in **Table 7.1**.

Table 7.1 Summary of interest features and use of the SPA

Species	Usage of the SPA[10]
Pied Avocet	The majority of birds breed on Number 4 Brinefield, mainly on the saline lagoon south of Greatham Creek with small numbers of Greenabella Marsh

[10] *Department brief Natural England (2018) Teesmouth and Cleveland Coast pSPA Departmental Brief.pdf*

Species	Usage of the SPA[10]
Ruff	Ruff occur at shallow water bodies (inland reservoirs) across the site, in particularly on the pools at RSPB Saltholme and North Tees Marshes.
Common tern	Nesting birds are typically concentrated on islands within the various waterbodies at Saltholme with variable and smaller numbers of nests on the saline lagoon in No.4 Brinefield south of Greatham Creek and on rafts at Cowpen Marsh.
Sandwich tern	Highest numbers occur from mid-July to September when adults and juveniles disperse from breeding colonies. The majority roost at Coatham Sands, Seal Sands, North Gare Sands/Seaton Snook and Bran Sands. They feed in shallow inshore waters in and around the estuary mouth
Little tern	Nest on the coast using sand and shingle beaches and spits as well as tiny islets of sand or rock close inshore. Majority of breeding birds are located at Crimdon Dene.
Red knot	Birds feed at low tide on intertidal mudflats, mussel beds and rocky shores on both sites of the estuary., Formerly present in large numbers at Seal Sands however increasingly located outside of the estuary on Coatham Sands, Redcar Rocks and around Hartlepool Headland.
Common redshank	Feed on intertidal mudflats including Seal Sands, North Tees mudflat, Bran Sands and Hartlepool Bay. Additionally at Greatham Creek and intertidal rocky shores at Hartlepool Headland, Redcar and Coatham
Assemblage	Widgeon are found in greatest numbers on the brackish and freshwater pool and adjacent saltmarsh and grasslands around Saltholme and Greatham Creek. Gadwall and Northern Shoveler are found around the North Tees Marshes. Sanderlings are found foraging on wide sandy beaches at Redcar and Coatham Sands with smaller numbers in Hartlepool Bay. Herring gulls congregate on the intertidal and near-shore waters of Hartlepool Bay and on the open coast north of Hartlepool. Black-headed gulls are found in greatest numbers on the intertidal habitats and nearshore waters of Bran Sands, Hartlepool Bay and the open coast north of Hartlepool and the freshwater pools at Saltholme.

7.2.1 Conservation Objectives

The conservation objectives for the Teesmouth and Cleveland Coast SPA are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims, by maintaining or restoring:

1) The extent and distribution of the habitats of the qualifying features.
2) The structure and function of the habitats of the qualifying features.
3) The supporting processes on which the habitats of the qualifying features rely.
4) The populations of each of the qualifying features.
5) The distribution of qualifying features within the site.

7.2.2 Nutrient pressure and water quality

In the Conservation Objectives Supplementary advice for Teesmouth and Cleveland Coast SPA the target for the site related to nutrients is to ‘restore water quality to mean winter dissolved inorganic nitrogen levels where biological indicators of eutrophication (opportunistic macroalgal and phytoplankton blooms) do not affect the integrity of the site and features’.

The assessment undertaken to inform water body status (see **Section 6.2**) DIN, phytoplankton and opportunistic macroalgae ‘weight of evidence’ assessment criteria are currently used to assess the condition for Teesmouth and Cleveland Coast SPA/Ramsar site. Failure to achieve Good Ecological Status for these elements would mean the site is in unfavourable condition in relation to nutrients.

7.2.3 SSSI

The SPA is legally underpinned by the Teesmouth and Cleveland Coast SSSI and is of special interest for the following nationally important features that occur within and are supported by the wider mosaic of coastal and freshwater habitats:

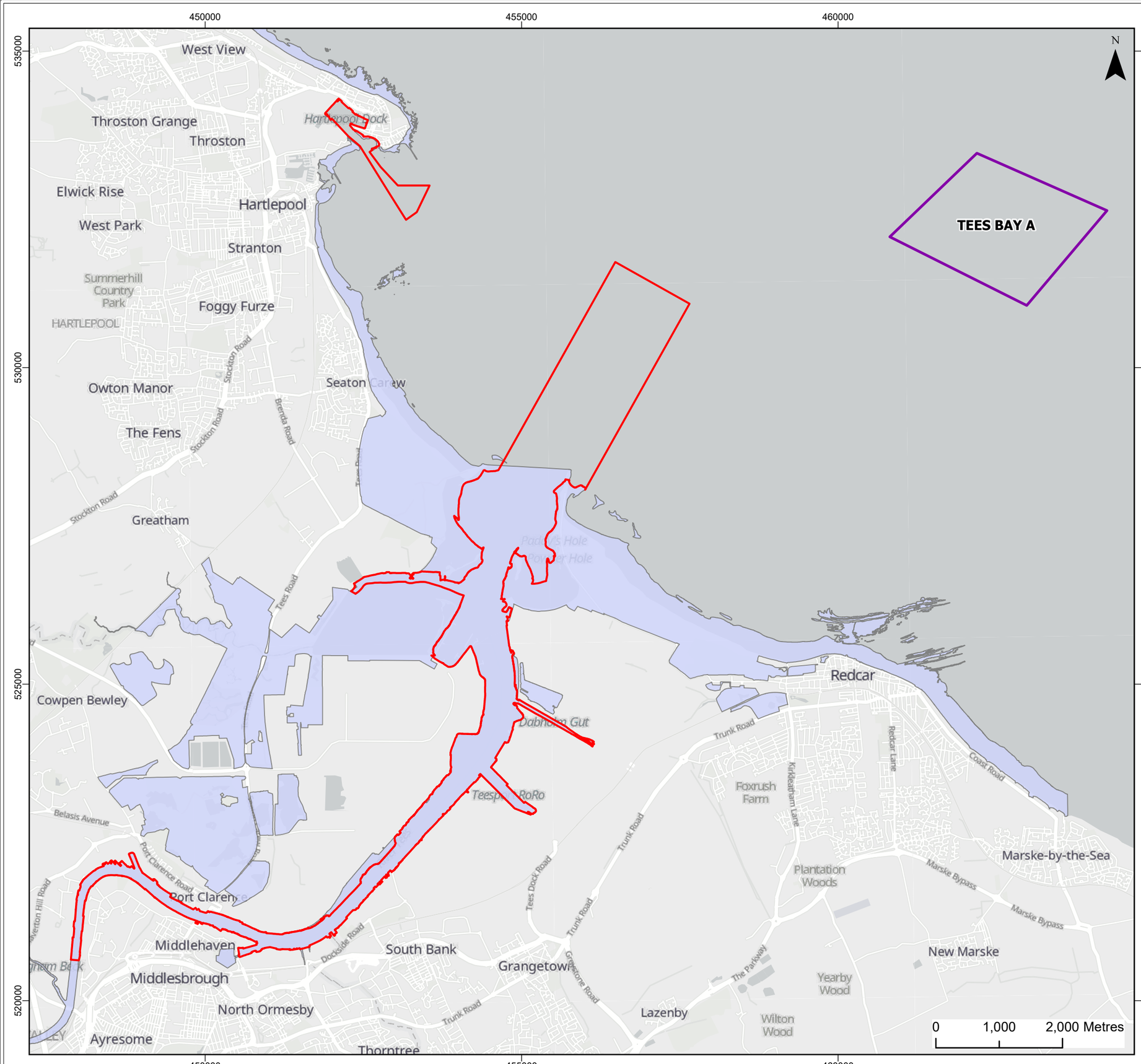
- Jurassic geology;
- Quaternary geology;
- sand dunes;
- saltmarshes;
- breeding harbour seals *Phoca vitulina*;
- breeding avocet *Recurvirostra avosetta*, little tern *Sternula albifrons* and common tern *Sterna hirundo*;
- a diverse assemblage of breeding birds of sand dunes, saltmarsh and lowland open waters and their margins;
- non-breeding shelduck *Tadorna tadorna*, shoveler *Spatula clypeata*, gadwall *Mareca strepera*, ringed plover *Charadrius hiaticula*, knot *Calidris canutus*, ruff *Calidris pugnax*, sanderling *Calidris alba*, purple sandpiper *Calidris maritima*, redshank *Tringa totanus* and Sandwich tern *Thalasseus sandvicensis*;
- an assemblage of more than 20,000 waterbirds during the non-breeding season; and
- a diverse assemblage of invertebrates associated with sand dunes.

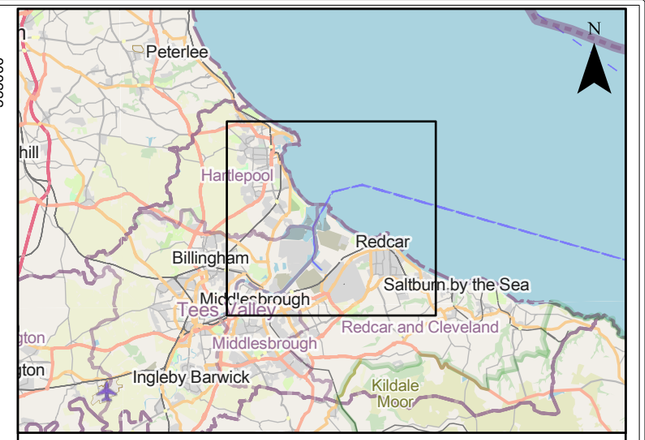
The SSSI includes the whole of the Tees estuary, from its mouth between North Gare and South Gare, upstream to the tidal limits of the Tees and Greatham Creek (see **Figure 7-1**). This contains a large area of intertidal mud and saltmarsh. The coastal strip is predominantly sandy but includes rocky foreshores as well as areas of muddier substrate and an area with peat deposits, including the remains of a submerged forest. There are large dune systems on either side of the estuary mouth: Seaton Dunes to the north of the Tees and Coatham Dunes to the south. Flanking the estuary are extensive areas of wet grassland and freshwater pools, together with smaller patches of a wide range of different habitats including reedbed, saline lagoons and brownfield grassland.

There are 33 units within the SSSI as shown in **Figure 7-2**. The current condition assessment results for each unit in unfavourable condition where the unit is declining, or no change are summarised in **Table 7.2**. All other units are determined to be in unfavourable condition but recovering except for unit 23 which is assessed as being in favourable condition. Pressures listed for this SSSI are as follows[11]:

- Coastal impacts – hydrological management at the coast.
- Pollution – Agricultural sources of water pollution.
- Pollution – Industrial discharges causing water pollution.
- Pollution – Water company discharges causing pollution.

[11] *Site Pressures*





Legend

- Maintained areas
- Teesmouth and Cleveland Coast Site of Special Scientific Interest (SSSI)
- Tees Bay A disposal site

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: Teesmouth and Cleveland Coast SSSI

Figure: 7.1

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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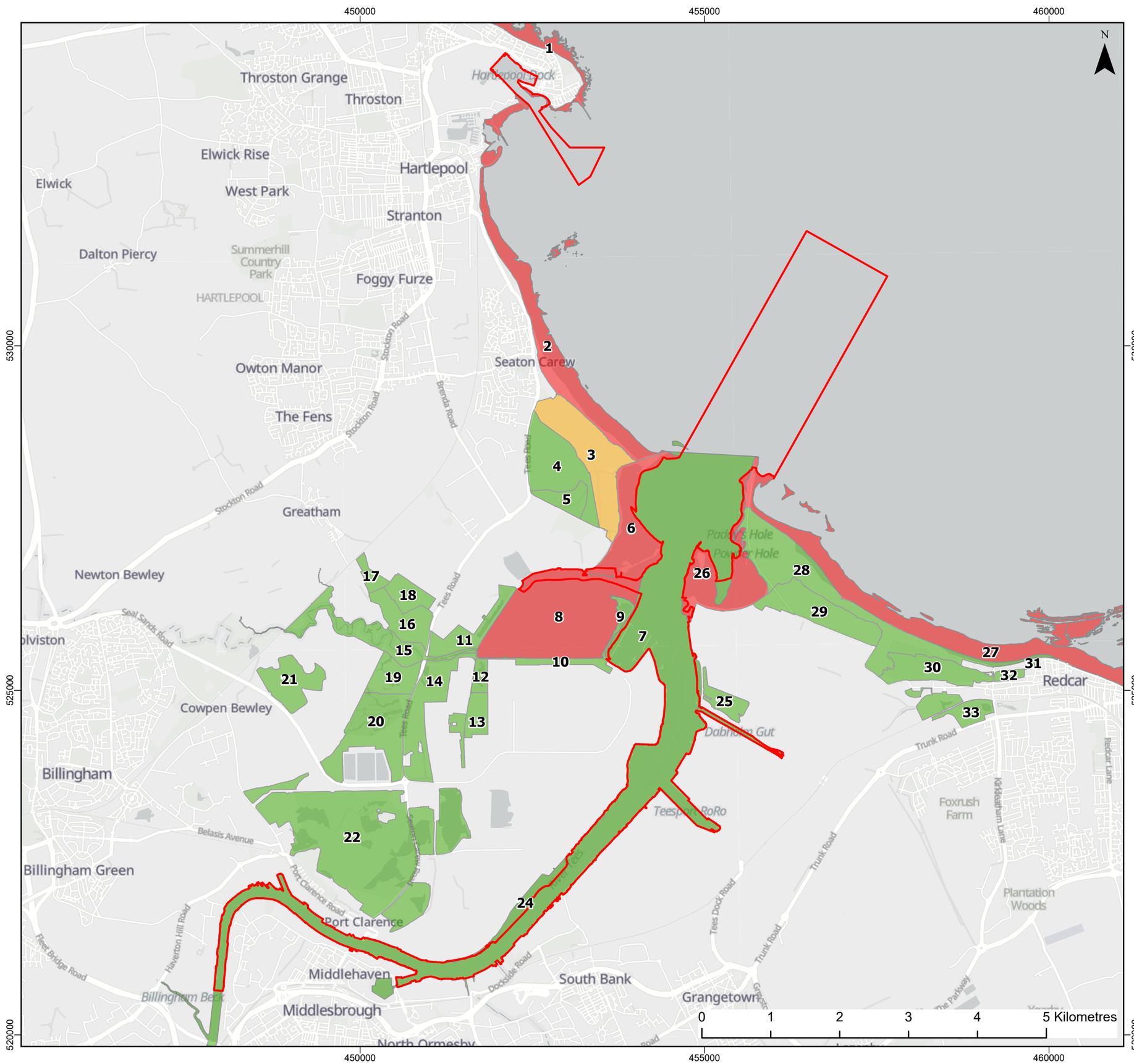

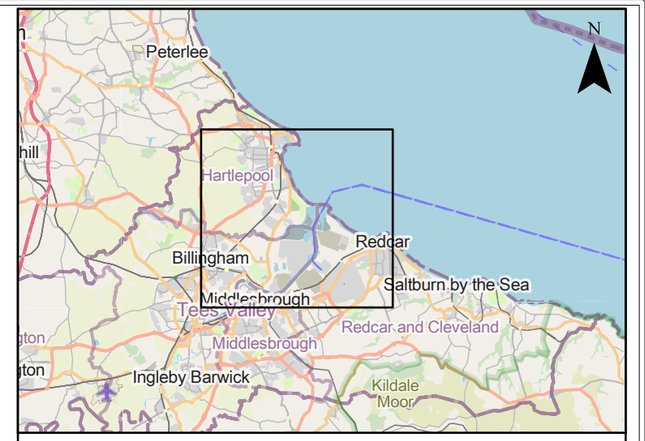

Legend

- Maintained areas
- UNFAVOURABLE RECOVERING
- UNFAVOURABLE NO CHANGE
- UNFAVOURABLE DECLINING

Client: PD Teesport Limited

Project: Tees Maintenance Dredge Protocol (MDP) Baseline Document

Title: SSSI Units and Condition Assessment

Figure: 7.2

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Table 7.2 Summary of units with condition assessed as being unfavourable-declining or unfavourable-no change

Unit number and name	Condition	Habitat	Last assessed and information where available regarding reason for adverse condition
1 – Hartlepool and north Sands	Unfavourable - declining	Littoral sediment	2018
2 – Hartlepool South Pier to North Gare	Unfavourable - declining	Supralittoral sediment	2018
3 - Seaton Dunes	Unfavourable - no change	Supralittoral sediment	2018
6 - North Gare to Seaton Snook	Unfavourable - declining	Supralittoral sediment	2018
8 – Seal Sands	Unfavourable - declining	Littoral sediment	2018. Shelduck: 2011/12 – 2015/16 five year mean peak of 398 individuals. Target is >1,005 individuals. Ringed plover: 2011/12 – 2015/16 five year mean peak 260 individuals. Target is >217 individuals. Knot: 2011/12 – 2015/16 five year mean peak 876 individuals. Target is >3,608 individuals. Redshank: 2011/12 – 2015/16 five year mean peak of 883 individuals. Target is >824 individuals. Sandwich tern: 2011/12 – 2015/16 five year mean peak of 134 individuals. Target is >950 individuals
26 – Bran Sands	Unfavourable - declining	Littoral sediment	2022 Ringed plover: 2011/12 – 2015/16 five year mean peak of 260 individuals. Target is >217 individuals. Knot: 2011/12 – 2015/16 five year mean peak of 876 individuals. Target is >3,608 individuals. Redshank: 2011/12 – 2015/16 five year mean peak of 883 individuals. Target is >824 individuals. Sanderling: 2011/12 – 2015/16 five year mean peak of 242 individuals. Target is >261 individuals Sandwich tern: 2011/12 – 2015/16 five year mean peak of 134 individuals. Target is >950 individuals. Reason for adverse condition: Coastal squeeze
27 - South Gare to Marske	Unfavourable – declining	Supralittoral sediment	2018

7.3 Assessment

Natural England has developed 'Advice on Operations[12]' for the SPA including recommendations regarding specific interest features and their supporting habitats. For the assessment, this advice has been used, alongside the information presented in **Sections 1-6**. The '*Ports and harbours (maintenance) – maintenance dredging and maintenance dredging disposal*' activities were selected to inform the assessment.

The sensitivity categories, as detailed in the 'Advice on Operations, are summarised in **Table 7.3**. Note 'not sensitive' and 'not relevant' have been combined for ease of presentation.

[12] *Designated Sites View*

Table 7.3 Sensitivity colour coding

Colour code	Sensitivity category description (taken from Natural England Advice for Operations)
	Sensitive: The evidence base suggests the feature is sensitive to the pressure at the benchmark. This activity-pressure-feature combination should therefore be taken to further assessment.
	Insufficient evidence to assess - The evidence base is not considered to be developed enough for assessments to be made of sensitivity at the pressure benchmark. This activity-pressure-feature combination should therefore be taken to further assessment. The best available evidence, relevant to the activity in question, at the time of application, should be sourced and considered in any further assessment.
	Not assessed - A sensitivity assessment has not been made for this feature to this pressure. However, this activity-pressure-feature combination should not be precluded from consideration. The best available evidence, relevant to the activity in question, at the time of application, should be sourced and considered in any further assessment.
	Not sensitive - The evidence base suggests the feature is not sensitive to the pressure at the benchmark. However, this activity-pressure-feature combination should not be precluded from consideration (e.g. thought needs to be given to activity specific variations in pressure intensity and exposure, in-combination and indirect effects). The best available evidence, relevant to the activity in question, at the time of application, should be sourced and considered in any further assessment.

