Royal HaskoningDHV
Enhancing Society Together

Tees Maintenance Dredging Annual Review 2014

PD Teesport
February 2015

Royal HaskoningDHV

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1 INTRODUCTION

1.1 Rationale

The purpose of this document is to provide an annual review of any changes to PD Teesport's existing maintenance dredging practices, set against a known baseline. Additionally, any new information available in relation to baseline environmental conditions, and information regarding the Teesmouth and Cleveland Coast Special Protection Area (SPA) and Ramsar site and their interest features, is presented where applicable.

The Baseline Document (Royal Haskoning, 2008) was published in February 2008, alongside annual reviews undertaken in November 2009 (Royal Haskoning, 2009a), February 2011 (Royal Haskoning, 2011), March 2012 (Royal Haskoning, 2012a), February 2013 (Royal HaskoningDHV, 2013) and May 2014 (Royal HaskoningDHV, 2014a) and should be read in conjunction with this review. It must be noted that the annual updates are on the reviews themselves, rather than the initial Baseline Document.

The main headings of the review are self-explanatory; however, the sub-headings are intended to cover the various aspects of the Baseline Document that could potentially change. Changes to conclusions reached as a result of new information are provided and the review considers a short discussion relating to any recommendations made.

1.2 Background

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 and followed the draft Protocol issued in 2003 for pilot studies at three trial sites on the Humber, Medina and Fal/Helford.

Where maintenance dredging operations have the potential to affect 'European Sites' around the coast of England (also known as Natura 2000 sites, including Special Areas of Conservation (SAC) and SPAs), the Government considers that maintenance dredging should be considered as a 'plan' or 'project', and assessed in accordance with Article 6(3) of the EC Habitats Directive (92/43/EC) (transposed into UK law by The Conservation of Habitats and Species Regulations 2010 ('Habitats Regulations')). Whilst not endorsing this interpretation, the ports industry has agreed to co-operate with the Government to seek to devise arrangements which allow the effects of maintenance dredging on European sites to be assessed without placing a disproportionate burden on industry, Government, or its agencies.

Where maintenance dredging operations are found to have, or be having, a 'likely significant effect' upon a European Site, a port authorising or undertaking licensed, contracted or otherwise permitted maintenance dredging operations (including disposal) must exercise their functions in compliance with the requirements of the EC Habitats Directive. The Protocol provides assistance to operators and regulators seeking, or giving, approval for maintenance dredging activities that could potentially affect coastal and marine European sites. Following this process enables issues associated with the Directive 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.

In England the requirements of the Water Framework Directive (WFD) extend further, to consider the entire aquatic environment (out to 1 nautical mile (nm) from the baseline from which territorial waters are drawn), rather than specific designated sites. However, Good Ecological Potential is also a key requirement for maintaining the designated sites in favourable condition; hence the two requirements overlap.

A Baseline Document was originally produced for the Tees estuary in 2005 (ABPmer, 2005). Royal Haskoning (2008) represented an updated Baseline Document and incorporated information which is relevant to the integrity of the Teesmouth and Cleveland Coast SPA and Ramsar site.

The presumption in assessing any potential consequences of dredging activity is that maintenance 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. It should, however, be noted that there are proposals to construct a deep sea container terminal (referred hereafter as the Northern Gateway Container Terminal; NGCT) at Teesport; to undertake works at No 1 Quay in Tees Dock; and to construct Harbour facilities on the southern bank of the Tees estuary (as part of the York Potash Project) (although an application for the latter has not yet been made). These

projects will require capital dredging (to deepen the existing approach channel, Tees Dock and berths, or create new berths). However, the studies undertaken as part of the Environmental Impact Assessment (EIA) for these projects predict that the existing maintenance dredging practices will not be significantly altered following implementation of the schemes (Royal Haskoning, 2006; Royal HaskoningDHV, 2012; Royal Haskoning DHV, 2014a). The Baseline Document is, therefore, expected to remain applicable following the construction of these schemes, should they be implemented.