Table 7.4 Summary of assessment against features and supporting habitats

Pressure	Qualifying feature/supporting habitat sensitivity															Assessment
	Avocet, breeding	Common tern, breeding	Knot, non-breeding	Little tern, breeding	Redshank, non-breeding	Ruff, non-breeding	Sandwich tern, non-breeding	Coastal lagoon	Freshwater and coastal grazing marsh	Salicornia and other annuals colonising mud and sand	**Atlantic salt meadows**	**Intertidal rock**	**Intertidal biogenic reef mussel beds**	**Intertidal (mixed sediments/mud/muddy sand)**	**Water column**	
Abrasion/disturbance of substrate on surface of seabed																No effect on bird species as they are not considered sensitive to this pressure. Regarding supporting habitats, dredging is not required in the areas considered to be sensitive to this pressure therefore there is no pathway for effect on these habitats. With respect to disposal activities, baseline information indicates that dispersal occurs quickly and effects are localised to the disposal site. There is therefore no pathway for effect.
Habitat structure change – removal of substratum (extraction)																No effect on bird species as they are not considered sensitive to this pressure. The effect on water column is associated with release of sediments into the water – this is assessed in changes to suspended solids concentrations pressure below. Intertidal habitats in the Tees estuary are sensitive to change in habitat structure due to the risk of destabilisation of side slopes towards the seaward part of the approach channel. To reduce the potential for this to occur, the method of dredging has been adapted to maintain two trenches either

Pressure	Qualifying feature/supporting habitat sensitivity															Assessment
	Avocet, breeding	Common tern, breeding	Knot, non-breeding	Little tern, breeding	Redshank, non-breeding	Ruff, non-breeding	Sandwich tern, non-breeding	Coastal lagoon	Freshwater and coastal grazing marsh	Salicornia and other annuals colonising mud and sand	**Atlantic salt meadows**	**Intertidal rock**	**Intertidal biogenic reef mussel beds**	**Intertidal (mixed sediments/mud/muddy sand)**	**Water column**	
																side of the navigation channel at the toe of the side slopes to help trap material. It is from these areas, rather than the slopes, that material is removed as part of the maintenance activities. This limits the potential for direct impact on the adjacent intertidal and therefore the habitat features of the SPA. Dredging is not required directly within these habitats. With respect to sea disposal, no extraction is required.
Penetration and or disturbance of the substrate below the surface of the seabed																No effect on bird species as they are not considered sensitive to this pressure. There would be no dredging or disposal activities where supporting habitat features of the SPA are located. Therefore, there will be no removal of seabed in these habitats and there would be no effect on these supporting features.
Smothering and siltation rate changes (heavy)																Maintenance dredging in the Tees has been undertaken at a relatively steady rate over the past decade in the same manner by similar plant. As such the release of material and changes to morphology will have been at similar rates over this time period. The maintenance dredging in the estuary is therefore very much part of the existing overall sediment regime. Seaton Channel is the most sensitive location in that it forms the main pathway for sediment transport to Seal Sands, an
Smothering and siltation rate changes (light)																

Pressure	Qualifying feature/supporting habitat sensitivity															Assessment
	Avocet, breeding	Common tern, breeding	Knot, non-breeding	Little tern, breeding	Redshank, non-breeding	Ruff, non-breeding	Sandwich tern, non-breeding	Coastal lagoon	Freshwater and coastal grazing marsh	Salicornia and other annuals colonising mud and sand	**Atlantic salt meadows**	**Intertidal rock**	**Intertidal biogenic reef mussel beds**	**Intertidal (mixed sediments/mud/muddy sand)**	**Water column**	
																area currently deemed in unfavourable condition (SSSI assessment). The reason for unfavourable is however, associated with the development of algal mats due to poor water quality and agricultural run off is listed as a potential pressure impacting on Seal Sands. Additionally, maintenance dredging in this location is relatively infrequent and small in terms of volumes. It is therefore unlikely that maintenance dredging is having an impact. With respect to disposal activities, baseline information indicates that dispersal occurs quickly and effects are localised to the disposal site. There is therefore no pathway for effect.
Changes in suspended solids (water clarity)																Changes to background turbidity could impact on food resources such as the sandeels used by little tern. However, due to the predominant sediment types in the areas where these feed (i.e. sandy sediments), re-suspension of sediment in the water column is likely to be limited as settlement would occur rapidly. With respect to disposal activities, baseline information indicates that dispersal occurs quickly and effects are localised to the disposal site. There is therefore no pathway for effect.
Barrier to species movement																

7.4 Conclusion

As indicated by Natural England's advice for operations, maintenance dredging and disposal could affect the Teesmouth and Cleveland SPA/Ramsar via the following pathways;

- Abrasion/disturbance of substrate on surface of seabed;
- Habitat structure change – removal of substratum (extraction);
- Penetration and or disturbance of the substrate below the surface of the seabed;
- Smothering and siltation rate changes (heavy);
- Smothering and siltation rate changes (light);
- Changes in suspended solids (water clarity); and
- Barrier to species movement.

Due to the frequency of the activity (near continuous), dredging the maintained areas can be considered part of the baseline. This is confirmed by the information presented in **Table 7.4**. Additionally, studies undertaken to inform various projects do not indicate that disposal operations at the Tees Bay A disposal site would affect the SPA/Ramsar as sediment plumes dilute quickly, within close proximity to disposal site boundary. It is therefore concluded that the existing maintenance dredging and disposal activity does not appear to be having, or has historically, had an effect on the Teesmouth and Cleveland Coast SPA/Ramsar.

If there is a significant change in maintenance dredging practices in terms of volumes removed and or geographical areas where dredging is required, a review of the baseline document should be undertaken.

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Appendix A – MMO Compliance Report (2024)

Marine Management Organisation

Marine Licence Compliance Report

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1. Licence details

Licence holder name	PD TEESPORT LIMITED

Marine Licence reference number	L/2015/00427/7
Compliance reference number	MLC/2015/00484

Version	7
Licence start date	1st January 2016
Licence end date	31st December 2025
Date of original issue	30th December 2015

2. Project overview

Project title
Tees and Hartlepool Maintenance Dredge Disposal.

Project description
Renewal of the current maintenance dredge disposal licence (L/2012/00366) which has been on-going over many years. This application is for a 10 year maintenance dredging disposal licence. The updated Tees Maintenance Dredging Protocol (MDP) Baseline Document. is attached below and is referred to throughout the application.

3. Licensed activities

Activity type
Deposit of any substance or object - Disposal of dredged material
Deposit of any substance or object - Disposal of dredged material

4. Inspection details

Inspection no	7
Inspection type	Site
Inspection start date and time	4th December 2024 08:30:00
Inspection end date and time	4th December 2024 12:00:00

5. Licence and methodology

	Compliance	Note
Licence held on site	Compliant	The most recent version of the licence was held on site.

Methodology	Compliant	The methodology adopted is consistent with that authorised under the terms of the licence.
Unlicensed activity	Compliant	No unlicensed activity identified.

6. Condition compliance

Condition no.	Licence condition description	Condition Compliance	Condition Status	Corrective action	Comments
5.1.1	The licence holder must notify the MMO prior to the commencement of the first instance of any licensed activity. This notice must be received by the MMO no less than five working days before the commencement of that licensed activity.	Compliant	Discharged	N/a	Return completed. Condition discharged.
5.1.2	Where provisions under section 71(5) of the 2009 Act apply, all conditions attached to this licence apply to any person who for the time being owns, occupies or enjoys any use of the licensed activities for which this licence has been granted.	Compliant	Ongoing	N/a	Dredger owned and operated by PD Ports. Dredger crew and vessel Captain well aware of conditions.
5.1.3	The licence holder must notify the MMO in writing of any agents, contractors or sub-contractors that will carry on any licensed activity listed in section 4 of this licence on behalf of the licence holder. Such notification must be received by the MMO no less than 24 hours before the commencement of the licensed activity.The licence holder must ensure that a copy of this licence and any subsequent revisions or amendments has been provided to, read and understood by any agents, contractors or sub-contractors that will carry on any licensed activity listed in section 4 of this licence on behalf of the licence holder.	Compliant	Ongoing	N/a	No contractors currently operating under this licence. PD Ports are conducting the work with their own vessels.
5.1.4	The licence holder must notify the MMO in writing of any vessel being used to carry on any licensed activity listed in section 4 of this licence on behalf of the licence holder. Such notification must be received by the MMO no less than 24 hours before the commencement of the licensed activity. Notification must include the master's name, vessel type, vessel IMO number and vessel owner or operating company.The licence holder must ensure that a copy of this licence and any subsequent revisions or amendments	Compliant	Ongoing	N/a	Returns completed of all current and temporary vessels involved in dredging campaigns. Hoertness and Emerald Duchess currently being used to conduct dredging. MMO made aware of new vessel

Condition no.	Licence condition description	Condition Compliance	Condition Status	Corrective action	Comments
	has been read and understood by the masters of any vessel being used to carry on any licensed activity listed in section 4 of this licence, and that a copy of this licence is held on board any such vessel.				Emerald Duchess operating under this licence.
5.1.5	Should the licence holder become aware that any of the information on which the granting of this licence was based has changed or is likely to change, they must notify the MMO at the earliest opportunity. Failure to do so may render this licence invalid and may lead to enforcement action.	Compliant	Ongoing	N/a	Licence holder aware of the condition.
5.1.6	Where a licensed activity comprises dredging or the disposal of dredged material, the total quantity of material authorised to be dredged or disposed of in any given time period shall be as set out for that licensed activity in section 4 of this licence.For each time period, the actual quantity dredged or disposed of shall be calculated by adding the quantity of material dredged or disposed of during that time period under this version of this licence to that dredged or disposed of under any previous version of this licence that was valid during that time period.	Compliant	Ongoing	N/a	OSPAR returns submitted for quantities dredged under this licence.
5.2.1	The licence holder must report any oil, fuel or chemical spill within the marine environment to the MMO Marine Pollution Response Team within 12 hours.Within office hours: 0300 200 2024.Outside office hours: 07770 977 825.At all times if other numbers are unavailable: 0845 051 8486.dispersants@marinemanagement.org.uk	Compliant	Ongoing	N/a	Licence holder is aware of condition. Licence holder has policies and procedures in place to tackle a pollution incident. Vessel crew also familiar with what to do during a small spillage such as a spillage on deck or a large spillage resulting from something such as a collision at sea. Spill kits and

Condition no.	Licence condition description	Condition Compliance	Condition Status	Corrective action	Comments
					absorbent pads present around the vessel.
5.2.2	Any man-made material must be separated from the dredged material and disposed of to land.	Compliant	Ongoing	N/a	Drag head has a grid set up over the drag head mouth. Causes man made material to become trapped in the grid. Man made material seen on deck separated following each dredging operation.
5.2.3	A regime of future sediment sampling is undertaken by PD Teesport, of at least three yearly intervals, which must be agreed in advance with the MMO. Samples must be collected, analysed and the report of their notification signed off prior to dredging in the fourth and subsequently the seventh and tenth year of this licence.	Compliant	Ongoing	N/a	Sediment sampling submitted by licence holder.
5.2.4	During the course of disposal, material must be distributed evenly over the disposal site Tees Bay 1, TY160.	Compliant	Ongoing	N/a	Disposal was conducted at Tees Bay A. Site is split into months of the year. Vessel deposits material within one of 12 boxes spread evenly across the site depending on month of disposal. Boxes and months displayed clearly on vessels plotter.
5.2.5	No more than 2,889,700 tonnes wet weight is disposed of at Tees Bay A (TY160) per annum.	Compliant	Ongoing	N/a	OSPAR returns submitted for 2023 indicate that total dredge quantity is well within allowable limits.

Condition no.	Licence condition description	Condition Compliance	Condition Status	Corrective action	Comments
5.2.6	The licence holder must inform the MMO of the location and quantities of material disposed of each month under this Licence by 31 January each year for the months August to January inclusive, and by 31 July each year for the months February to July inclusive.	Compliant	Ongoing	N/a	OSPAR returns submitted.
5.2.7	Material should be excluded from disposal at sea from the following wharfs/frontages, named on the previous licence and designated as:Cochrane's/Tees wharf;Normanby Wharf Graving Dock;Tees Offshore Base;Teesport Commerce Wharf (TPC) Dry Dock;Wharf Britannia; andEnterprise Zone.	Compliant	Ongoing	N/a	These sites are not currently being dredged by PD Ports. They are all vessel berths. Dredger operates exclusively in the main navigational channel. Excluded areas shown on new vessel's, Emerald Duchess, plotter.
5.2.8	Bunding and/or storage facilities must contain and prevent the release of fuel, oils, and chemicals associated with plant, refuelling and construction equipment, into the marine environment. Secondary containment must be used with a capacity of no less than 110% of the container's storage capacity.	Compliant	Ongoing	N/a	Spill kits and pollution kit is available on the vessel and on land disposal/ storage is bunded and has crash barriers surrounding them to prevent incidents with machinery operating in the quay. Vessel has bunded storage for any oil/ contaminants on board.
5.2.9	If disposal of more than 1 million tonnes wet weight is required at Tees Bay A (TY160) in 2022, 2023 or 2024, then additional sediment sampling requirements must be agreed with the MMO. Agreed sample results must be submitted to and approval given in writing by the MMO	Compliant	Ongoing	N/a	Total dredged quantity so far for 2024 was 618511.13 wet tonnes up until the 31st July. The MMO granted approval for 1.5 million tonnes

Condition no.	Licence condition description	Condition Compliance	Condition Status	Corrective action	Comments
	prior to disposal of material above 1 million tonnes wet weight per annum.				to be disposed of at Tees Bay A following additional sampling plan.

8. Outcome

Compliance assessment rating	Compliant
Condition status	Ongoing

Inspection completed by	Mr Ryan Brough
Date completed	6th December 2024

Appendix B - Dredging volume by year and location in m^3

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Reach 1	5911	127827	42384	70856	12361	27075	42701	49701	24159	40237	19066	73544	25674	48,268	62094	1500	33972	2165	16509	21429	19122	59178	3737	0
Reach 2	21,768	122381	16470	73210	11649	12982	26028	19805	60118	32817	371	9814	8863	15,894	29830	61722	25133	22508	11379	11307	30825	14532	16802	25156
Reach 3	0	1366	4176	3205	412	412	1925	735	1772	48532	0	37429	0	52,857	64998	65468	33698	8501	1693	8418	18694	30922	25982	3728
Reach 4	3131	1666	127	4468	676	282	1514	0	274	6056	11386	1500	2996	12,504	11770	12884	8771	1879	2605	3699	0	0	32964	4391
Reach 5	4621	1634	2751	3815	5997	1339	764	0	1336	4745	13496	2541	15018	5,370	471	951	0	0	3270	5622	219	361	1584	2151
Reach 6	1625	5282	24645	4859	23640	12092	3088	18906	7037	17009	41303	21755	26210	3,630	10534	18383	8242	8624	10618	18762	6300	3995	27944	34401
Reach 7	51303	4804	10765	3297	1243	2642	9841	55084	19322	43157	12502	10160	19746	42,200	61866	25041	3339	0	0	2080	28827	29813	12927	16749
Reach 8	37075	76297	72261	39251	30172	56926	96160	82531	140839	68357	27102	64468	131948	93,188	111145	37485	50317	44138	44965	26931	65192	107498	65027	82287
Reach 9	256,158	252715	279054	330835	321316	347365	332679	349982	174009	266187	336050	278883	286441	124,821	230316	143677	202051	121796	258315	136566	220035	133262	219604	136276
Reach 10	174248	118613	171950	137022	161349	168733	143089	178819	186336	317961	117635	211799	221176	201,953	106326	51239	44053	36072	21132	5229	37904	147299	67827	46087
Reach 11	112437	296471	85385	121807	113304	230099	97682	92427	163910	225143	159529	110787	43032	110,777	36893	64146	44546	129283	12404	2702	62704	76747	84219	60793
Reach 12	34747	28437	28156	48707	21307	28262	39441	23548	27937	12133	38877	35415	7662	5,954	4898	11168	4796	4471	10170	575	451	15444	52167	700
Tees Berths	148837	115219	141880	303869	164664	316696	254458	272520	215702	162053	195482	159067	205141	246,486	141160	173396	111,221	92351	75427	55129	33818	81733	93979	80851
Hartlepool	119847	157329	146457	114104	89811	137606	121605	132041	125032	170170	154025	80410	186229	99,068	79818	92781	79,936	110448	39943	52907	82146	40680	92529	72989
Seaton Channel	0	10900	0	0	0	0	22279	102463	111424	42110	21060	0	49598	74,652	0	0	71,803	41712	15951	0	0	0	8044	25528
Other	0	245	9809	0	0	312	23366	34605	54610	46725	461	0	0	0	23972	58842	0	53880	17183	0	0	0	0	0
Total	**971708**	**1321186**	**1036270**	**1259305**	**957901**	**1342823**	**1216620**	**1413167**	**1313817**	**1503392**	**1148345**	**1097572**	**1229734**	**1137622**	**976091**	**818683**	**721878**	**677828**	**541564**	**351356**	**606237**	**741464**	**805336**	**592087**

Appendix C – Year 3 sample summary

NGCT samples

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)
Arsenic	6.9	33.3	Yes (29)	No (0)
Cadmium	0.04	0.59	Yes (3)	No (0)
Chromium	5.4	52.2	Yes (11)	No (0)
Copper	7.8	74.3	Yes (11)	No (0)
Mercury	0.05	0.6	Yes (21)	No (0)
Nickel	5.2	35.6	Yes (26)	No (0)
Lead	13.2	135	Yes (29)	No (0)
Zinc	35.2	254	Yes (22)	No (0)
DBT	<0.005	0.020	No (0)	No (0)
TBT	<0.005	0.014	No (0)	No (0)
Acenaphthene	0.04	0.88	No (0)	-
Acenaphthylene	0.02	3.78	Yes (1)	-
Anthracene	0.05	1.20	Yes (1)	-
Benzo(a)anthracene	0.07	1.15	Yes (1)	-
Benzo(a)pyrene	0.06	1.10	Yes (1)	-
Benzo(b)fluoranthene	0.04	0.96	No (0)	-
Benzo(e)pyrene	0.09	0.85	No (0)	-
Benzo(ghi)perylene	0.08	0.81	No (0)	-
Benzo(k)fluoranthene	0.02	0.52	No (0)	-
C1 Naphthalene	2.14	7.83	Yes (36)	-
C1 Phenanthrene	0.65	4.55	Yes (33)	-
C2 Naphthalene	1.42	5.46	Yes (36)	-
C3 Naphthalene	1.05	3.35	Yes (36)	-
Chrysene	0.10	1.05	Yes (2)	-
Dibenzo(ah)anthracene	0.01	0.16	No (0)	-
Fluoranthene	0.10	2.20	Yes (19)	-
Fluorene	0.10	3.00	Yes (1)	-
Indeno(1,2,3-c,d)pyrene	0.02	0.65	No (0)	-
Naphthalene	0.70	1.94	Yes (33)	-
Perylene	0.006	0.23	No (0)	-
Phenanthrene	0.54	5.83	Yes (33)	-
Pyrene	0.13	2.54	Yes (17)	-
PCB – sum of ICES7	0.004	0.006	Yes (1)	-

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)
PCB – sum of ICES25	0.008	0.014	Yes (1)	No (0)
Alpha-hexachlorocyclohexane	<0.0001	0.00028	-	-
Beta-hexachlorocyclohexane	<0.0001	0.00014	-	-
Gamma-hexachlorocyclohexane	<0.0001	0.00134	-	-
Dieldrin	<0.0001	0.00059	No (0)	-
Hexachlorobenzene	0.00018	0.00868	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethane (PPTDE)	0.00012	0.00204	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	0.00020	0.00106	-	-
Dichlorodiphenyltrichloroethane (PPDDT)	<0.0001	0.00389	Yes (2)	-
BDE17	<0.00002	0.000926	-	-
BDE28	<0.00002	0.000701	-	-
BDE47	0.000104	0.00417	-	-
BDE66	<0.00002	0.000707	-	-
BDE85	<0.00002	0.000278	-	-
BDE99	0.0000988	0.00493	-	-
BDE100	0.0000202	0.000598	-	-
BDE138	<0.00002	<0.00002	-	-
BDE153	<0.00002	0.000968	-	-
BDE154	<0.00002	0.000466	-	-
BDE183	<0.00002	0.000841	-	-
BDE209	0.00381	0.407	-	-

Royal HaskoningDHV

10 upstream samples

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
Arsenic	14.2	26.3	Yes (4)	No (0)	Yes (10)	No (0)
Cadmium	0.46	2.61	Yes (10)	No (0)	No (7)	No (0)
Chromium	50.7	138	Yes (10)	No (0)	No (9)	No (0)
Copper	53.6	182	Yes (10)	No (0)	Yes (10)	Yes (4)
Mercury	0.47	2.06	Yes (10)	No (0)	Yes (10)	Yes (5)
Nickel	19.2	38.4	Yes (9)	No (0)	No (0)	No (0)
Lead	120	385	Yes (10)	No (0)	Yes (10)	Yes (10)
Zinc	167	680	Yes (10)	No (0)	Yes (10)	Yes (6)
DBT	0.018	0.039	No (0)	No (0)	No (0)	No (0)
TBT	0.021	0.101	No (0)	No (0)	No (0)	No (0)
Acenaphthene	0.379	1.84	Yes (10)	-	Yes (10)	Yes (10)
Acenaphthylene	0.239	0.746	Yes (10)	-	Yes (10)	Yes (10)
Anthracene	0.452	2.04	Yes (10)	-	Yes (10)	Yes (10)
Benzo(a)anthracene	0.997	5.44	Yes (10)	-	Yes (10)	Yes (10)
Benzo(a)pyrene	1.03	6.06	Yes (10)	-	Yes (10)	Yes (10)
Benzo(b)fluoranthene	0.938	5.69	Yes (10)	-	-	-
Benzo(e)pyrene	0.896	4.2	Yes (10)	-	-	-
Benzo(ghi)perylene	0.84	3.96	Yes (10)	-	-	-
Benzo(k)fluoranthene	0.446	2.35	Yes (10)	-	-	-
C1 Naphthalene	1.22	5.24	Yes (10)	-	-	-
C1 Phenanthrene	1.08	3.62	Yes (10)	-	-	-
C2 Naphthalene	1.05	4.61	Yes (10)	-	-	-
C3 Naphthalene	0.985	3.95	Yes (10)	-	-	-
Chrysene	0.971	4.66	Yes (10)	-	Yes (10)	Yes (10)
Dibenzo(ah)anthracene	0.163	0.824	Yes (10)	-	Yes (10)	Yes (10)
Fluoranthene	1.92	12.8	Yes (10)	-	Yes (10)	Yes (10))
Fluorene	0.471	1.72	Yes (10)	-	Yes (10)	Yes (10)
Indeno(1,2,3-c,d)pyrene	0.729	4.15	Yes (10)	-	-	-
Naphthalene	0.916	3.58	Yes (10)	-	Yes (10)	Yes (10)
Perylene	0.302	1.86	Yes (10)	-	-	-
Phenanthrene	1.52	5.51	Yes (10)	-	Yes (10)	Yes (10)
Pyrene	1.9	10.6	Yes (10)	-	Yes (10)	Yes (10)
PCB – sum of ICES7	0.009	1.07	Yes (9)	-	-	-

Contaminant	Min conc. (mg/kg) (dry weight)	Max conc. (mg/kg) (dry weight	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)	TEL exceedance (number of samples)	PEL exceedance (number of samples)
PCB – sum of ICES25	0.018	1.91	Yes (10)	Yes (1)	-	-
Alpha-hexachlorocyclohexane	0.0001	0.00173	-	-	-	-
Beta-hexachlorocyclohexane	0.0001	0.00088	-	-	-	-
Gamma-hexachlorocyclohexane	0.00021	0.00155	-	-	-	-
Dieldrin	0.00041	0.00519	Yes (1)	-	-	-
Hexachlorobenzene	0.00199	0.0457	-	-	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	0.0015	0.0129		-	-	-
Dichlorodiphenyltrichloroethane (PPDDT)	0.00134	0.0265	Yes (10)	-	-	-
1,1,-dichloro-2,2-bis(p-chlorophenyl) ethane (PPTDE)	0.00019	0.00291	-	-	-	-
BDE17	0.00033	0.0007	-	-	-	-
BDE28	0.00024	0.00048	-	-	-	-
BDE47	0.00138	0.00264	-	-	-	-
BDE66	0.00014	0.0004	-	-	-	-
BDE85	0.00008	0.00016	-	-	-	-
BDE99	0.00119	0.00242	-	-	-	-
BDE100	0.00026	0.00043	-	-	-	-
BDE138	0.00005	0.00028	-	-	-	-
BDE153	0.00029	0.0005	-	-	-	-
BDE154	0.00022	0.00036	-	-	-	-
BDE183	0.00055	0.00119	-	-	-	-
BDE209	0.247	0.912	-	-	-	-

Hartlepool – 10 samples

Contaminant	Min. conc. (mg/kg)	Max. conc. (mg/kg)	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)
Arsenic	18.5	39.6	Yes (9)	No (0)
Cadmium	0.073	0.215	No (0)	No (0)
Chromium	16.7	88.2.7	Yes (6)	No (0)
Copper	8.27	57.4	No (3)	No (0)
Mercury	0.039	0.368	Yes (5)	No (0)
Nickel	9.42	38.2	Yes (7)	No (0)
Lead	24.8	123	Yes (7)	No (0)
Zinc	56.7	221	Yes (5)	No (0)
DBT	<LOD	0.00741	No (0)	No (0)
TBT	<LOD	0.0166	No (0)	No (0)
Acenapthene	<LOD	<LOD	No (0)	-
Acenapthylene	<LOD	<LOD	No (0)	-
Anthracene	<LOD	0.47223	Yes (6)	-
Benz(a)anthracene	<LOD	0.83764	Yes (6)	-
Benzo(a)pyrene	<LOD	0.575004	Yes (6)	-
Benzo(b)fluoranthene	<LOD	0.642359	Yes (6)	-
Benzo(g,h,i)perylene	<LOD	0.558755	Yes (6)	-
Benzo(e)pyrene	<LOD	0.649038	Yes (6)	-
Benzo(k)fluoranthene	<LOD	0.288141	Yes (5)	-
C1-napthalenes	0.458125	10.74545	Yes (10	-
C1-phenanthrenes	0.22586	5.600085	Yes (10)	-
C2-napthalenes	0.442963	10.44786	Yes (10)	-
C3-napthalenes	0.301521	7.250214	Yes (10)	-
Chrysene	<LOD	0.723167	Yes (6)	-
Dibenz(a,h)anthracene	<LOD	0.105163	Yes (2)	-
Fluoranthene	0.045435	1.616836	Yes (7)	-
Fluorene	<LOD	0.577299	Yes (6)	-
Indeno(123-cd)pyrene	<LOD	0.405161	Yes (6)	-
Napthalene	0.133967	3.826396	Yes (10)	-
Perylene	<LOD	<LOD	No (0)	-
Phenanthrene	0.13749	3.843338	Yes (10)	-
Pyrene	0.043093	1.481493	Yes (7)	-

Contaminant	Min. conc. (mg/kg)	Max. conc. (mg/kg)	Action Level 1 exceedance (number of samples)	Action Level 2 exceedance (number of samples)
Total hydrocarbon content	181	3,630	-	-

Appendix D – Year 6 sample results/2023 additional samples

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Metals as mg/kg dry weight							
				Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)	Zinc (Zn)
MAR01178.001		Chart 1	56.7	13.3	1.41	67.2	60.7	0.57	30.8	326	343
MAR01178.002		Chart 2	37	14.6	1.38	87.5	66.9	0.76	31.6	344	343
MAR01178.003		Chart 3	45.7	15.4	1.12	103	64.5	0.76	27.6	252	291
MAR01178.004		Chart 4	48.2	16.4	0.86	71.7	65.1	0.68	25.5	176	252
MAR01178.005		Chart 5	73.6	7.9	0.29	14.7	18.2	0.1	15.2	32.2	66.5
MAR01178.006		Chart 6	41.9	25.2	0.76	63.2	70.9	0.63	31	150	252
MAR01178.007		Chart 7	42.3	23.9	0.63	58.4	67.1	0.57	31	117	209
MAR01178.008		Chart 8	39.8	28.5	0.31	42.4	39.9	0.38	27	99.8	152
MAR01178.009		Chart 9	70.7	14.8	0.1	11.3	12	0.07	8.9	29.5	52
MAR01178.010		Chart 10	66.7	19.4	0.14	17.3	18.3	0.13	13.3	39.3	73.8
MAR01178.011		Chart 11	67.5	16.6	0.12	16.1	15.5	0.17	12.1	33.7	62.3
MAR01178.012		Chart 12	73	11.9	0.09	12.6	9.8	0.05	9.2	22.6	50.5
MAR01178.013		Seaton Channel 1	49.2	24	0.25	36.2	31.7	0.27	23.1	76.4	122
MAR01178.014		Seaton Channel 2	61.7	21.5	0.2	22.1	21	0.15	15.3	49	86.9
MAR01178.015		Tees Dock	34.7	25.2	0.5	54.4	59.6	0.48	31.6	122	214
MAR01178.016		North Tees Berths	36.9	27	0.59	60	61.5	0.56	33.5	139	219
MAR01178.017		Navigator North Tees	36.9	26.6	0.55	59	59.4	0.52	33.6	132	207
MAR01178.018		Phillips Terminal	46.8	27.6	0.3	38.8	34.5	0.3	26	91.6	139
MAR01178.019		Hartlepool Channel	46.2	33.4	0.24	27.8	31.4	0.25	21.4	74.7	125
MAR01178.020		Hartlepool Berths	62	34.1	0.26	18.2	27	0.19	16.6	54.1	104
		Limits of detection (mg/kg dry weight):		0.5	0.04	0.5	0.5	0.01	0.5	0.5	2

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Organotins as mg/kg dry weight	
				Dibutyltine (DBT)	Tributyltin (TBT)
MAR01178.001		Chart 1	56.7	<LOD	<LOD
MAR01178.002		Chart 2	37	<LOD	<LOD
MAR01178.003		Chart 3	45.7	0.015	<LOD
MAR01178.004		Chart 4	48.2	0.012	0.027
MAR01178.005		Chart 5	73.6	<LOD	0.052
MAR01178.006		Chart 6	41.9	0.022	0.019
MAR01178.007		Chart 7	42.3	<LOD	<LOD
MAR01178.008		Chart 8	39.8	<LOD	<LOD
MAR01178.009		Chart 9	70.7	<LOD	<LOD
MAR01178.010		Chart 10	66.7	<LOD	<LOD
MAR01178.011		Chart 11	67.5	<LOD	<LOD
MAR01178.012		Chart 12	73	<LOD	<LOD
MAR01178.013		Seaton Channel 1	49.2	<LOD	<LOD
MAR01178.014		Seaton Channel 2	61.7	<LOD	<LOD
MAR01178.015		Tees Dock	34.7	<LOD	<LOD
MAR01178.016		North Tees Berths	36.9	0.014	0.016
MAR01178.017		Navigator North Tee	36.9	0.018	0.015
MAR01178.018		Phillips Terminal	46.8	<LOD	<LOD
MAR01178.019		Hartlepool Channel	46.2	<LOD	<LOD
MAR01178.020		Hartlepool Berths	62	<LOD	0.017
		Limits of detection (mg/kg dry weight):		0.005	0.005

Sample ID(s)	PAHs as mg/kg dry weight																				
	Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[g,h,i]perylene	Benzo[e]pyrene	Benzo[k]fluoranthene	C1-Napthalenes	C1-Phenanthrenes	C2-Napthalenes	C3-Napthalenes	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[123-c,d]pyrene	Naphthalene	Perylene	Phenanthrene	Pyrene
Chart 1	0.112	0.0534	0.12	0.307	0.34	0.373	0.316	0.341	0.175	0.421	0.298	0.317	0.246	0.284	0.0623	0.638	0.114	0.293	0.29	0.161	0.41	0.598
Chart 2	0.415	0.203	0.43	1.1	1.26	1.33	1.1	1.17	0.625	1.39	0.926	1.02	0.812	0.996	0.231	2.12	0.469	1.1	1.04	0.723	1.3	2.07
Chart 3	0.424	0.197	0.442	1.16	1.29	1.29	1.06	1.12	0.697	1.43	0.946	1.07	0.877	1.02	0.181	2.19	0.438	1.08	0.967	0.541	1.37	2.27
Chart 4	0.67	0.364	0.817	1.4	1.41	1.33	1.02	1.16	0.75	2.05	1.36	1.61	1.29	1.13	0.246	2.3	0.677	1.07	1.1	0.424	2.29	2.19
Chart 5	0.106	0.0393	0.0779	0.14	0.161	0.166	0.152	0.16	0.0805	0.7	0.268	0.495	0.376	0.14	0.0321	0.262	0.0975	0.136	0.319	0.0574	0.273	0.261
Chart 6	0.45	0.331	0.391	0.78	0.863	0.902	0.849	0.877	0.458	3.68	1.68	2.93	2.5	0.77	0.143	1.27	0.56	0.734	1.44	0.26	1.54	1.38
Chart 7	0.293	0.284	0.34	0.684	0.743	0.775	0.767	0.784	0.436	4.06	1.82	3.31	2.95	0.645	0.161	1.04	0.457	0.65	1.56	0.2	1.55	1.19
Chart 8	0.191	0.11	0.228	0.507	0.505	0.525	0.567	0.58	0.253	3.56	1.55	2.91	2.64	0.604	0.117	0.801	0.313	0.432	1.3	0.13	1.33	0.803
Chart 9	0.0561	0.0211	0.049	0.0907	0.0755	0.0698	0.101	0.119	0.0294	2.03	0.703	1.53	1.17	0.103	0.0188	0.134	0.106	0.0384	0.774	0.0122	0.558	0.155
Chart 10	0.123	0.137	0.16	0.29	0.262	0.241	0.303	0.328	0.129	3.54	1.48	2.86	2.38	0.327	0.0575	0.45	0.241	0.156	1.27	0.053	1.15	0.468
Chart 11	0.212	0.0814	0.466	1.05	1.07	0.875	0.804	0.869	0.418	3.37	1.69	2.74	2.34	0.94	0.12	2.14	0.309	0.767	1.29	0.306	2.3	1.96
Chart 12	0.0135	0.00529	0.0172	0.0252	0.0236	0.022	0.029	0.0341	0.013	0.366	0.148	0.292	0.238	0.0282	0.00536	0.0403	0.0232	0.0157	0.135	0.00503	0.113	0.0477
Seaton Channel 1	0.168	0.0766	0.222	0.501	0.472	0.472	0.471	0.522	0.238	3.4	1.57	2.81	2.38	0.485	0.0774	0.854	0.284	0.372	1.21	0.116	1.34	0.84
Seaton Channel 2	0.132	0.063	0.245	0.457	0.425	0.388	0.404	0.449	0.179	3.31	1.45	2.62	2.17	0.451	0.068	0.803	0.237	0.294	1.21	0.104	1.34	0.782
Tees Dock	0.259	0.186	0.288	0.681	0.779	0.828	0.802	0.813	0.359	3.3	1.53	2.69	2.41	0.697	0.167	1.1	0.385	0.693	1.26	0.23	1.43	1.11
North Tees Berths	0.276	0.207	0.312	0.7	0.763	0.807	0.764	0.796	0.401	3.24	1.58	2.59	2.24	0.702	0.139	1.13	0.398	0.658	1.33	0.212	1.38	1.18
Navigator North Tees	0.249	0.189	0.296	0.639	0.681	0.707	0.68	0.717	0.328	3.26	1.53	2.63	2.22	0.627	0.122	1.02	0.372	0.581	1.34	0.191	1.35	1.07
Phillips Terminal	0.181	0.0945	0.231	0.532	0.511	0.514	0.54	0.567	0.272	3.65	1.63	2.96	2.58	0.525	0.111	0.87	0.306	0.39	1.34	0.133	1.4	0.846
Hartlepool Channel	0.317	0.186	0.679	1.34	1.19	1.05	1.05	1.14	0.499	8.41	3.48	6.7	5.73	1.17	0.226	2.47	0.611	0.876	3.06	0.311	3.42	2.17
Hartlepool Berths	0.356	0.236	1.75	2.45	2.03	1.6	1.37	1.7	0.771	11.3	5.34	9.09	7.46	1.99	0.343	4.37	0.874	1.25	3.98	0.503	5.56	3.63

Sample ID(s)	PCBs as mg/kg dry weight																							
	2,2',4,5,5'-Pentachlorobiphenyl	2,3,3',4,4'-Pentachlorobiphenyl	2,3,3',4',6-Pentachlorobiphenyl	**2,3',4,4',5-Pentachlorobiphenyl**	2,2',3,3',4,4'-Hexachlorobiphenyl	**2,2',3,4,4',5'-Hexachlorobiphenyl**	2,2',3,4,5,5'-Hexachlorobiphenyl	2,2',3,4',5',6-Hexachlorobiphenyl	2,2',3,5,5',6-Hexachlorobiphenyl	**2,2',4,4',5,5'-Hexachlorobiphenyl**	2,3,3',4,4',5-Hexachlorobiphenyl	2,3,3',4,4',6-Hexachlorobiphenyl	2,2',3,3',4,4',5-Heptachlorobiphenyl	2,2',5-Trichlorobiphenyl	**2,2',3,4,4',5,5'-Heptachlorobiphenyl**	2,2',3,4,4',5',6-Heptachlorobiphenyl	2,2',3,4',5,5',6-Heptachlorobiphenyl	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	**2,4,4'-Trichlorobiphenyl**	2,4',5-Trichlorobiphenyl	2,2',3,5'-Tetrachlorobiphenyl	2,2',4,4'-Tetrachlorobiphenyl	2,2',4,5'-Tetrachlorobiphenyl	**2,2',5,5'-Tetrachlorobiphenyl**	2,3',4,4'-Tetrachlorobiphenyl
	CB101	CB105	CB110	**CB118**	CB128	**CB138**	CB141	CB149	CB151	**CB153**	CB156	CB158	CB170	CB18	**CB180**	CB183	CB187	CB194	**CB28**	CB31	CB44	CB47	CB49	**CB52**	CB66
Chart 1	**0.00151**	**0.00047**	**0.00157**	**0.00109**	**0.00037**	**0.00248**	**0.0004**	**0.00215**	**0.00075**	**0.00334**	**0.00018**	**0.00036**	**0.00108**	**0.0007**	**0.00409**	**0.00075**	**0.00287**	**0.00123**	**0.00145**	**0.00126**	**0.00071**	**0.00052**	**0.00116**	**0.00143**	**0.00136**
Chart 2	**0.00038**	**0.00081**	**0.0024**	**0.00204**	**0.00041**	**0.00321**	**0.00073**	**0.00344**	**0.00148**	**0.00508**	**0.00022**	**0.00032**	**0.00138**	**0.00112**	**0.00471**	**0.00084**	**0.00316**	**0.00123**	**0.00234**	**0.00205**	**0.00128**	**0.00075**	**0.00195**	**0.00226**	**0.00221**
Chart 3	**0.00114**	**0.00037**	**0.00094**	**0.00077**	**0.00023**	**0.00149**	**0.00026**	**0.00116**	**0.00035**	**0.00199**	**0.00013**	**0.00027**	**0.00054**	**0.00054**	**0.00181**	**0.00044**	**0.00115**	**0.00049**	**0.001**	**0.00097**	**0.00056**	**0.00035**	**0.00087**	**0.00098**	**0.00094**
Chart 4	**0.00127**	**0.00037**	**0.00107**	**0.00094**	**0.00021**	**0.00134**	**0.0001**	**0.00112**	**0.00029**	**0.0018**	**0.00014**	**0.00021**	**0.00042**	**0.00049**	**0.00127**	**0.00028**	**0.00087**	**0.00033**	**0.00092**	**0.00081**	**0.00047**	**0.00026**	**0.00071**	**0.00091**	**0.00085**
Chart 5	**0.00056**	**0.00019**	**0.00047**	**0.00054**	**0.00009**	**0.00064**	**0.00008**	**0.00048**	**0.00013**	**0.00078**	**<LOD**	**0.00013**	**0.00013**	**0.00022**	**0.00063**	**0.00014**	**0.00036**	**0.00013**	**0.00045**	**0.00038**	**0.00024**	**0.00014**	**0.00035**	**0.00041**	**0.00038**
Chart 6	**0.00131**	**0.00052**	**0.00116**	**0.00116**	**0.00016**	**0.00128**	**0.00019**	**0.00107**	**0.0004**	**0.00183**	**0.00011**	**0.00031**	**0.00033**	**0.00042**	**0.00099**	**0.00022**	**0.00062**	**0.00024**	**0.00088**	**0.0008**	**0.00041**	**0.00025**	**0.00062**	**0.00082**	**0.00074**
Chart 7	**0.00118**	**0.00042**	**0.00097**	**0.00118**	**0.00017**	**0.00133**	**0.00018**	**0.00091**	**0.00024**	**0.0016**	**0.0001**	**0.00019**	**0.00028**	**0.0004**	**0.00071**	**0.00014**	**0.00058**	**0.00019**	**0.00087**	**0.00079**	**0.00044**	**0.00022**	**0.00055**	**0.00074**	**0.0007**
Chart 8	**0.00077**	**0.00034**	**0.00074**	**0.00075**	**0.00014**	**0.00078**	**0.00008**	**0.00057**	**0.0001**	**0.00093**	**0.0001**	**0.00011**	**0.00019**	**0.00024**	**0.0005**	**0.00015**	**0.00034**	**0.00018**	**0.0005**	**0.00048**	**0.00031**	**0.00013**	**0.00038**	**0.00053**	**0.00038**
Chart 9	**0.00019**	**<LOD**	**0.00016**	**0.00016**	**<LOD**	**0.00021**	**<LOD**	**0.00017**	**<LOD**	**0.00019**	**<LOD**	**<LOD**	**<LOD**	**0.00009**	**0.00011**	**<LOD**	**<LOD**	**<LOD**	**0.00011**	**0.00015**	**0.00009**	**<LOD**	**<LOD**	**0.00017**	**0.0001**
Chart 10	**0.00028**	**0.00008**	**0.0003**	**0.00028**	**<LOD**	**0.0004**	**<LOD**	**0.00021**	**0.0001**	**0.00026**	**<LOD**	**<LOD**	**<LOD**	**0.00015**	**0.00018**	**<LOD**	**<LOD**	**<LOD**	**0.00022**	**0.00034**	**0.00011**	**<LOD**	**0.00015**	**0.00028**	**0.0002**
Chart 11	**0.00025**	**0.00008**	**0.00027**	**0.00028**	**<LOD**	**0.00042**	**<LOD**	**0.00024**	**<LOD**	**0.00039**	**<LOD**	**<LOD**	**<LOD**	**0.00014**	**0.00022**	**<LOD**	**0.00021**	**<LOD**	**0.0002**	**0.00029**	**0.00018**	**<LOD**	**0.00014**	**0.00031**	**0.00018**
Chart 12	**0.00013**	**<LOD**	**0.00012**	**<LOD**	**<LOD**	**0.00015**	**<LOD**	**0.0001**	**<LOD**	**0.00009**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**0.00013**	**<LOD**
Seaton Channel 1	**0.00094**	**0.00028**	**0.00108**	**0.00103**	**0.00015**	**0.00106**	**0.00014**	**0.00071**	**0.0002**	**0.00097**	**0.00012**	**0.00015**	**0.00016**	**0.00039**	**0.00051**	**0.00009**	**0.00031**	**0.0001**	**0.00068**	**0.00086**	**0.00053**	**0.0002**	**0.00043**	**0.00092**	**0.00057**
Seaton Channel 2	**0.00032**	**0.00009**	**0.00034**	**0.00032**	**<LOD**	**0.00041**	**<LOD**	**0.0002**	**<LOD**	**0.00028**	**<LOD**	**<LOD**	**<LOD**	**0.00017**	**0.00017**	**<LOD**	**0.00014**	**<LOD**	**0.00024**	**0.0003**	**0.00017**	**<LOD**	**0.00017**	**0.00038**	**0.00022**
Tees Dock	**0.00092**	**0.00031**	**0.00105**	**0.00122**	**0.00025**	**0.0014**	**0.00016**	**0.00084**	**0.00023**	**0.00126**	**0.00011**	**0.00015**	**0.0002**	**0.00038**	**0.00062**	**0.00015**	**0.0005**	**0.00015**	**0.0007**	**0.00076**	**0.00037**	**0.00018**	**0.00045**	**0.00081**	**0.00066**
North Tees Berths	**0.001**	**0.0003**	**0.00116**	**0.00159**	**0.00023**	**0.00129**	**0.00011**	**0.00081**	**0.00017**	**0.00126**	**0.00011**	**0.00013**	**0.00017**	**0.00045**	**0.0007**	**0.00017**	**0.00057**	**0.00016**	**0.00079**	**0.00096**	**0.00048**	**0.00019**	**0.00053**	**0.00098**	**0.00076**
Navigator North Tees	**0.00097**	**0.00034**	**0.00099**	**0.00135**	**0.0002**	**0.00134**	**0.00017**	**0.00088**	**0.00024**	**0.00129**	**0.00009**	**0.00013**	**0.00023**	**0.00044**	**0.00064**	**0.00012**	**0.00043**	**0.00014**	**0.00076**	**0.00091**	**0.00045**	**0.0002**	**0.00052**	**0.00106**	**0.00065**
Phillips Terminal	**0.0007**	**0.0002**	**0.00078**	**0.001**	**0.00016**	**0.00086**	**0.00017**	**0.00061**	**0.00014**	**0.00073**	**<LOD**	**0.0001**	**0.00014**	**0.0003**	**0.00046**	**0.00014**	**0.00031**	**0.00009**	**0.00051**	**0.00062**	**0.00031**	**0.00013**	**0.00035**	**0.00065**	**0.00053**
Hartlepool Channel	**0.00072**	**0.00018**	**0.00074**	**0.00081**	**0.00014**	**0.0006**	**0.00011**	**0.00059**	**<LOD**	**0.00077**	**0.00008**	**0.0001**	**0.00021**	**0.00035**	**0.00054**	**0.00015**	**0.00037**	**0.0001**	**0.00046**	**0.00062**	**0.00034**	**0.00014**	**0.00033**	**0.00083**	**0.00041**
Hartlepool Berths	**0.00045**	**0.0001**	**0.00043**	**0.00048**	**0.00012**	**0.00044**	**<LOD**	**0.00029**	**<LOD**	**0.00039**	**<LOD**	**<LOD**	**<LOD**	**0.00025**	**0.00021**	**<LOD**	**0.00014**	**<LOD**	**0.0003**	**0.00041**	**0.0002**	**0.0001**	**0.00023**	**0.00052**	**0.00029**