Other developers are located on the estuary and several occupy riverside sites with associated quays and jetties that also need to be serviced by maintenance dredging. Prior to the global financial downturn of late 2008 and 2009 a number of developers were seeking to expand their operations on the river subject to planning approval and marine consents. The current status of these proposals are summarised in this review as part of an assessment of potential cumulative effects on the interest features of the SPA and Ramsar site.

1.3 Study Area

The study area is defined as the area in which maintenance dredging is undertaken by PD Teesport; that is, the area commencing 185 m down estuary of the Tees Barrage at Blue House Point to the seaward limit of the Port Authority Area. This area effectively includes all river frontage and facilities within the estuary commencing near the Tees Barrage. The port facilities within Hartlepool Bay are also included in this area. PD Teesport may apply to re-align Hartlepool Channel during 2015 but this is to be confirmed. The study area is shown in Figure 1.1. This is subdivided into 13 sectors (0 – 12) with each shown respectively in Figures 2.1a – 2.1m, together with the respective volume of material dredged from 2001 - 2014 shown as a histogram.

1.4 Existing maintenance dredging regime

PD Teesport has a statutory duty to maintain navigation within the Tees estuary and into the Hartlepool docks. As part of this responsibility, PD Teesport must maintain the advertised dredge depths within the defined areas (hereafter referred to as “the maintained areas”). In order to achieve this, PD Teesport carries out maintenance dredging in the reaches of the river shown in Figures 2.1a – 2.1m. Most dredging occurs in the approach channel and low-middle estuary in order to maintain access to berth pockets and impounded docks.

The only other maintenance dredging undertaken within the study area is that carried out by Hartlepool Marina. This amounts to approximately 10,000 m^3 per annum but is not undertaken regularly. Up until the mid-1960s, most dredging was carried out on the River Tees by steam bucket dredgers. Trailing Suction Hopper Dredgers (TSHD) are currently used for the majority of the dredging and are supported by ploughing where required.

The present main channel has declared depths of 15.4m below Chart Datum (CD) in the approach channel (i.e. in Tees Bay), 14.1m below CD to upstream of Redcar Ore Terminal, 10.4m below CD up to Teesport and then progressively less depth up to 4.5m below CD in Billingham Reach. Parts of the channel now declared at 14.1m below CD were originally dredged to a deeper depth. Berths and docks vary depending upon the location and the vessels which require access. The approach channel to Hartlepool Docks is currently maintained to 5.7m below CD. Victoria Dock is maintained to 6.8m below CD and the deep water berths within the docks are maintained to 9.5m below CD.

A summary of dredged volumes (m^3) by each reach from 2001 – 2014 is provided in Table 2.1. Data on dredging has also been obtained from PD Teesport and extends the time series presented in Royal Haskoning (2008) from 2005 to 2014. This information is shown by reach in Figures 2.1a – 2.1m. As with previous reviews, no dredging has occurred in Reach 0 (Figure 2.1a) during the reporting period.