Laboratory sample number	Dredge Area	Sample ID(s)	Total Solids (%)	Organochlorine pesticides as mg/kg dry weight							
				alpha-hexachlorocyclohexane (AHCH)	beta-hexachlorocyclohexane (BHCH)	gamma-hexachlorocyclohexane (GHCH)	Dieldrin	Hexachlorobenzene (HCB)	1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	Dichlorodiphenyltrichloroethane (PPDDT)	1,1-dichloro-2,2-bis(p-chlorophenyl)ethane (PPTDE)
MAR01178.001		Chart 1	56.7	<LOD	0.0002	0.0003	0.002	0.0024	0.004	0.001	0.0019
MAR01178.002		Chart 2	37	<LOD	<LOD	0.0003	0.0029	0.0029	0.0045	0.0006	0.0025
MAR01178.003		Chart 3	45.7	<LOD	<LOD	0.0002	0.0011	0.0015	0.0016	<LOD	0.001
MAR01178.004		Chart 4	48.2	<LOD	<LOD	0.0002	0.0012	0.0017	0.0014	0.0001	0.001
MAR01178.005		Chart 5	73.6	<LOD	<LOD	0.0001	0.0004	0.0008	0.0006	0.0002	0.0006
MAR01178.006		Chart 6	41.9	<LOD	<LOD	0.0002	0.0006	0.0018	0.0013	0.0009	0.0009
MAR01178.007		Chart 7	42.3	<LOD	<LOD	0.0002	0.0005	0.0016	0.0011	0.0006	0.0009
MAR01178.008		Chart 8	39.8	<LOD	<LOD	0.0001	0.0004	0.0013	0.0009	0.0009	0.001
MAR01178.009		Chart 9	70.7	<LOD	<LOD	<LOD	<LOD	0.0003	0.0001	0.0003	0.0002
MAR01178.010		Chart 10	66.7	<LOD	<LOD	<LOD	0.0002	0.0006	0.0003	0.0001	0.0006
MAR01178.011		Chart 11	67.5	<LOD	<LOD	0.0002	0.0002	0.0005	0.0002	0.0007	0.0009
MAR01178.012		Chart 12	73	<LOD	<LOD	<LOD	<LOD	0.0003	0.0001	0.0006	0.0003
MAR01178.013		Seaton Channel 1	49.2	<LOD	<LOD	0.0003	0.0007	0.0036	0.001	0.0004	0.0019
MAR01178.014		Seaton Channel 2	61.7	<LOD	<LOD	<LOD	<LOD	0.0009	0.0003	0.0002	0.0006
MAR01178.015		Tees Dock	34.7	<LOD	<LOD	0.0003	0.0004	0.0015	0.001	0.0004	0.0012
MAR01178.016		North Tees Berths	36.9	<LOD	0.0001	0.0004	0.0003	0.0015	0.0008	0.0004	0.0017
MAR01178.017		Navigator North Tee	36.9	<LOD	<LOD	0.0003	0.0003	0.0016	0.0011	0.0023	0.0013
MAR01178.018		Philips Terminal	46.8	<LOD	<LOD	0.0003	0.0003	0.0015	0.0005	0.0006	0.0013
MAR01178.019		Hartlepool Channel	46.2	<LOD	<LOD	0.0003	0.0002	0.001	0.0006	0.0008	0.001
MAR01178.020		Hartlepool Berths	62	<LOD	<LOD	0.0003	0.0003	0.0007	0.0004	0.0019	0.0023
		Limits of detection (mg/kg dry weight)		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Royal HaskoningDHV

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Metals as mg/kg dry weight							
				Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)	Zinc (Zn)
MAR02085.001		CHART 1	32.2	14.8	1.26	124	57.7	0.54	34.8	351	368
MAR02085.002		CHART 3	48.8	15.1	0.93	76.9	62.6	0.73	27.4	210	271
MAR02085.003		CHART 7	48.9	15.7	0.29	45.3	42.5	0.28	31.8	71.5	131
MAR02085.004		CHART 8	47.7	23.6	0.38	47.6	53	0.58	30.8	112	179
MAR02085.005		C9_1	66.8	22	0.13	14.8	15.6	0.14	13	46.3	80.2
MAR02085.006		C9_2	63.4	19.7	0.11	14.5	14.2	0.13	12.6	42.3	75.2
MAR02085.007		C9_3	56.9	21.4	0.14	15.1	16.2	0.16	13.2	44.6	84.3
MAR02085.008		CHART 10	80.9	10.3	<LOD	5.6	4	0.03	5.6	14.2	35.1
MAR02085.009		CHART 11	68.5	10.5	0.05	8.1	5	0.05	7.4	14.8	45
MAR02085.010		H/POOL CHANNEL	72	20	0.07	7.7	11.2	0.05	8.6	28.3	63.5

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Organotins as mg/kg dry weight	
				Dibutyltine (DBT)	Tributyltin (TBT)
MAR02085.001		CHART 1	32.2	<LOD	<LOD
MAR02085.002		CHART 3	48.8	<LOD	0.012
MAR02085.003		CHART 7	48.9	<LOD	<LOD
MAR02085.004		CHART 8	47.7	<LOD	<LOD
MAR02085.005		C9_1	66.8	<LOD	<LOD
MAR02085.006		C9_2	63.4	<LOD	0.009
MAR02085.007		C9_3	56.9	<LOD	<LOD
MAR02085.008		CHART 10	80.9	<LOD	<LOD
MAR02085.009		CHART 11	68.5	<LOD	<LOD
MAR02085.010		H/POOL CHANNEL	72	<LOD	<LOD

Sample ID(s)	PAHs as mg/kg dry weight																				
	Acenaphthene	Acenaphthylene	**Anthracene**	**Benz[a]anthracene**	**Benzo[a]pyrene**	Benzo[b]fluoranthene	**Benzo[g,h,i]perylene**	Benzo[e]pyrene	Benzo[k]fluoranthene	C1-Napthalenes	C1-Phenanthrenes	C2-Napthalenes	C3-Napthalenes	**Chrysene**	Dibenz[a,h]anthracene	**Fluoranthene**	Fluorene	**Indeno[123-c,d]pyrene**	Naphthalene	Perylene	**Phenanthrene**	**Pyrene**
CHART 1	0.621	0.263	0.431	0.872	1.01	0.996	0.79	0.763	0.913	1.59	0.974	1.31	1	0.967	0.145	2.11	0.654	0.691	0.988	0.324	1.22	1.91
CHART 3	0.762	0.302	0.674	1.31	1.42	1.34	1.03	0.985	1.25	2.25	1.38	1.8	1.47	1.37	0.219	2.97	0.793	1.01	1.57	0.449	1.81	2.8
CHART 7	0.714	0.222	0.27	0.41	0.454	0.442	0.405	0.369	0.357	2.24	1.05	1.84	1.61	0.508	0.0789	0.806	0.651	0.337	0.952	0.0968	1.06	0.782
CHART 8	0.312	0.274	0.336	0.563	0.567	0.545	0.517	0.489	0.464	3.77	1.85	3.08	2.76	0.677	0.107	1.01	0.522	0.425	1.38	0.113	1.48	1.05
C9_1	0.208	0.0774	0.18	0.335	0.318	0.26	0.338	0.33	0.212	6.41	2.25	5.22	4.34	0.445	0.0636	0.521	0.373	0.162	2.18	0.0472	1.76	0.552
C9_2	0.127	0.041	0.133	0.241	0.234	0.2	0.241	0.233	0.164	3.75	1.45	3.1	2.73	0.302	0.0472	0.38	0.231	0.136	1.18	0.0386	1.1	0.402
C9_3	0.213	0.0769	0.218	0.391	0.369	0.325	0.378	0.361	0.268	5.98	2.23	4.97	4.32	0.496	0.061	0.661	0.391	0.231	1.88	0.0624	1.77	0.688
CHART 10	0.0177	0.00866	0.0155	0.0266	0.0246	0.0218	0.0273	0.0285	0.016	0.748	0.222	0.605	0.443	0.0395	0.005	0.0423	0.0367	0.0114	0.223	0.00385	0.163	0.0496
CHART 11	0.0354	0.0122	0.0323	0.0549	0.045	0.0412	0.0484	0.0522	0.0294	1.1	0.404	0.918	0.824	0.0718	0.00738	0.0874	0.0651	0.0201	0.356	0.00778	0.314	0.0977
H/POOL CHANNEL	0.0504	0.0184	0.0337	0.0621	0.0456	0.0373	0.057	0.065	0.0287	2.37	0.688	1.82	1.39	0.0944	0.0113	0.0813	0.107	0.0163	0.719	0.00401	0.521	0.0988

Sample ID(s)	PCBs as mg/kg dry weight																						
	2,2',4,5,5'-Pentachlorobiphenyl	2,3,3',4,4'-Pentachlorobiphenyl	2,3,3',4',6-Pentachlorobiphenyl	**2,3',4,4',5-Pentachlorobiphenyl**	2,2',3,3',4,4'-Hexachlorobiphenyl	**2,2',3,4,4',5'-Hexachlorobiphenyl**	2,2',3,4,5,5'-Hexachlorobiphenyl	2,2',3,4,4',5'-Hexachlorobiphenyl	2,2',3,5,5',6-Hexachlorobiphenyl	**2,2',4,4',5,5'-Hexachlorobiphenyl**	2,3,3',4,4',5-Hexachlorobiphenyl	2,3,3',4,4',6-Hexachlorobiphenyl	2,2',3,3',4,4',5-Heptachlorobiphenyl	2,2',5-Trichlorobiphenyl	**2,2',3,4,4',5,5'-Heptachlorobiphenyl**	2,2',3,4,4',5',6-Heptachlorobiphenyl	2,2',3,4',5,5',6-Heptachlorobiphenyl	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	**2,4,4'-Trichlorobiphenyl**	2,4',5-Trichlorobiphenyl	2,2',3,5'-Tetrachlorobiphenyl	2,2',4,4'-Tetrachlorobiphenyl	2,2',4,5'-Tetrachlorobiphenyl	**2,2',5,5'-Tetrachlorobiphenyl**	2,3',4,4'-Tetrachlorobiphenyl
	CB101	CB105	CB110	**CB118**	CB128	**CB138**	CB141	CB149	CB151	**CB153**	CB156	CB158	CB170	CB18	**CB180**	CB183	CB187	CB194	**CB28**	CB31	CB44	CB47	CB49	**CB52**	CB66
CHART 1	**0.00085**	**0.00023**	**0.00089**	**0.00068**	**0.00014**	**0.00084**	**0.0001**	**0.00135**	**0.00042**	**0.00167**	**0.00009**	**0.0001**	**0.00049**	**0.00033**	**0.00181**	**0.00048**	**0.00109**	**0.00046**	**0.00066**	**0.00057**	**0.00043**	**0.00021**	**0.00054**	**0.00069**	**0.00064**
CHART 3	**0.00123**	**0.00028**	**0.0012**	**0.00117**	**0.00024**	**0.00106**	**0.00026**	**0.00134**	**0.00036**	**0.00169**	**0.00013**	**0.00019**	**0.00047**	**0.00051**	**0.00144**	**0.00035**	**0.00089**	**0.00041**	**0.00093**	**0.00092**	**0.00057**	**0.00032**	**0.00079**	**0.00102**	**0.00087**
CHART 7	**0.00052**	**0.00015**	**0.00055**	**0.00053**	**0.00012**	**0.00045**	**<LOD**	**0.00039**	**0.00014**	**0.00059**	**<LOD**	**<LOD**	**0.00014**	**0.00014**	**0.00021**	**0.0001**	**0.00019**	**0.00008**	**0.00032**	**0.0003**	**0.00018**	**0.00008**	**0.00025**	**0.00033**	**0.00028**
CHART 8	**0.00073**	**0.00024**	**0.00077**	**0.00064**	**0.00013**	**0.00075**	**0.00019**	**0.00063**	**0.00017**	**0.00094**	**0.00009**	**0.00009**	**0.00021**	**0.0003**	**0.00048**	**0.00012**	**0.00024**	**0.00014**	**0.00055**	**0.00054**	**0.0003**	**0.0001**	**0.00033**	**0.00051**	**0.00047**
C9_1	**0.00019**	**<LOD**	**0.0002**	**0.00019**	**<LOD**	**0.00016**	**<LOD**	**0.00017**	**<LOD**	**0.00026**	**<LOD**	**<LOD**	**<LOD**	**0.00014**	**0.00016**	**<LOD**	**0.00009**	**<LOD**	**0.00017**	**0.00018**	**0.0001**	**<LOD**	**0.00012**	**0.00019**	**0.00012**
C9_2	**0.00019**	**<LOD**	**0.00018**	**0.00018**	**<LOD**	**0.00019**	**<LOD**	**0.00015**	**<LOD**	**0.00025**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**0.00012**	**0.00011**	**0.0001**	**<LOD**	**0.00009**	**0.00014**	**0.0001**
C9_3	**0.00022**	**<LOD**	**0.00021**	**0.00016**	**<LOD**	**0.00019**	**<LOD**	**0.00017**	**<LOD**	**0.0002**	**<LOD**	**<LOD**	**<LOD**	**0.00009**	**0.00011**	**<LOD**	**<LOD**	**<LOD**	**0.00015**	**0.00014**	**0.00009**	**<LOD**	**0.00009**	**0.00015**	**0.00012**
CHART 10	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**0.00009**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**
CHART 11	**0.0001**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**0.00008**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**
H/POOL CHANNEL	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**0.00009**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**	**<LOD**

Sample ID	Brominated flame retardants as mg/kg dry weight											
	2,2′,4,4′,6-penta-bromodiphenyl ether (BDE100)	Hexabromodiphenyl ether (BDE138)	2,2′,4,4′,5,5′-hexa-bromodiphenyl ether (BDE153)	2,2′,4,4′,5,6′-hexa-bromodiphenyl ether (BDE154)	2,2´,4-tri-bromodiphenylether (BDE17)	2,2′,3,4,4′,5′,6-heptabromodiphenyl ether (BDE183)	2,2′,3,3′,4,4′,5,5′,6,6′-decabrominated diphenyl ether (BDE 209)	2,4,4′-tribromodiphenyl ether (BDE28)	2,2′,4,4′-Tetrabromodiphenyl ether (BDE47)	2,3′,4,4′-Tetrabromodiphenyl ether (BDE66)	2,2′,3,4,4′-Pentabromodiphenyl ether (BDE85)	2,2′,4,4′,5-pentabromodiphenyl ether (BDE99)
CHART 1	<LOD	<LOD	<LOD	0.00027	<LOD	0.00071	0.1124	<LOD	<LOD	<LOD	<LOD	0.00101
CHART 3	<LOD	0.00007	<LOD	0.00038	<LOD	0.00087	0.2491	<LOD	<LOD	<LOD	<LOD	0.00113
CHART 7	<LOD	<LOD	<LOD	0.00017	<LOD	0.00023	0.064	<LOD	<LOD	<LOD	<LOD	0.00125
CHART 8	<LOD	0.00006	<LOD	0.00037	<LOD	0.00037	0.0843	<LOD	<LOD	<LOD	<LOD	0.00149
C9_1	<LOD	<LOD	<LOD	0.00005	<LOD	0.00007	0.0282	<LOD	<LOD	<LOD	<LOD	0.00041
C9_2	<LOD	<LOD	<LOD	0.00006	<LOD	0.00009	0.0958	<LOD	<LOD	<LOD	<LOD	0.00043
C9_3	<LOD	<LOD	<LOD	0.0001	<LOD	0.00006	0.079	<LOD	<LOD	<LOD	<LOD	0.00093
CHART 10	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0032	<LOD	<LOD	<LOD	<LOD	0.00008
CHART 11	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0013	<LOD	<LOD	<LOD	<LOD	0.0003
H/POOL CHANNEL	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.00007

Laboratory sample number	Dredge Area	Sample ID(s)	Total Solids (%)	Organochlorine pesticides as mg/kg dry weight							
				alpha-hexachlorocyclohexane (AHCH)	beta-hexachlorocyclohexane (BHCH)	gamma-hexachlorocyclohexane (GHCH)	Dieldrin	Hexachlorobenzene (HCB)	1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	Dichlorodiphenyltrichloroe thane (PPDDT)	1,1-dichloro-2,2-bis(p-chlorophenyl)ethane (PPTDE)
MAR02085.001		CHART 1	32.2	<LOD	<LOD	0.0001	0.0007	0.0008	0.0013	0.0008	0.001
MAR02085.002		CHART 3	48.8	<LOD	<LOD	0.0002	0.0012	0.0011	0.0014	0.0009	0.001
MAR02085.003		CHART 7	48.9	<LOD	<LOD	<LOD	<LOD	0.0006	0.0004	0.0008	0.0005
MAR02085.004		CHART 8	47.7	<LOD	<LOD	0.0001	0.0003	0.0012	0.0008	0.0021	0.001
MAR02085.005		C9_1	66.8	<LOD	<LOD	<LOD	<LOD	0.0004	0.0002	0.0007	0.0004
MAR02085.006		C9_2	63.4	<LOD	<LOD	<LOD	<LOD	0.0004	0.0002	0.0001	0.0003
MAR02085.007		C9_3	56.9	<LOD	<LOD	<LOD	<LOD	0.0003	0.0002	0.0002	0.0003
MAR02085.008		CHART 10	80.9	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
MAR02085.009		CHART 11	68.5	<LOD	<LOD	<LOD	<LOD	0.0001	<LOD	<LOD	<LOD
MAR02085.010		H/POOL CHANNEL	72	<LOD	<LOD	<LOD	<LOD	0.0001	<LOD	<LOD	<LOD

Appendix E – Year 9 sample data

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Metals as mg/kg dry weight							
				Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)	Zinc (Zn)
MAR02481.001		1	29.1	12.3	1.1	136	49.7	0.3	34.2	310	352
MAR02481.002		2	27.9	11.4	1.05	122	47.1	0.29	34	280	333
MAR02481.003		3	31.7	13.1	0.92	93.6	55.8	0.41	35	238	313
MAR02481.004		4	32.5	17.7	0.86	95.6	68.7	0.58	35.2	227	297
MAR02481.005		5	46.4	16.4	0.77	79.7	85.9	0.56	34.4	205	301
MAR02481.006		6	41.4	17.4	0.83	92	70.9	0.64	34.8	216	287
MAR02481.007		7	37.1	17.3	0.57	76.4	57.9	0.4	34.1	174	244
MAR02481.008		8	46.6	15.7	0.58	74	66	0.46	33.2	147	260
MAR02481.009		9	60.8	11.7	0.24	46.1	48.7	0.19	36.1	56.8	126
MAR02481.010		10	45.8	21.7	0.32	59	54.6	0.36	33.1	106	186
MAR02481.011		11	47.8	24.9	0.81	81.2	91.8	0.79	35.4	169	302
MAR02481.012		12	44.4	20.2	0.44	63.5	63.4	0.47	33.1	112	201
MAR02481.013		13	49	19.6	0.45	55.5	58.7	0.4	31.8	102	202
MAR02481.014		15	63.5	19.7	0.3	47.2	42	0.36	29.1	87.9	151
MAR02481.015		17	48.9	26.4	0.14	43.9	37.5	0.29	28.4	89	136
MAR02481.016		18	52.5	27.6	0.15	41.8	34.7	0.28	28.3	88.4	133
MAR02481.017		19	48	27.9	0.14	41.4	34.7	0.29	27.9	79.9	130
MAR02481.018		20	51.6	30.9	0.14	43.1	40	0.3	30.5	93.9	142
MAR02481.019		21	55.8	22.4	0.19	48.2	44.8	0.3	30.6	97.4	163
MAR02481.020		22	44	21	0.06	26.9	23.3	0.16	20.3	50.5	90.5
MAR02481.021		23	58.8	19.8	<LOD	17.2	15.3	0.09	15.2	40.5	69
MAR02481.022		24	66.1	22.1	0.35	60.7	56.2	0.37	34	116	189
MAR02481.023		25	63.1	23.9	0.18	44.1	37.2	0.29	29.5	76.5	134
Limits of detection (mg/kg dry weight):				0.5	0.04	0.5	0.5	0.01	0.5	0.5	2

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Metals as mg/kg dry weight							
				Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Mercury (Hg)	Nickel (Ni)	Lead (Pb)	Zinc (Zn)
MAR02499.001		14	44.9	25.4	0.44	52.7	47.3	0.38	31.3	124	196
MAR02499.002		16	47.5	26.6	0.67	65.5	68.1	0.63	33.6	139	266
MAR02499.003		26	68.7	17.2	0.13	13.6	13.2	0.11	11.8	42.3	72.4
MAR02499.004		27	79.7	7.1	0.08	10.3	4.8	0.02	7.2	17.4	39.5
MAR02499.005		28	81.8	20.4	0.11	5.5	10.9	0.06	7.3	29.7	56.9
MAR02499.006		29	65.5	35.8	0.25	20.8	28.6	0.22	20.1	70.8	123
MAR02499.007		30	46	36.8	0.23	37	39.8	0.3	30.1	108	171
MAR02499.008		31	37	39.7	0.28	43	49.6	0.39	34	132	192

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Organotins as mg/kg dry weight	
				Dibutyltine (DBT)	Tributyltin (TBT)
MAR02481.001		1	29.1	<LOD	<LOD
MAR02481.002		2	27.9	<LOD	<LOD
MAR02481.003		3	31.7	<LOD	0.016
MAR02481.004		4	32.5	<LOD	0.016
MAR02481.005		5	46.4	0.014	0.013
MAR02481.006		6	41.4	0.019	0.016
MAR02481.007		7	37.1	<LOD	<LOD
MAR02481.008		8	46.6	0.014	0.022
MAR02481.009		9	60.8	<LOD	<LOD
MAR02481.010		10	45.8	<LOD	<LOD
MAR02481.011		11	47.8	0.027	0.029
MAR02481.012		12	44.4	<LOD	0.014
MAR02481.013		13	49	0.01	0.013
MAR02481.014		15	63.5	<LOD	<LOD
MAR02481.015		17	48.9	<LOD	<LOD
MAR02481.016		18	52.5	<LOD	<LOD
MAR02481.017		19	48	<LOD	<LOD
MAR02481.018		20	51.6	<LOD	<LOD
MAR02481.019		21	55.8	<LOD	<LOD
MAR02481.020		22	44	<LOD	<LOD
MAR02481.021		23	58.8	<LOD	<LOD
MAR02481.022		24	66.1	<LOD	<LOD
MAR02481.023		25	63.1	<LOD	<LOD

Laboratory sample number	Dredge Area	Sample ID(s)	Total solids (%)	Organotins as mg/kg dry weight	
				Dibutyltine (DBT)	Tributyltin (TBT)
MAR02499.001		14	44.9	<LOD	<LOD
MAR02499.002		16	47.5	0.012	0.027
MAR02499.003		26	68.7	<LOD	<LOD
MAR02499.004		27	79.7	<LOD	<LOD
MAR02499.005		28	81.8	<LOD	<LOD
MAR02499.006		29	65.5	<LOD	<LOD
MAR02499.007		30	46	<LOD	<LOD
MAR02499.008		31	37	<LOD	<LOD

Sample ID(s)	PAHs as mg/kg dry weight																			
	Acenaphthene	Acenaphthylene	**Anthracene**	**Benz[a]anthracene**	**Benzo[a]pyrene**	Benzo[b]fluoranthene	**Benzo[g,h,i]perylene**	Benzo[e]pyrene	Benzo[k]fluoranthene	C1-Napthalenes	C1-Phenanthrenes	C2-Napthalenes	C3-Napthalenes	**Chrysene**	Dibenz[a,h]anthracene	**Fluoranthene**	Fluorene	**Indeno[123-c,d]pyrene**	Naphthalene	Perylene	**Phenanthrene**	**Pyrene**
1	0.188	0.0965	0.142	0.51	0.61	0.655	0.51	0.49	0.56	0.866	0.54	0.751	0.61	0.649	0.107	1.2	0.213	0.423	0.455	0.183	0.669	1.07
2	0.27	0.182	0.213	0.656	0.772	0.709	0.601	0.587	0.701	0.962	0.778	0.882	0.768	0.795	0.109	1.46	0.295	0.527	0.527	0.21	0.824	1.31
3	0.248	0.118	0.243	0.728	0.836	0.828	0.662	0.619	0.794	1.07	0.926	0.833	0.749	0.812	0.139	1.7	0.272	0.581	0.488	0.271	0.853	1.52
4	0.471	0.184	0.426	0.928	1	0.965	0.735	0.702	0.883	1.44	1.04	1.3	1.03	0.998	0.163	2.19	0.474	0.66	0.806	0.278	1.3	1.93
5	0.36	0.158	0.295	0.696	0.737	0.73	0.533	0.529	0.65	1.32	0.824	1.14	0.898	0.727	0.118	1.66	0.362	0.493	0.789	0.297	0.943	1.73
6	0.557	0.282	0.416	1.08	1.04	1.03	0.705	0.711	0.873	1.68	1.18	1.49	1.21	1.09	0.161	2.59	0.513	0.651	0.929	0.307	1.19	2.48
7	0.559	0.215	0.388	0.74	0.8	0.792	0.623	0.597	0.639	2	1.14	1.79	0.403	0.825	0.135	1.97	0.575	0.541	1.07	0.206	1.34	1.7
8	0.702	0.219	0.549	0.877	0.956	0.934	0.693	0.675	0.81	1.88	1.29	1.66	1.3	0.918	0.158	2.02	0.632	0.633	1.24	0.246	1.33	2.1
9	0.652	0.157	0.194	0.236	0.263	0.262	0.224	0.207	0.199	0.884	0.402	0.769	0.625	0.276	0.0454	0.51	0.466	0.168	0.452	0.0633	0.529	0.522
10	0.543	0.203	0.269	0.556	0.638	0.651	0.541	0.511	0.51	2.81	1.28	2.63	2.21	0.655	0.115	1.13	0.5	0.388	1.01	0.151	1.19	1.13
11	0.767	0.398	0.517	0.958	1.18	1.15	0.851	0.844	0.946	4	1.71	3.56	3.26	1.09	0.197	1.73	0.732	0.766	1.47	0.319	1.63	1.96
12	0.733	0.34	0.34	0.727	0.853	0.819	0.677	0.642	0.675	3.36	1.49	3.27	2.89	0.817	0.147	1.43	0.686	0.562	1.26	0.202	1.42	1.49
13	0.706	0.262	0.31	0.566	0.635	0.638	0.506	0.492	0.501	2.89	1.22	2.66	2.31	0.643	0.114	1.08	0.6	0.419	1.02	0.149	1.18	1.15
15	0.359	0.201	0.324	0.603	0.657	0.606	0.491	0.473	0.505	2.49	1.31	2.24	2.04	0.651	0.106	1.21	0.404	0.38	0.856	0.149	1.21	1.22
17	0.24	0.137	0.268	0.558	0.574	0.571	0.498	0.475	0.436	3.6	1.59	3.34	2.94	0.672	0.11	1.06	0.392	0.34	1.1	0.115	1.33	1
18	0.211	0.154	0.248	0.551	0.567	0.558	0.471	0.459	0.432	3.48	1.4	3.23	2.8	0.649	0.107	0.995	0.345	0.34	1.11	0.115	1.23	0.948
19	0.25	0.139	0.283	0.592	0.585	0.546	0.542	0.511	0.451	4.82	1.96	4.51	3.81	0.735	0.116	1.01	0.419	0.378	1.39	0.118	1.5	0.993
20	0.257	0.112	0.264	0.659	0.666	0.673	0.596	0.547	0.511	4.45	2.08	4.09	3.62	0.761	0.119	1.21	0.423	0.407	1.38	0.161	1.58	1.13
21	0.258	0.145	0.247	0.613	0.636	0.63	0.563	0.557	0.41	3.32	1.64	3.13	2.89	0.811	0.154	0.996	0.373	0.367	1.09	0.12	1.22	0.99
22	0.169	0.0958	0.211	0.434	0.471	0.456	0.441	0.404	0.347	3.43	1.46	3.2	2.76	0.562	0.0887	0.797	0.298	0.302	1.08	0.0939	1.17	0.806
23	0.184	0.0792	0.203	0.482	0.483	0.428	0.426	0.405	0.348	4.33	1.8	4.09	3.78	0.575	0.0896	0.858	0.325	0.279	1.32	0.0939	1.35	0.836
24	0.106	0.0413	0.0941	0.183	0.156	0.143	0.192	0.183	0.114	3.27	1.13	2.93	2.43	0.25	0.031	0.292	0.197	0.0845	0.964	0.0369	0.853	0.336
25	0.134	0.058	0.153	0.317	0.295	0.254	0.289	0.277	0.205	4.44	1.48	3.96	3.2	0.396	0.0585	0.503	0.253	0.144	1.41	0.0463	1.21	0.519

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Sample ID(s)	PAHs as mg/kg dry weight																			
	Acenaphthene	Acenaphthylene	**Anthracene**	**Benz[a]anthracene**	**Benzo[a]pyrene**	Benzo[b]fluoranthene	**Benzo[g,h,i]perylene**	Benzo[e]pyrene	Benzo[k]fluoranthene	C1-Napthalenes	C1-Phenanthrenes	C2-Napthalenes	C3-Napthalenes	**Chrysene**	Dibenz[a,h]anthracene	**Fluoranthene**	Fluorene	**Indeno[123-c,d]pyrene**	Napthalene	Perylene	**Phenanthrene**	**Pyrene**
14	0.205	0.148	0.23	0.467	0.512	0.503	0.472	0.429	0.433	2.72	1.37	2.42	2.07	0.625	0.0823	1	0.312	0.323	0.935	0.111	1.16	0.965
16	0.428	0.635	0.581	0.713	0.773	0.736	0.648	0.597	0.61	4.36	2.13	3.61	2.62	0.861	0.128	1.4	0.902	0.499	1.46	0.161	2.39	1.64
26	0.0805	0.04	0.15	0.33	0.323	0.267	0.232	0.232	0.252	1.74	0.83	1.51	1.26	0.375	0.0519	0.623	0.145	0.178	0.593	0.0632	0.786	0.578
27	0.005	0.005	0.005	0.00892	0.00812	0.00745	0.00929	0.00867	0.00671	0.128	0.0471	0.112	0.0856	0.0119	0.005	0.0177	0.00852	0.005	0.0419	0.005	0.0379	0.0194
28	0.0493	0.019	0.0293	0.0647	0.0514	0.0459	0.0623	0.0689	0.0324	2.07	0.706	1.81	1.44	0.104	0.0112	0.107	0.107	0.0148	0.611	0.005	0.545	0.128
29	0.218	0.0908	0.257	0.512	0.469	0.388	0.48	0.465	0.329	8.08	3.19	6.91	5.81	0.667	0.086	0.955	0.461	0.223	2.62	0.0707	2.32	0.97
30	0.219	0.102	0.266	0.631	0.609	0.596	0.57	0.526	0.495	4.34	1.99	3.95	3.52	0.787	0.0979	1.5	0.393	0.39	1.35	0.12	1.82	1.3
31	0.292	0.106	0.372	0.67	0.563	0.555	0.508	0.482	0.475	3.5	1.8	3.24	2.89	0.782	0.101	1.94	0.478	0.357	1.22	0.117	1.79	1.48

Sample ID(s)	PCBs as mg/kg dry weight																							
	2,2',4,5,5'-Pentachlorobiphenyl	2,3,3',4,4'-Pentachlorobiphenyl	2,3,3',4',6-Pentachlorobiphenyl	**2,3',4,4',5-Pentachlorobiphenyl**	2,2',3,3',4,4'-Hexachlorobiphenyl	**2,2',3,4,4',5'-Hexachlorobiphenyl**	2,2',3,4,5,5'-Hexachlorobiphenyl	2,2',3,4',5',6-Hexachlorobiphenyl	2,2',3,5,5',6-Hexachlorobiphenyl	**2,2',4,4',5,5'-Hexachlorobiphenyl**	2,3,3',4,4',5-Hexachlorobiphenyl	2,3,3',4,4',6-Hexachlorobiphenyl	2,2',3,3',4,4',5-Heptachlorobiphenyl	2,2',5-Trichlorobiphenyl	**2,2',3,4,4',5,5'-Heptachlorobiphenyl**	2,2',3,4,4',5',6-Heptachlorobiphenyl	2,2',3,4,4',5,5',6-Heptachlorobiphenyl	2,2',3,4',5,5',6-Heptachlorobiphenyl	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	**2,4,4'-Trichlorobiphenyl**	2,4',5-Trichlorobiphenyl	2,2',3,5'-Tetrachlorobiphenyl	2,2',4,4'-Tetrachlorobiphenyl	2,2',4,5'-Tetrachlorobiphenyl	**2,2',5,5'-Tetrachlorobiphenyl**	2,3',4,4'-Tetrachlorobiphenyl
	CB101	CB105	CB110	CB118	CB128	CB138	CB141	CB149	CB151	CB153	CB156	CB158	CB170	CB18	CB180	CB183	CB187	CB194	CB28	CB31	CB44	CB47	CB49	CB52	CB66
1	0.00059	0.00016	0.00055	0.00068	0.00013	0.00106	0.00022	0.0011	0.00039	0.00138	0.00008	0.00019	0.00057	0.00017	0.00154	0.00038	0.00107	0.00052	0.00043	0.00035	0.00031	0.00013	0.00028	0.00038	0.00046
2	0.00056	0.00021	0.00061	0.00053	0.00009	0.00086	0.00018	0.00108	0.00052	0.00138	0.00012	0.00016	0.00058	0.00019	0.00179	0.00031	0.00139	0.00053	0.00045	0.00038	0.00034	0.00014	0.00033	0.00042	0.0005
3	0.00071	0.00025	0.00072	0.00072	0.00023	0.00077	0.00023	0.00123	0.00051	0.00162	0.00011	0.00012	0.00056	0.00025	0.00181	0.00033	0.00118	0.00063	0.00057	0.00044	0.00039	0.00017	0.0004	0.00059	0.00057
4	0.00106	0.0003	0.00095	0.00107	0.00019	0.00096	0.00017	0.0012	0.0004	0.00158	0.00014	0.00016	0.00047	0.00031	0.00131	0.00038	0.00099	0.00044	0.00069	0.00055	0.00047	0.00023	0.00054	0.00073	0.00072
17	0.00052	0.00022	0.00056	0.00062	0.00014	0.00048	0.00015	0.00049	0.00018	0.00081	0.00008	<0.00008	0.00015	0.00016	0.00037	0.00009	0.00031	0.00012	0.00041	0.00036	0.00025	0.0001	0.00025	0.00036	0.0004
18	0.00069	0.00026	0.00073	0.00092	0.00013	0.001	0.0001	0.00065	0.00016	0.00093	0.00012	0.00016	0.00017	0.00016	0.00036	0.00016	0.00025	0.00014	0.00038	0.00034	0.00026	0.0001	0.00028	0.00039	0.00049
19	0.00055	0.00019	0.00058	0.00074	0.00012	0.0004	0.00014	0.00056	0.00014	0.00067	0.00011	<0.00008	0.00022	0.00019	0.00046	0.0001	0.00028	0.00012	0.00044	0.00031	0.00024	0.00011	0.00024	0.00039	0.0004
20	0.00064	0.00026	0.00074	0.00082	0.00019	0.00068	0.00019	0.00061	0.0002	0.00083	0.0001	0.00012	0.0002	0.00022	0.00046	0.0001	0.00031	0.00012	0.00052	0.00044	0.00029	0.00009	0.0003	0.00041	0.00051