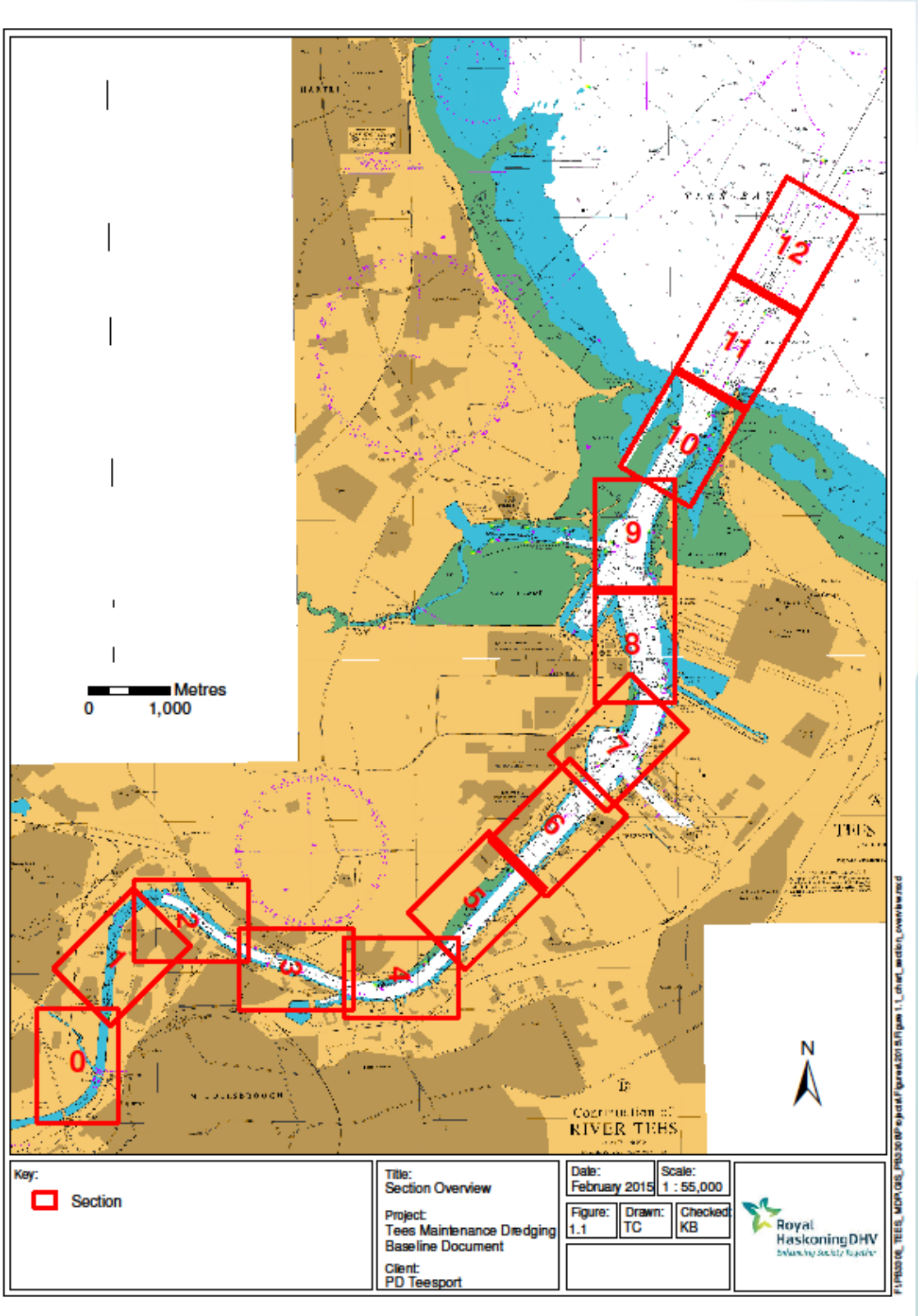

Figure 1.1 The study area showing the individual river reaches (0 – 12) used to describe the distribution of maintenance dredging activity on the River Tees during the period 2001 – 2014

2 CHANGES TO EXISITING MAINTENANCE DREDGING REGIME

2.1 Existing practices

Practices have remained unchanged during the period 2006 – 2014. PD Teesport employs two TSHDs of 1,500m³ hopper volume to maintain depths within the navigable channel and berths within the Tees estuary and Hartlepool. Both dredgers have active bottom door offloading systems. PD Teesport operates its vessels under the requirements of the International 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.

PD Teesport also currently operates its own 5m plough dredge (deployed via the buoy tender 'Wilton') to supplement ongoing suction dredging operations through the removal of isolated high spots on the riverbed, primarily in frontages or confined areas. This plough is supplemented with a 10m plough chartered in to support the dredge operations. Plough dredging may also be utilised to move recently deposited accumulations of sediment to adjacent scour spots within the river, thus maintaining sediment within the estuarine system and reducing the overall volumes of dredgings requiring disposal to sea. PD Teesport have increased ploughing using contracted in vessels on a quarterly basis and hope to have procured a new plough dredge by 2015.

PD Teesport's operational activities are undertaken in compliance with an Environmental Management System (EMS) meeting ISO14001 requirements and the PD Ports Group Environmental Policy Statement (provided below).

PD PORTS
A Brookfield Ports Company
Environmental Management

GROUP ENVIRONMENTAL POLICY STATEMENT

PD Ports is an established ports and logistics business offering marine and port operations, warehousing, transport, forwarding, chartering and recycling services throughout the UK.

We recognise environmental protection as one of our guiding principles and a key component of sound business performance. As such we are committed to minimising the environmental impact of our activities and preventing pollution through the implementation of an environmental management system meeting ISO 14001 requirements.

We will:

- Operate as a minimum in compliance with all relevant legal requirements applicable to our business.
- Incorporate the consideration of potential environmental issues into our decision making and operations, including purchasing activities.
- Train, educate and inform our employees about environmental issues that may affect their work and promote environmental awareness to all those working on our sites.
- 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 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.
- Aim and work to 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.
- Aim and work to minimise our impact on ecology through the terrestrial and marine planning process.
- Strive to continually improve our environmental performance by periodically reviewing our environmental objectives and targets in the light of new legislation and future plans.

Signature:

Position: Chief Executive Officer PD Ports Limited, February 23 2011

Issue: Final

Date: February 23 2011

2.2 New consents and licences

2.2.1 Marine Licensing

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. The 'marine licensing' system has been in force since 6 April 2011 and consolidates and replaces some previous statutory controls, including:

- licences under Part 2 of the Food and Environment Protection Act (FEPA) 1985;
- consents under section 34 of the Coast Protection Act 1949;
- consents under Paragraph 11 of Schedule 2 to the Telecommunications Act 1984; and
- licences under the Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) Regulations 2007.

The Marine Management Organisation (MMO) is the competent authority for marine licensing in English inshore and offshore waters.

Under the previous FEPA consenting system, a licence was required for the disposal of dredged material to sea, but not for the activity of dredging. Under the requirements of the new MCAA, all dredging activities require a marine licence unless all of the following are satisfied:

- Notice of the intention to undertake the dredging activity is given to the MMO before the activity begins;
- The dredging activity may only be carried out at a site and depth where in the preceding 10 years another dredging activity has been carried out;
- No more than 1,500 cubic metres of material may be dredged as a result of the proposed dredging activity and any other dredging activities carried out in the preceding year;
- 500 cubic metres or less of material may be dredged;
- The dredging activity must not cause, or be likely to cause, obstruction or danger to navigation;
- The dredging activity must not prevent or be likely to prevent any environmental objectives for that body of water as set out in the relevant river basin management plan, or cause environmental damage; and,
- The dredging activity must not be likely (either alone or in combination with other plans or projects) to have a significant effect on a European or Ramsar site, or be capable of affecting (other than insignificantly) the protected features of a marine conservation zone or any ecological or geomorphological process on which those features are dependent.

To comply with the requirements of the EU Waste Framework Directive (2008/98/EC), the MCAA was amended by the MCAA (Amendment) Regulations 2011 through the addition of further conditions to Section 75. The new conditions state that deposits at sea are only exempt under Section 75 where the following applies:

1. The activity involves the relocation of sediments inside surface waters (e.g. removal of dredged material from transitional and coastal waters and its deposit in other surface waters);
2. The purpose of the deposit is for managing waters and waterways, preventing floods, or mitigating floods and droughts and land reclamation; and
3. The appropriate licensing authority is satisfied that the sediments are not hazardous.

The amendments to Section 75 mean that the disposal at sea of dredged material by harbour authorities is likely to require a marine licence, unless for the purposes stated in point 2 above, provided the activity is authorised by a Local Act or Harbour Order and it has been demonstrated that the sediments are non-hazardous. The properties that determine whether or not a waste is hazardous are set out in Annex III to the EU Waste Framework Directive.