Sample ID(s)	PCBs as mg/kg dry weight																						
	2,2',4,5,5'-Pentachlorobiphenyl	2,3,3',4,4'-Pentachlorobiphenyl	2,3,3',4',6-Pentachlorobiphenyl	**2,3',4,4',5-Pentachlorobiphenyl**	2,2',3,3',4,4'-Hexachlorobiphenyl	**2,2',3,4,4',5'-Hexachlorobiphenyl**	2,2',3,4,5,5'-Hexachlorobiphenyl	2,2',3,4',5',6-Hexachlorobiphenyl	2,2',3,5,5',6-Hexachlorobiphenyl	**2,2',4,4',5,5'-Hexachlorobiphenyl**	2,3,3',4,4',5-Hexachlorobiphenyl	2,3,3',4,4',6-Hexachlorobiphenyl	2,2',3,3',4,4',5-Heptachlorobiphenyl	2,2',5-Trichlorobiphenyl	**2,2',3,4,4',5,5'-Heptachlorobiphenyl**	2,2',3,4,4',5',6-Heptachlorobiphenyl	2,2',3,4',5,5',6-Heptachlorobiphenyl	2,2',3,3',4,4',5,5',6-Octachlorobiphenyl	**2,4,4'-Trichlorobiphenyl**	2,4',5-Trichlorobiphenyl	2,2',3,5'-Tetrachlorobiphenyl	2,2',4,4'-Tetrachlorobiphenyl	2,2',4,5'-Tetrachlorobiphenyl	**2,2',5,5'-Tetrachlorobiphenyl**	2,3',4,4'-Tetrachlorobiphenyl
	CB101	CB105	CB110	**CB118**	CB128	**CB138**	CB141	CB149	CB151	**CB153**	CB156	CB158	CB170	CB18	**CB180**	CB183	CB187	CB194	**CB28**	CB31	CB44	CB47	CB49	**CB52**	CB66
16	0.00087	0.00033	0.00086	0.00093	0.00015	0.00104	0.00012	0.00076	0.00027	0.00116	<LOD	0.00013	0.00024	0.00032	0.00065	0.00012	0.00049	0.00017	0.00072	0.00051	0.00042	0.00015	0.00043	0.00057	0.00058
29	0.00035	0.00013	0.00044	0.00028	0.00009	0.00028	0.00008	0.00027	<LOD	0.00047	<LOD	0.0001	0.0001	0.00014	0.00022	<LOD	0.00016	<LOD	0.00025	0.00024	0.00018	<LOD	0.00015	0.00027	0.00021

Sample ID	Organochlorines as mg/kg dry weight							
	alpha-hexachlorocyclohexane (AHCH)	beta-hexachlorocyclohexane (BHCH)	gamma-hexachlorocyclohexane (GHCH)	Dieldrin	Hexachlorobenzene (HCB)	1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	Dichlorodiphenyltrichloroethane (PPDDT)	1,1-dichloro-2,2-bis(p-chlorophenyl)ethane (PPTDE)
1	<LOD	<LOD	<LOD	0.001	0.0006	0.0014	0.0006	0.0008
2	<LOD	<LOD	<LOD	0.0016	0.0006	0.0016	0.0008	0.0009
3	<LOD	<LOD	<LOD	<LOD	0.0009	0.0018	0.0017	0.0011
4	<LOD	<LOD	0.00012	<LOD	0.0011	0.0018	<LOD	0.0012
17	<LOD	<LOD	<LOD	<LOD	0.001	0.0009	<LOD	0.001
18	<LOD	<LOD	0.0001	<LOD	0.001	0.0009	<LOD	0.0011
19	<LOD	<LOD	<LOD	0.0001	0.0012	0.0009	<LOD	0.0009
20	<LOD	<LOD	0.0001	<LOD	0.0011	0.001	<LOD	0.0012

Sample ID	Organochlorines as mg/kg dry weight							
	alpha-hexachlorocyclohexane (AHCH)	beta-hexachlorocyclohexane (BHCH)	gamma-hexachlorocyclohexane (GHCH)	Dieldrin	Hexachlorobenzene (HCB)	1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene (PPDDE)	Dichlorodiphenyltrichloroethane (PPDDT)	1,1-dichloro-2,2-bis(p-chlorophenyl)ethane (PPTDE)
16	<LOD	<LOD	0.0002	0.0006	0.0015	0.0012	<LOD	0.0011
29	<LOD	<LOD	0.0001	<LOD	0.0005	0.0006	<LOD	0.0009

Royal HaskoningDHV

Sample ID	Brominated flame retardants as mg/kg dry weight											
	2,2',4,4',6-penta-bromodiphenyl ether (BDE100)	Hexabromodiphenyl ether (BDE138)	2,2',4,4',5,5'-hexa-bromodiphenyl ether (BDE153)	2,2',4,4',5,6'-hexa-bromodiphenyl ether (BDE154)	2,2´,4-tri-bromodiphenylether (BDE17)	2,2',3,4,4',5',6-heptabromodiphenyl ether (BDE183)	2,2',3,3',4,4',5,5',6,6'-decabrominated diphenyl ether (BDE 209)	2,4,4'-tribromodiphenyl ether (BDE28)	2,2',4,4'-Tetrabromodiphenyl ether (BDE47)	2,3',4,4'-Tetrabromodiphenyl ether (BDE66)	2,2',3,4,4'-Pentabromodiphenyl ether (BDE85)	2,2',4,4',5-pentabromodiphenyl ether (BDE99)
1	0.00031	<LOD	0.00063	0.00039	<LOD	0.00223	0.2301	<LOD	0.00102	<LOD	<LOD	0.00091
2	0.00031	<LOD	0.00042	0.00025	<LOD	0.00107	0.2379	<LOD	0.00105	<LOD	<LOD	0.00097
3	0.0003	<LOD	0.00037	<LOD	<LOD	0.00054	0.2511	<LOD	0.00117	<LOD	<LOD	0.00068
4	0.00036	<LOD	0.00037	0.00032	<LOD	0.00052	0.2237	0.00029	0.00172	<LOD	<LOD	0.00104
5	0.00049	<LOD	0.00052	0.00047	0.00032	0.00181	0.3367	0.00031	0.00183	<LOD	<LOD	0.00144
6	0.00039	<LOD	0.00033	0.00028	0.00032	0.00055	0.2168	0.00033	0.00188	<LOD	<LOD	0.00117
7	0.00083	<LOD	0.00049	0.00037	<LOD	0.00066	0.1385	0.00029	0.00283	<LOD	<LOD	0.00278
8	0.00028	<LOD	0.0003	0.00033	0.00034	0.00101	0.2136	0.00029	0.00164	<LOD	<LOD	0.00159
9	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0229	<LOD	0.00053	<LOD	<LOD	0.00043
10	0.00046	<LOD	0.00034	0.00028	0.00026	0.00033	0.068	0.00036	0.00218	<LOD	<LOD	0.00168
11	0.00127	0.00034	0.00113	0.00082	0.00099	0.00069	0.1394	0.00127	0.00597	0.00123	0.00041	0.00602
12	0.00049	<LOD	0.00043	0.00033	0.00043	0.00046	0.1281	0.00055	0.00267	0.00051	<LOD	0.00198
13	0.00048	<LOD	0.00039	0.00033	0.00041	0.00034	0.0923	0.0005	0.00215	0.00035	<LOD	0.00191
15	<LOD	<LOD	0.00032	<LOD	0.00029	0.00029	0.0508	0.00037	0.00176	0.00037	<LOD	0.00149
17	0.00036	<LOD	0.0005	0.0003	<LOD	0.00172	0.0626	<LOD	0.00162	<LOD	<LOD	0.00132
18	0.00039	<LOD	0.00032	<LOD	<LOD	0.00026	0.0552	<LOD	0.00176	<LOD	<LOD	0.00161
19	0.0004	<LOD	0.00032	0.00029	<LOD	0.00026	0.0475	<LOD	0.00168	<LOD	<LOD	0.00142
20	0.00092	<LOD	0.00078	0.00058	0.00036	0.00047	0.0554	0.00063	0.00442	0.00065	<LOD	0.00433
21	0.00045	<LOD	0.00033	0.00026	<LOD	0.00028	0.2936	<LOD	0.00186	<LOD	<LOD	0.00205
22	0.00043	<LOD	0.00036	0.00031	<LOD	0.00048	0.0413	<LOD	0.00182	<LOD	<LOD	0.00164
23	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0733	<LOD	0.00087	<LOD	<LOD	0.00081
24	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.035	<LOD	0.0004	<LOD	<LOD	0.00035
25	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0065	<LOD	0.00029	<LOD	<LOD	<LOD

Sample ID	Brominated flame retardants as mg/kg dry weight											
	2,2',4,4',6-penta-bromodiphenyl ether (BDE100)	Hexabromodiphenyl ether (BDE138)	2,2',4,4',5,5'-hexa-bromodiphenyl ether (BDE153)	2,2',4,4',5,6'-hexa-bromodiphenyl ether (BDE154)	2,2´,4-tri-bromodiphenylether (BDE17)	2,2',3,4,4',5',6-heptabromodiphenyl ether (BDE183)	2,2',3,3',4,4',5,5',6,6'-decabrominated diphenyl ether (BDE 209)	2,4,4'-tribromodiphenyl ether (BDE28)	2,2',4,4'-Tetrabromodiphenyl ether (BDE47)	2,3',4,4'-Tetrabromodiphenyl ether (BDE66)	2,2',3,4,4'-Pentabromodiphenyl ether (BDE85)	2,2',4,4',5-pentabromodiphenyl ether (BDE99)
14	0.00026	<LOD	0.00039	0.00026	<LOD	0.00029	0.1198	0.00026	0.00186	0.00028	<LOD	0.0014

16	0.00093	<LOD	0.00131	0.00089	0.00063	0.00052	0.0999	0.00082	0.00655	0.00082	<LOD	0.00588
26	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0711	<LOD	0.00039	<LOD	<LOD	0.00039
27	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0016	<LOD	<LOD	<LOD	<LOD	<LOD
28	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0008	<LOD	<LOD	<LOD	<LOD	<LOD
29	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0251	<LOD	0.00076	<LOD	<LOD	0.00058
30	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0492	<LOD	0.0011	<LOD	<LOD	0.00093
31	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.0557	<LOD	0.00123	<LOD	<LOD	0.00104

Appendix F – Cefas advice on Year 9 samples

Marine Management Organisation

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Mr Andrew Ridley
PD Teesport Limited
Craft Depot
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TS2 1LX
andrew.ridley@pdports.co.uk
[By email only]

Your reference: L/2015/00427/7
Our reference: MLA/2015/00088/6

31 January 2025

Dear Mr Ridley,

L/2015/00427/7 Mid Licence Sediment Sampling Review – Condition 5.2.3

The Marine Management Organisation (MMO) received a submission to the above on 12 November 2024. The MMO has reviewed the reports (MMO_Results_Template - MAR02481 V2 & MMO Results Template MAR02499 V2, L/2015/00427/7.2) along with our advisors Centre for Fisheries and Aquaculture Science (Cefas). The reports were submitted in response to the following marine licence condition:

Condition 5.2.3:

A regime of future sediment sampling is undertaken by PD Teesport, of at least three yearly intervals, which must be agreed in advance with the MMO. Samples must be collected, analysed and the report of their notification signed off prior to dredging in the fourth and subsequently the seventh and tenth year of this licence.

Reason: *To ensure only suitable material disposed of at sea.*

Condition 5.2.9:

If disposal of more than 1 million tonnes wet weight is required at Tees Bay A (TY160) in 2022, 2023 or 2024, then additional sediment sampling requirements must be agreed with the MMO. Agreed sample results must be submitted to and approval given in writing by the MMO prior to disposal of material above 1 million tonnes wet weight per annum.

Reason: *To ensure only suitable material is disposed of at sea and that the works continue to meet UK OSPAR requirements*.

After full review of the reports and advice received from CEFAS, the MMO has the following comments to make:

Comments for Action

Please ensure all information submitted under SAM/2024/00054 meets UK signatory obligations for OSPAR & LC/LP annual dredge & disposal returns. This includes ensuring the following corrections are undertaken:

- Fully complete application information tabs on all relevant sampling results to ensure it reflects the correct name (as per sampling plan), sampling depth, application number, sampling location.
- Amend all sample co-ordinates so that they are in decimal degrees (WGS84)

PDBE Sample Results

PBDE sampling indicates that BDE209, 99 and 100 are higher than recommendations as per Mason et al (2022). They are higher than their lower assessment criteria (LAC) but lower than the Higher assessment criteria (HAC) in 16, nine, five and one sample sites respectively. As there is no Total Organic Carbon (TOC) provided there is no way to normalise the PBDE results provided. If they TOC is above 2.5% the levels would be reduced. Historically it has been noted by CEFAS that they are greater than 3% therefore there is risk may be lower than what is observed. The MMO are concerned with the levels shown from PBDEs. See figures 1 and 2 below.

Due to the increases observed in BDE99 and BDE209 since 2023 the MMO would request the addition of a licence condition to include the sampling of the dredge material for PBDEs in a year to monitor that levels remain at levels previously observed and are not increasing. This is to ensure the material can continue to be disposed of to sea. The MMO reques that the analysis of TOC is also undertaken with these analyses, to be able to understand the availability of the contaminant and evidence perceived risk. This will be factored into a renewal of the current licence if submitted.

Further information on the PBDE analysis, and a full review of analysis sent to the MMO can be found in the annex of this letter

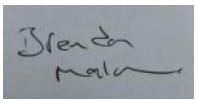
Conclusion

The MMO is content that the reports are sufficient to discharge 5.2.3 and 5.2.9 of marine licence L/2015/00427/7.

However due to the increases observed in BDE99 and BDE209 since 2023 it has been advised for the addition of a licence condition to include the sampling of the dredge material for PBDEs in a year to monitor that levels remain at levels previously observed and are not increasing. This is to ensure the material can continue to be disposed of to sea. It is also advised the analysis of TOC is also undertaken with these analyses, to be able to understand the availability of the contaminant and evidence perceived risk.

If you require any further information please do not hesitate to contact me using the details provided below.

Yours Sincerely,



Brendan Malone
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Annex 1

Particle Size Analysis

The PSA indicates that sediment composition is predominantly composed of silt / clay (69% - 98%) followed by sand (1% - 31%) and little to no gravel (0% - 2%) excluding samples 24 (Chart 9) and 25 (Chart 10) which were both predominantly composed of sand (64%) followed by silt / clay (36%) with little to no gravel. This composition is in line with the current licence material type.

Trace metals

Analysis of all trace metals (including arsenic) showed levels greater than Cefas Action Level 1 (AL1) in multiple samples but none were greater than Cefas Action Level 2 (AL2) in any sample. All levels of trace metals above AL1 were closer to the AL1 threshold than to their respective AL2. Levels below AL1 were also observed for all trace metals across multiple samples. The material in respect to trace metals is considered acceptable for continued disposal to sea, in this case to Tees Bay A (TY160) disposal site.

Organotins

All levels of DBT and TBT were below AL1 with the majority below the limit of their detection (LOD). Only six samples (5, 6, 8, 11, 13, 16) contained levels above the LOD but below AL1 for DBT, whilst this was the case for nine samples (3, 4, 5, 6, 8, 11, 12, 13, 16) for TBT. Therefore the material in respect to organotins is considered acceptable for continued disposal to sea, in this case to Tees Bay A (TY160) disposal site.

Polycyclic Aromatic Hydrocarbons

In the absence of a defined AL2 for PAHs, Cefas utilise the Gorham-Test approach (Gorham *et al*., 1999; Long *et al*., 1995; 1998). This is an effects-range approach which considers the sum total of a number of the low molecular weight (LMW) PAH analytes which are seen as acutely toxic, and a selection of the high molecular weight (HMW) PAH's that are considered to be more long term acting (i.e. carcinogenic) which are compared for each sample for two effects ranges. Total values of the LMW PAHs and the total of the HMW PAHs are calculated and then compared to threshold values. If a total value (for either LMW or HMW selection of PAHs) does not exceed the effects-range low (ERL), the indication is that the sediment in the sample can be considered low risk. If a total value exceeds the effects-range median (ERM) for either the LMW or the HMW total values, it can be considered higher risk, with more likelihood of harm occurring. The LMW and HMW levels are displayed in Figures 2 and 3 below.

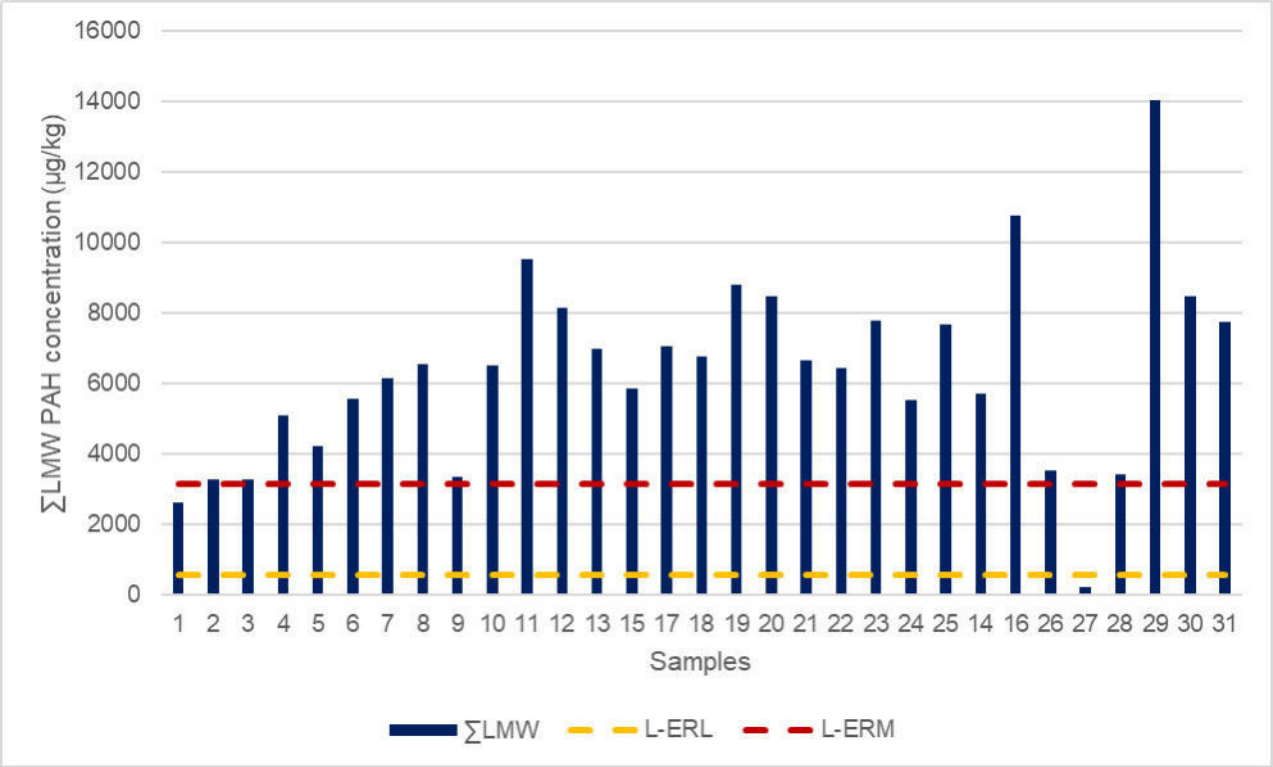

Figure 2: LMW PAH levels detected in Tees and Hartlepool in 2024 (obtained from documents cited in paragraphs seven and eight).