Forms of dredging which do not involve deposits (e.g. plough, water injection and agitation dredging) will not need a marine licence if carried out by a harbour authority in accordance with a Harbour Order or Local Act.

If the dredging activity does not qualify for an exemption from marine licensing, there is the potential for a low-volume dredging activity that complies with local or regional conditions to be processed under the new accelerated licensing process. The volume has to be between 500 and 3,000 cubic metres per campaign, and fewer than 10,000 cubic metres a year. The applicant must be able to demonstrate the low-risk nature through complying with agreed criteria and local or regional conditions. This would involve limited consultation and a shortened timescale. Activities will be licensed through this process if:

- dredging is ongoing and has been carried out in the same way for at least 3 years;
- campaigns are separated by at least 1 month;
- evidence on the quality of the sediment is provided; and,
- the project is assessed as part of a maintenance dredging baseline document or another form of assessment of likely impacts agreed with Natural England.

Other criteria relating to environmental protection and interference with other legitimate uses of the sea must also be met before a dredging activity can be confirmed as appropriate for the accelerated licensing process.

PD Teesport currently holds a marine licence (L/2012/00366) for the disposal to sea of maintenance dredgings. This licence will be renewed in 2015, and this review of the annual updates forms part of the supporting documentation for this renewal.

2.2.2 Marine Licences

Since the Baseline Document was first produced, a number of licences have been issued under the marine licensing system and its predecessors. It should be noted that those licences issued prior to 6th April 2011 (i.e. under FEPA) became 'deemed' marine licences on that date.

- Licence 33195/06/0 granted 05/09/06 – 04/09/08 for 19,800 tonnes (Dawson`s North Sea Supply Base (completed 2009) and TCP Heavy Lift Quay (completed 2008)). A new application was submitted in 2011 (under review) to dredge to 8.5m BCD. This development is now complete with limited dredge works remaining.

- Licence 32880/06/01 granted 14/09/06 – 14/04/09 for 88,000 tonnes (Billingham Reach Wharf, Tees Dock Turning Circle, Tees Dock Water Area and Corporation Dock). This operation is now complete.

- Licence 32717/08/0 granted 21/05/2008 – 20/05/2009 for the disposal of up to 1,934,836 tonnes of capital dredgings from Seaton Channel, the Holding Basin and Quays 10/11 of the Able (UK) yard was made by Able (UK) Ltd. on 02 December 2004. The licence was approved in May 2008 for disposal at Tees Bay A (TY160) and Seaton Channel was dredged in October 2010.

- Licences 34376/09/0 and 34377/09/0 were both granted on 26 October 2009 for works commencing no sooner than 1 January 2010 to the end of the day of 31 December 2013, for deposits in the sea in connection with marine construction works associated with the proposed QEII berth development; and for the deposit of 42,000 tonnes (21,000 m^3) of capital dredged material (Mercia Mudstone constituent only) from the QEII berth, at disposal site Tees Bay C (TY150). A variation to extend both licences were 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 the end date of 31 December 2016. A subsequent change was then required to transfer the licence holder from PD Teesport 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). This work has not yet commenced.

- Licence 34371/10/0 granted 4 June 2010 for works commencing between 5 June 2010 and 31 October 2010 for the reconstruction of an approximately 150m length of half tide embankment in the River Tees. The reconstruction used 45m long sections of Geotube which are to be filled with suitable dredged material. Substances authorised include concrete, gravel, plastic / synthetic. This work was completed in November 2010.

- Licence 34963/11/0 granted 28 January 2011 for works commencing between 28 January 2011 and 27 January 2012 for the disposal of dredged material (licensed quantity of 3,496 tonnes) from South Bank, Wharves (TATA) on the River Tees. The approved disposal site is Tees Bay A (TY160). This work did not commence and may not be undertaken.

- Licence L/2011/00052/3 granted 1 June 2011 for works commencing between 1 June 2011 and 30 September 2012 for the disposal of dredged material (licensed quantity of 2,804,000 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 operation is now complete.