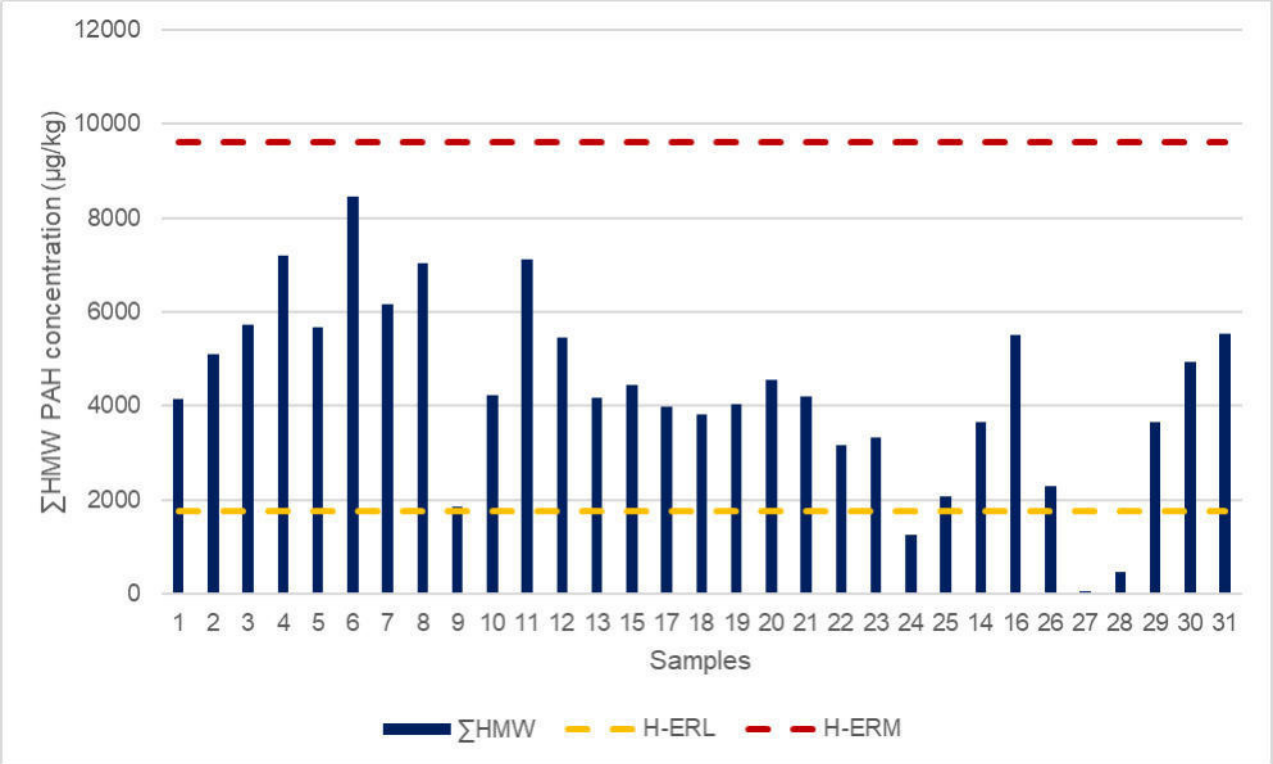

Figure 3: HMW PAH levels detected in Tees and Hartlepool in 2024 (obtained from documents cited in paragraphs seven and eight).

Out of the 31 samples analysed for PAHs 29 were greater than the LMW ERM ranging from around the ERL threshold (3,160 µg/kg) to 4.4x the ERM threshold (14,047 µg/kg). The remaining two samples were 1 (Figure 1 Exolum Riverside) and 27 (Figure 1 Chart 12); sample 1 contained LMW PAH levels greater than ERL but close to the ERM threshold whilst sample 27 contained levels of LMW PAHs less than ERL. Only one sample, sample 6 (Figure 1 Chart 3), was close to, but below, the ERM threshold for HMW PAHs. All remaining levels of HMW PAHs were below the ERM except for three samples which were below the ERL. The three samples below ERL were sample 24 (Figure 1 Chart 9), sample 27 (Figure 1 Chart 12) and sample 28 (Figure 1 Hartlepool Channel). Of note is that sample 27 is the only sample to contain levels of both LMW and HMW PAHs below their respective ERLs.

The levels of LMW PAHs alone would normally preclude the material from continued disposal to sea due to levels that would pose a risk to the marine environment, however, the river Tees is historically an area that exhibits PAH levels higher than other UK rivers due to industrial sources and history of the river (Nicolaus *et al*., 2015; Kirby *et al*., 1999), especially acute LMW PAHs. This has been evident throughout the current licence whereby both LMW and HMW levels detected in sediment sampling and analysis since 2015 have shown elevated levels of LMW and HMW PAHs that are greater than their respective ERLs and ERMs (documents cited in paragraphs nine and ten). It is prudent to compare the current results to historical levels detected within the duration of the licence so that local and regional context of these results are considered; these are visualised in Figures 4 and 5 below.

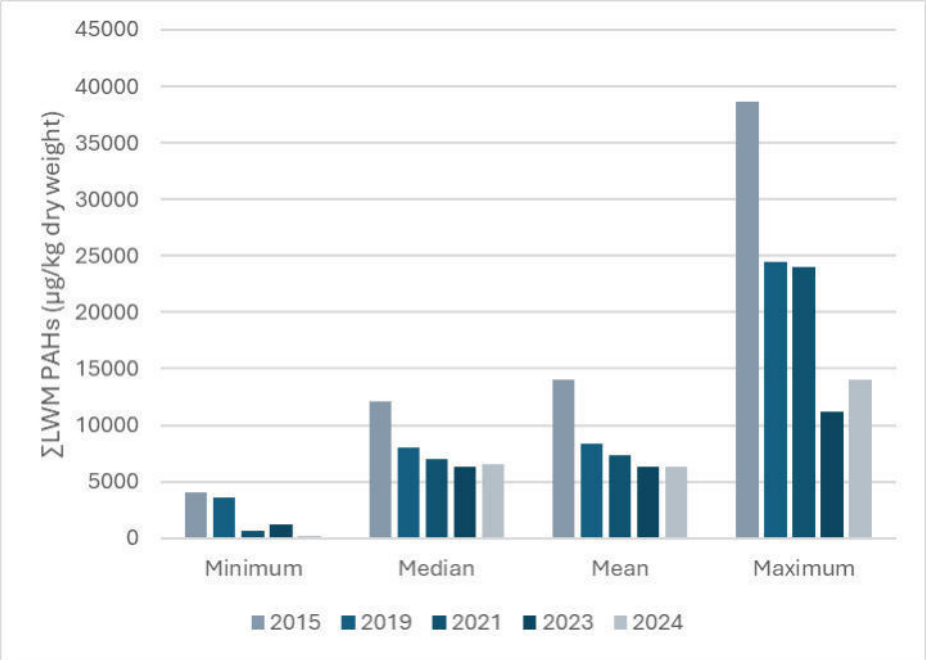

Figure 4: LMW PAH comparison within Tees and Hartlepool from 2015 – 2024.

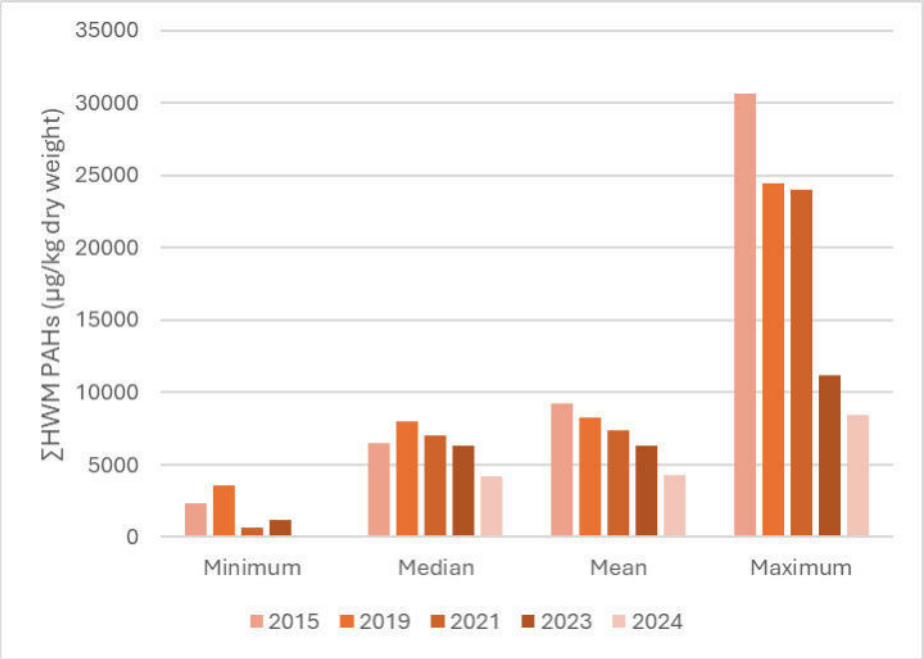

Figure 5: LMW PAH comparison within Tees and Hartlepool from 2015 – 2025.

It is observed that levels of LMW PAHs have maintained a similar level since 2023; the minimum value is less than 2023, the median and mean are of a similar value to 2023 but the maximum has increased since 2023. Viewing the levels of LMW PAHs since the start of the licence in 2015 indicates that they have continued to drop over the years with the Tees and Hartlepool dredge area. Interpretation of the HMW PAH levels is more clear cut with all factors (min, median, mean and max) all decreasing in value since 2015, and in broader terms all seeing a decrease every year since 2019.

Considering these results holistically; in both the local context of the river Tees and in comparison, to previous mid-licence data, the PAH results alone do not preclude material from continued disposal to sea, in this case to Tees Bay A (TY160) disposal site.

Polychlorinated biphenyls

In total ten samples were analysed for PCBs, in-line with recommendations under SAM/2024/00054 (document cited in paragraph nine). Samples selected for PCB analysis were 1 (Figure 1 Exolum Riverside), 2 (Figure 1 Chart 1), 3 (Figure 1 Bamletts Bight), 4 (Figure 1 Chart 2), 16 (Figure 1 Navigator North Tees), 17 (Figure 1 Mid Channel), 18 (Figure 1 Exolum Seal Sands), 19 (Figure 1 Chart 8), 20 (Figure 1 Phillips Terminal) and 29 (Figure 1 Hartlepool Berths); these are representative of the area to be dredged and acceptable given that SAM/2024/00054 stated that PCB analysis "*must include a sample collected from Chart sectors 1 & 2 (Figure 1)*". PCB analysis revealed all samples contained levels of ICES 7 and Total 25 PCB congeners less than AL1. In the absence of an AL2 for ICES 7 PCB congeners the observed levels have been compared to German Action Levels (deALs) for further investigation; all ICES 7 PCB congeners were less than their respective deAL1. The material in respect to PCBs only is acceptable for continued disposal to sea, in this case to Tees Bay A (TY160) disposal site.

Organochlorine pesticides

In total ten samples were analysed for OCs, in-line with recommendations under SAM/2024/00054 (document cited in paragraph nine). Samples selected for OC analysis were 1 (Figure 1 Exolum Riverside), 2 (Figure 1 Chart 1), 3 (Figure 1 Bamletts Bight), 4 (Figure 1 Chart 2), 16 (Figure 1 Navigator North Tees), 17 (Figure 1 Mid Channel), 18 (Figure 1 Exolum Seal Sands), 19 (Figure 1 Chart 8), 20 (Figure 1 Phillips Terminal) and 29 (Figure 1 Hartlepool Berths); these are representative of the area to be dredged and acceptable given that SAM/2024/00054 stated that OC analysis "*must include a sample collected from Chart sector 1 & 8, Navigator North Tees and Hartlepool Berths (Figure 1)*". Only one sample, sample 3, had levels of DDT[1] greater than AL1 whilst all other samples contained levels of DDT and Dieldrin less than their respective AL1. In the absence of an AL2 for DDT and Dieldrin OCs and no agreed ALs for the remaining OCs, the levels have been compared to deALs. This analysis revealed that sample 3 was greater than deAL1 but less than deAL2 for DDT. Levels of DDE[2] are greater than deAL1 but less than deAL2 in five samples (1, 2, 3, 4 and 16) whilst all remaining samples observed levels of OCs less than their respective deAL1. The material in respect to OCs only is acceptable for continued disposal to sea, in this case to Tees Bay A (TY160) disposal site.

Polybrominated diphenyl ethers

In the absence of agreed ALs for PBDEs, Cefas use the best available evidence for assessment and therefore refer to the recommendations in Mason *et al*. (2022), however, it should be noted that these recommended guidelines are not formally agreed ALs and their use is therefore advisory. The analysis indicates BDE209[3], BDE99[4] and BDE100[5] at levels greater than their respective higher assessment criteria (HAC) in 23, 19 and one sample sites, respectively. The analysis indicates BDE100, BDE99, BDE209 and BDE85[6] at levels greater than their respective lower assessment criteria (LAC) but less than the HAC in 16, nine, five and one sample sites, respectively. The remaining samples contain PBDE congener levels below their respective LAC. Alongside this, no Total Organic Carbon (TOC) data is available to characterise a sediment sample alongside the PBDE results, and thus I am unable to normalise the PBDE results provided; a nominal value of 2.5% TOC for normalisation has been used for this assessment. However, if values of TOC for the samples are greater than 2.5% the levels would be reduced. TOC Values for the Tees in the past have seen levels greater than 3%, therefore the risk may potentially be lower than the levels observed. The levels for BDE209 and BDE99 are displayed in Figures 6 and 7 below. Overall, the PBDE concentrations alone from across the dredge area raise concern for disposal at sea from risk to the marine environment.

[1] Dichlorodiphenyltrichloroethane
[2] 1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene
[3] 2,2',3,3',4,4',5,5',6,6'-decabrominated diphenyl ether
[4] 2,2',4,4',5-pentabromodiphenyl ether
[5] 2,2′,4,4′,6-penta-bromodiphenyl ether
[6] 2,2',3,4,4'-Pentabromodiphenyl ether

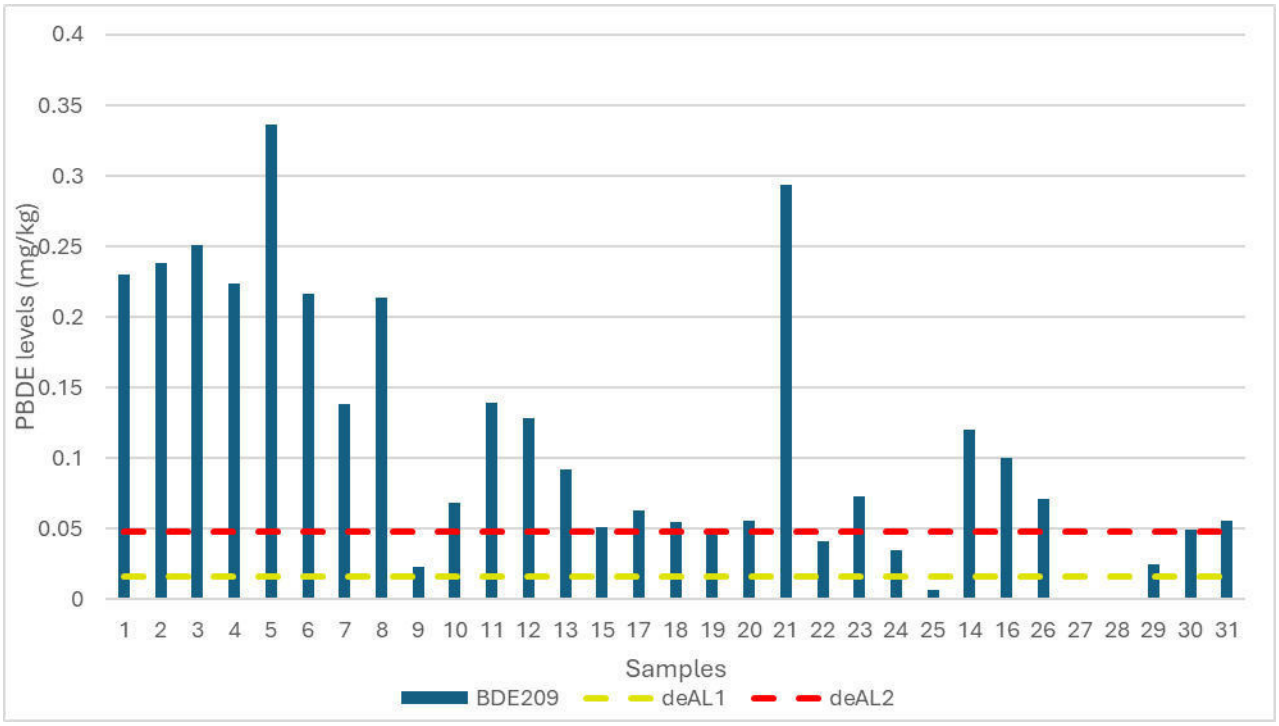

Figure 6: Levels of BDE209 across the Tees and Hartlepool in 2024 (obtained from documents cited in paragraphs seven and eight).

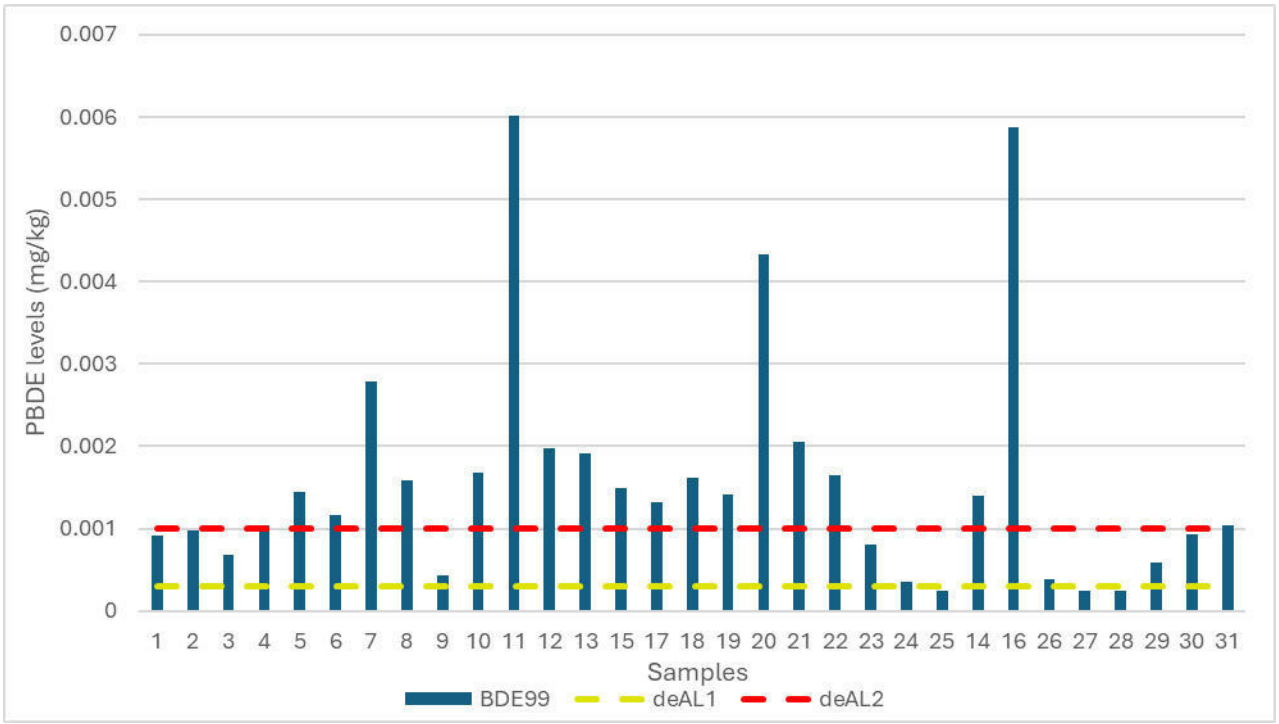

Figure 7: Levels of BDE99 across the Tees and Hartlepool in 2024 (obtained from documents cited in paragraphs seven and eight).

Material in the river Tees are known to exhibit elevated PBDE levels above the LOD due to the historic manufacture of these chemicals in the area (Assunção *et al*., 2020; Boon *et al*., 2002; Law *et al*., 2006) and therefore for a more appropriate assessment the current levels have been compared to historical values taken from across the dredge area throughout the current

marine licence to provide further local and regional context; these are visualised in Figures 8 and 9 below.

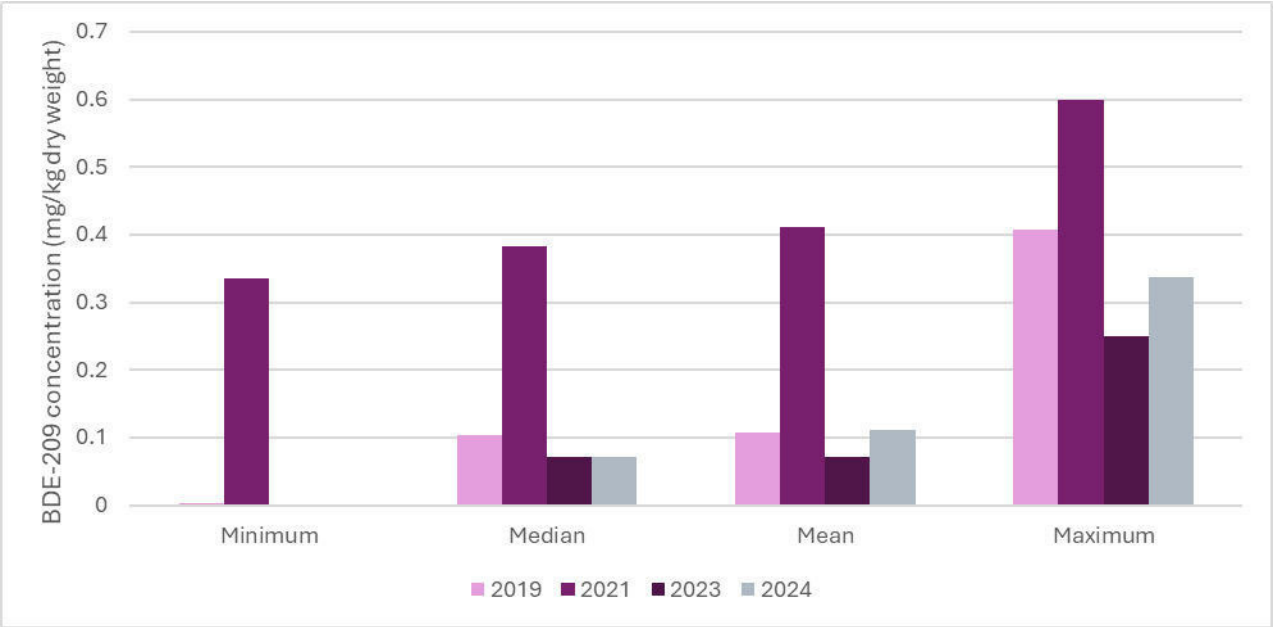

Figure 8: BDE209 comparison within Tees and Hartlepool from 2019 – 2025.

The levels of BDE209, as indicated by Figure 8, have remained similar across the years with the exception of 2021 which were elevated in comparison. Whilst the levels are still concerning it indicates that levels are still within the recorded range.

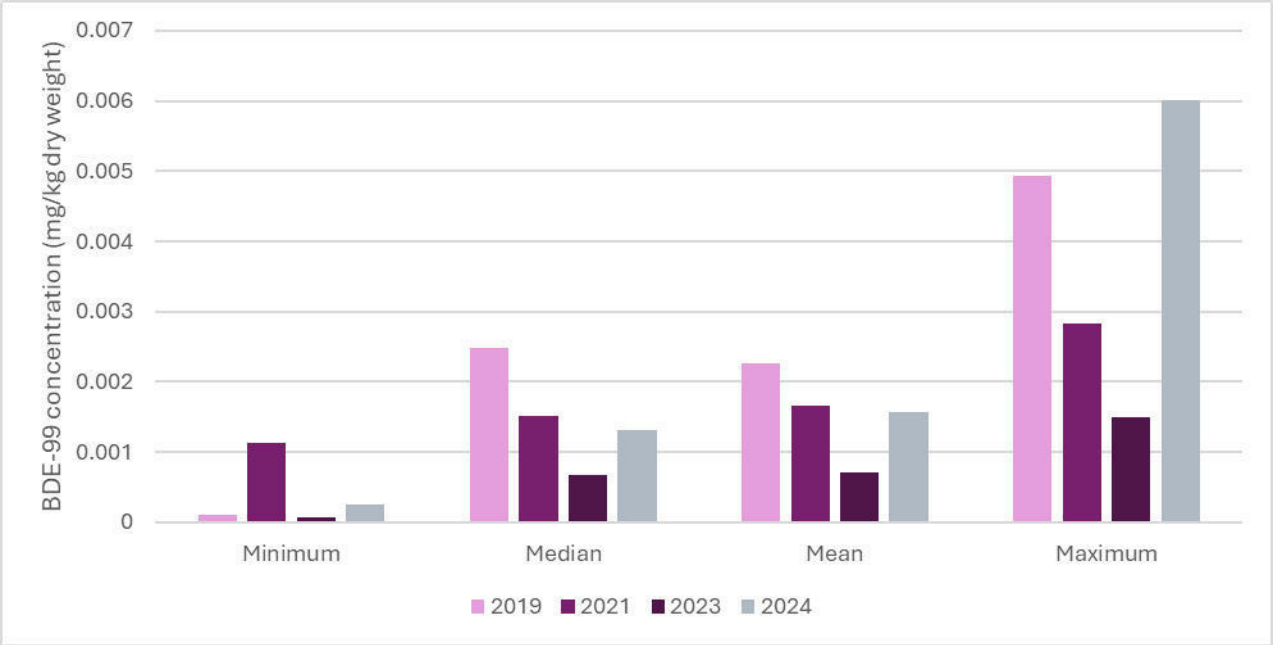

Figure 9: BDE99 comparison within Tees and Hartlepool from 2019 – 2025.

The levels of BDE99, as indicated by Figure 9, on the whole in regards to minimum, maximum, mean and median are in a similar region with the exception of the maximum concentrations observed this year at two sites, Sample 11 (Figure 1 Chart 6; 0.00602 mg/kg) and sample 16 (Figure 1 Navigator North Tees; 0.00588 mg/kg), which have indicated levels higher than

previously noted maximums for samples in the river Tees. Alongside this sample 20 (Figure 1 Phillips Terminal; 0.00433 mg/kg) was observed at levels close to the 2019 maximum. This is concerning and indicates that the levels of BDE99 are higher than previously noted for samples within the river Tees.

It should be noted that the sampling numbers for each year vary for PBDEs and therefore differences could be due to sampling variation e.g. 2023 had ten samples, 2021 had nine whilst 2024 and 2019 had over 30 samples each which will affect averages and thus results are not directly comparable.

Given the above, levels of PBDEs pose a high risk to the marine environment at some sites. Overall, my opinion is that the levels of BDE209 and BDE99 observed in the 2024 data pose a potentially unacceptable risk to the marine environment. However, the levels for all other BDE congeners and other contaminants analysed do not preclude the material from disposal to sea. Given that the levels of BDE209 and BDE99 appear to be lower or generally consistent with the levels observed in previous years (excluding the BDE99 maximum) and given that the elevated presence of PBDEs in the river Tees that can be traced to historic industrial inputs the material whilst of concern may be allowedfor disposal, in this case to Tees Bay A (TY160) disposal site. However, to evidence the impact of the disposal activity with contaminants at these levels it would be prudent to undertake a site-specific monitoring survey to look at impacts in the sediment flora and fauna around the area of the disposal site. I recommend that Tees Bay A (TY160) disposal site and the wider area, is flagged for future monitoring by the MMO.

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Your reference: L/2015/00427/7
Our reference: MLA/2015/00088/6

By email only

01/04/2025

Dear Mr Ridley

L/2015/00427/7 Mid Licence Sediment Sampling Review Resubmission – Condition 5.2.3

The Marine Management Organisation (MMO) received the above on 12 November 2024. The reports were submitted in response to the following marine licence condition:

Condition 5.2.3:
A regime of future sediment sampling is undertaken by PD Teesport, of at least three yearly intervals, which must be agreed in advance with the MMO. Samples must be collected, analysed and the report of their notification signed off prior to dredging in the fourth and subsequently the seventh and tenth year of this licence.

Reason: To ensure only suitable material disposed of at sea.

Condition 5.2.9:

If disposal of more than million tonnes wet weight is required at Tees Bay A (TY160) in 2022, 2023 or 2024, then additional sediment sampling requirements must be agreed with the MMO. Agreed sample results must be submitted to and approval given in writing by the MMO prior to disposal of material above 1 million tonnes wet weight per annum.

Reason: To ensure only suitable material is disposed of at sea and that the works continue to meet UK OSPAR requirements.

It is noted that this is a resubmission of this report but with Total Organic Carbon (TOC) data for normalisation of Polybrominated diphenyl ethers (PBDE) concentrations.

The MMO has reviewed the reports (*MMO_Results_Template - MAR02481 V2 with TOC.xlsm & MMO Results Template MAR02499 V2.xlsm*) along with our advisors Centre for Fisheries and Aquaculture Science (Cefas) and have the following comments to make:

1. In MMO's discharge letter for return 7.2 (see MMO's letter from Brendan Malone to Mr Andrew Ridley dated 31 January 2025), we stated the following, '*due to the increases observed in BDE99 and BDE209 since 2023 it has been advised for the addition of a licence condition to include the sampling of the dredge material for PBDEs in a year to monitor that levels remain at levels previously observed and are not increasing. This is to ensure the material can continue to be disposed of to sea. It is also advised the analysis of TOC is also undertaken with these analyses, to be able to understand the availability of the contaminant and evidence perceived risk'.*

2. The resubmitted sediment sampling and analysis with the addition of TOC, whilst containing levels of contaminants that would normally preclude material from disposal to sea, allows for continued disposal of dredged material to sea, in this case 2,889,700 wet tonnes in 2025 to Tees Bay A (TY160) disposal site. Levels of PBDEs have now decreased since the previous consultation due to TOC normalization. As such, yearly sampling of PBDEs is not required at this time and resampling can be done **in three years** from the date of samples taken.

3. MMO remind the applicant that new sampling will be required for any future Marine Licence applications.

Conclusion

MMO are content the sampling is still compliant with conditions **5.2.3** and **5.2.9.**

If you require any further information, please do not hesitate to contact me using the details provided below.

Yours sincerely,

Conor Goodwin

Marine Licensing Case Officer

Appendix G – Group Environmental Policy and Energy Statement

PD PORTS

Group Environmental & Energy Policy Statement

PD Ports is an established port and logistics business offering marine and port operations, warehousing, transport, forwarding and chartering throughout the UK. We recognise environmental protection and improved energy performance as key components of sound business performance.

We will ensure availability of information and necessary resources to:

- Maintain our certification to ISO 14001 and ISO 50001 and operate as a minimum in compliance with all relevant legal and other requirements applicable to our business.
- Incorporate environmental issues and energy considerations into our decision making and operations, including in design and purchasing activities.
- Train, educate and inform our employees about environmental issues that may affect their work and promote environmental and energy awareness to all those working on our sites.
- Ensure there are adequately trained personnel and suitable equipment available to respond immediately to any environmental / pollution incident and to regularly exercise contingency plans.
- Promote efficient use of resources and reduction of waste throughout our operations including electricity, fuel, raw materials, water, and other resources, particularly those that are non-renewable, thereby reducing our carbon footprint.
- Work with our customers and suppliers to assess opportunities for the use of renewable and alternative energy sources.
- When dealing with any substances, especially hazardous substances, take all reasonable steps to prevent pollution during handling, transportation, storage, and disposal, including developing procedures for dealing with emergencies and spill response in consultation with our neighbours and tenants as appropriate.
- To plan for changing environmental conditions through, amongst other measures, the development and regular review of a climate change mitigation and adaptation plan.
- Minimise the impact of our activities on the local community and communicate proactively on the environment with interested parties, including customers, tenants. Local residents and public authorities.
- Minimise our impact on the ecology and the surrounding environment through the terrestrial and marine planning process. Undertake and regulate marine movements to minimise the impact on the surrounding environment and other stakeholders.
- Strive to continually improve our environment and energy performance by setting and periodically reviewing our environmental objectives and energy targets in light of new legislation and future plans.

Frans Calje, Chief Executive Officer
PD Ports

STRETCH

Appendix H– Marine Licence List

- L/2019/00328/ Granted 03/10/19. Hartlepool approach channel - programme of works within and adjacent to the existing approach channel into Victoria Harbour, located to the immediate south of Hartlepool Headland. Comprises offshore disposal of capital dredged material (required to deepen, realign, widen and extend the length of the existing approach channel), as well as the construction of an underwater retaining wall adjacent to Middleton Breakwater – unlikely to be completed now.

- Licence 33195/06/0 granted 5 September 2006 for 19,800 tonnes of dredged material at Teesside Cast Products (TCP) Heavy Lift Quay completed in 2008 and at Dawson's North Sea Supply Base completed in 2009.

- Licence 32880/06/01 granted 14 September 2006 for 88,000 tonnes of dredged material at Billingham Reach Wharf, Tees Dock Turning Circle, Tees Dock Water Area and Corporation Dock. This work has been completed.

- Licence 32717/08/0 granted 21 May 2008 for the disposal of up to 1,934,836 tonnes of capital dredge material from Seaton Channel, the Holding Basin and Quays 10/11 of the Able (UK) yard. This work has been completed.

- Licence 34371/10/0 granted 4 June 2010 for reconstruction works of an approximately 150m length of half tide embankment in the River Tees. The reconstruction used 45m long sections of geotube filled with suitable dredged material. This work has been completed.

- Licence L/2011/00052/3 granted 1 June 2011 for the dredge and disposal of up to 2,804,000 tonnes of material from River Tees Channel, Berths and Frontages, Hartlepool Channel, docks and water area and Seaton Channel basin and berths. The approved disposal site was Tees Bay A (TY160). This work has been completed.

- Licence L/2013/00217 granted 10 July 2013 for capital dredging and construction to improve Tees Dock No.1 Quay and variation L/2013/00217/7 approved January 2017 for an additional 15,000m^3 of material from within Tees Dock. This work has been completed.

- Licence L/2013/00155 granted 17 May 2013 for capital dredging at Able Middlesbrough Port Berth 1 & 2 to return the depth to previous level (from average 6.3m to 7m). This licence expired on 14 May 2016.

- Licence 34376/09/0 and 34377/09/0 granted 26 October 2009 for the QEII berth development with the deposit of 42,000 tonnes of capital dredged material at disposal site Tees Bay C (TY150). A variation to extend both licences was requested on 20 November 2013, which was issued on 31 December 2013, and therefore licence L/2013/00403 now supersedes Licence 34376/09/0; and Licence L/2013/00404 now supersedes Licence 34377/09/0. Both licences have an end date of 31 December 2016. A subsequent change was then required to transfer the licence holder from PD Ports to MGT Teesside Limited. These varied licences were issued on 24 December 2014 (L/2013/00403/3 and L/2013/00404/3) (with an expiry date of 31 December 2016). Licence L/2013/00404/5 was granted on 27 May 2015 and expired on 31 December 2018.

- Licence 34963/11/0 granted 28 January 2011 for disposal of 3,496 tonnes of dredged material from South Bank, Wharves (TATA) on the River Tees at the disposal site Tees Bay A (TY160).

- Licence L/2011/00335/1 granted 21 December 2011 for works commencing between 1 January 2012 and 31 March 2013 for the placement of a rock mattress to support the spud legs from jack-up barges as part of the loading facilities for offshore wind construction in Hartlepool Docks. This work has been completed.

- Licence L/2014/00014 granted 29 January 2014 for works commencing between 1 April 2014 and 31 October 2014 to undertake refurbishment works to an existing jetty at Simon Storage. No dredging was required as part of the scheme. The work commenced and was completed during 2014.

- Licence L/2014/00227 Completion of Replacement Quay dredging- The aim of the project was to deepen the quay to allow larger vessels to berth. The end date on the licence is 3rd August 2015

- Licence L/2012/00361/3 Tees Transporter Bridge Enhancements - Stockton and Middlesbrough Councils are proposing various works to turn the Tees Transporter Bridge into a sub-regional and national visitor centre and tourist attraction. The application covers installation of permanent piles and pile cap. The end date of the licence is 31st December 2014.

- Licence L/2017/00066 Port Clarence Erosion Protection Works, Environment Agency. This project is needed to stabilise a river bank at Port Clarence, which has become subjected to erosion. This project is required to ensure the effectiveness of the recent flood protection scheme that was constructed at the site in 2015. The end date of the licence is 30th September 2017.

- Licence L/2017/00202 Middlehaven Dock Bridge Construction. Middlesbrough Council applied for a licence to install a three-lane vehicular bridge to replace the pedestrian footbridge at Middlehaven Dock. The licence end date was 30th September 2018.

- Licence L/2015/00233/2 Teesside Renewables Energy Plant – Surface Water Outfall, ECO2 Ltd As part of the Teesside Renewable Energy Plant at Port Clarence, Teesside, a new drainage outfall to the River Tees is required. The end date on the licence was 9th January 2016.

- Licence L/2017/00259 Installation of two piles and a pontoon at Normanby Wharf, Dockside Road Middlesbrough. The end date of the licence is 30th September 2019.

- Licence L/2017/00395 Sabic Dolphin Walkways 3 and 5 Maintenance of existing work, Sabic UK Petrochemicals Ltd. Dolphin structures 3 and 7 (at SABIC North Tees facility) require repair and general remediation. This will include the replacement of a gangway and the sleeving of 3 piles together with general maintenance. The licence end date is 19th October 2018.

- Licence L/2017/00395 Sabic Dolphin Walkways 3 and 7, Sabic UK Petrochemicals Ltd. Repair and general remediation of dolphin structures 3 and 7. Licence end date 19th October 2018.

- Licence L/2017/00194 Demolition and Site clearance of No 1 Jetty at Sabic Petrochemicals UK, North Tees Site, Sabic UK Petrochemicals Ltd. Demolition of SABIC North Tees No. 1 Jetty 1, which is no longer required for operational use at SABIC Quay. Licence end date is 31 December 2017.

- Licence L/2014/00166/3 Dismantling, Demolition of Redundant No. 1 Jetty at Sabic Petrochemicals UK . Jetty 1 is no longer required in order to undertake operations at SABIC quay, therefore this licence is for demolition of Jetty 1. The Licence end date is 31st August 2016.

- Licence L/2018/00179 North Tees Jetty 1A Replacement Ethylene Loading Arm Maintenance of existing works, Sabic Global ltd. The licence end date is 24th April 2019.

- Licence L/2013/00332/1 North Tees Site Jetty 2 embankment repair, Sabic UK Petrochemicals Ltd. The intention of this project is to arrest the decay of the embankment around the loading jetty and partially reprofile it. The licence end date is 14th December 2013.

- Licence L/2012/00094/1 SABIC Quay Marine Licence Application Jetty 3, Sabic UK Petrochemicals Ltd. Maintenance of two jetties at SABIC Quay and demolishment of Jetty 1. The licence end date is 29th March 2013.

- Licence L/2015/00226 Sabic Works at No.3 Jett North Tees, Sabic UK Petrochemicals Ltd. Works include upgraded fire protection system, dismantling and removal of jetty control buildings and construction of jetty impounding basin. The licence end date it 30th September 2016.

- Licence L/2013/00172/1 Tees Overhead Line Removal, National Grid Electricity Transmission PLC. The licence is for removal of the existing overhead line as a new line is required. The licence end date is 31st July 2016.

- Licence L/2013/00082 Environment Agency Intertidal Grab Sampling for Benthic Inverts and Contaminant, Environment Agency. A survey to assess the ecological status of the marine environment under the Water Framework Directive. The licence end date is 7th March 2014.

- Licence L/2013/00217 for the installation of a 30m floating pontoon to the newly refurbished Tees Dock No.1 Quay. The MMO approved a variation request to licence L/2013/00217 on 28 March 2018 (L/2013/00217/8), The MMO also granted permission to extend the expiry date of the licence from 31 March 2018 to 1 September 2018, to allow the pontoon installation works to take place.

- L/2019/00341 South Bank Wharf Site Investigation – Sampling, Able UK Ltd. A programme of sediment sampling was undertaken during 2019 to inform the environmental consenting process for a proposed new port facility at South Bank wharf. The licence end date is 31st December 2019.

- L/2012/00116 Tees Crossing Overhead Power Line Scheme, National Grid Electricity Transmission PLC. The licence is for refurbishment the overhead line across the River Tees. A new overhead line route alignment was proposed. The licence end date is 15th April 2052.

- L/2021/00048/2 Exolum Seal Sands Ltd revetment maintenance and deck works. Exolum Seal Sands Ltd has a marine licence to undertake a programme of maintenance works to its existing revetment, as well as works to locally wide the deck of Jetty 2. No dredging is required as part of the works. The marine licence end date is 31st December 2024.

- Net Zero Teesside Comprises a new build low carbon gas-fired power station, natural gas pipeline, powerlines, water connections, effluent discharge infrastructure, CO2 gathering network, high pressure CO2 compression facilities/ export pipeline, temporary construction and laydown areas and access/highway improvements Applications in No significant marine works proposed therefore no implications identified for the maintenance dredging strategy within the Tees estuary or at Hartlepool.

Previous versions of the maintenance dredge licence

Licence L/2012/00366 granted 28 September 2012 for works commencing between 1 October 2012 and 31 May 2015 for the disposal of dredged material (licensed quantity 2,889,700 tonnes) from River Tees

Channel, Berths and Frontages; Hartlepool Channel and docks and water area; and Seaton Channel basin and berths. The approved disposal site is Tees Bay A (TY160). This marine licence has now been superseded by Licence L2015/00427/1. Licence L/2015/00427/1 was granted 30 December 2015 for maintenance dredging disposal and has been varied a number of times; the latest licence reference is L/2015/00427/6. This is a 10-year licence commencing from 1 January 2016.