- 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/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 work is ongoing.

- Licence L/2013/00217 granted 10 July 2013 for works commencing between 10 July 2013 and 31 March 2018 to undertake capital dredging and construction to improve the Tees Dock No.1 Quay. Work started in April 2014 and is ongoing; with further phases potentially taking place in 2015.

2.2.3 The Teesport Harbour Revision Order 2008

PD Teesport obtained a Harbour Revision Order (HRO) for the Northern Gateway Container Terminal (NGCT) in April 2008. The HRO, which came into force on 8 May 2008, contained approval of the power to dredge for the construction and maintenance of the Northern Gateway development (see Section 4.1). A marine licence will be required for the construction works and the disposal of dredged material to offshore disposal sites (and elsewhere in the marine environment, such as within the reclamation for the container terminal). It is not possible to predict when this application might be made at the time of this update.

2.3 Quantities dredged

Table 2.1 provides a summary of the total volume of dredged material (m^3), disposed of to an offshore disposal site, from each reach of the river shown in Figures 2.1a – 2.1m. Other areas including Tees Berths, Hartlepool and the Seaton Channel are also shown in Table 2.1. The total volume of maintenance dredged material disposal has decreased from 1.22 million m^3 in 2013 to 1.13 million m^3 in 2014. This is less than the average annual volume of maintenance dredged material disposal from the period 2001 to 2014, which equated to approximately 1.21 million m3 per annum. Figure 2.2 provides a chart of disposal of maintenance dredging material for all areas and all years.

Contributing factors to the reduction in volume of material requiring disposal offshore during 2014 are weather conditions and varied deposition rates.

2.4 Licence conditions

Extant licence conditions have remained unchanged during 2014. Exclusions have also remained unchanged since 2005 except for the additional interim exclusion of Teesport Commerce Wharf Dry Dock which was included within marine licence L/2012/00366.

Table 2-1 Summary of the total volume of dredged material disposal (m³) from each reach of the river Tees (and Hartlepool) from 2001 to 2014

Reach	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	5,911	127,827	42,384	70,856	12,361	27,075	42,701	49,701	24,159	40,237	19,066	73,544	25,674	48,268
2	21,768	122,381	16,470	73,210	11,649	12,982	26,028	19,805	60,118	32,817	371	9,814	8,863	15,894
3	0	1,366	4,176	3,205	412	412	1,925	735	1,772	48,532	0	37,429	0	52,857
4	3,131	1,666	127	4,468	676	282	1,514	0	274	6,056	11,386	1,500	2,996	12,504
5	4,621	1,634	2,751	3,815	5,997	1,339	764	0	1,336	4,745	13,496	2,541	15,018	5,370
6	1,625	5,282	24,645	4,859	23,640	12,092	3,088	18,906	7,037	17,009	41,303	21,755	26,210	3,630
7	51,303	4,804	10,765	3,297	1,243	2,642	9,841	55,084	19,322	43,157	12,502	10,160	19,746	42,200
8	37,075	76,297	72,261	39,251	30,172	56,926	96,160	82,531	140,839	68,357	27,102	64,468	131,948	93,188
9	256,158	252,715	279,054	330,835	321,316	347,365	332,679	349,982	174,009	266,187	336,050	278,883	286,441	124,821
10	174,248	118,613	171,950	137,022	161,349	168,733	143,089	178,819	186,336	317,961	117,635	211,799	221,176	201,953
11	112,437	296,471	85,385	121,807	113,304	230,099	97,682	92,427	163,910	225,143	159,529	110,787	43,032	110,777
12	34,747	28,437	28,156	48,707	21,307	28,262	39,441	23,548	27,937	12,133	38,877	35,415	7,662	5,954
Tees Berths	148,837	115,219	141,880	303,869	164,664	316,696	254,458	272,520	215,702	162,053	195,482	159,067	205,141	246,486
Hartlepool	119,847	157,329	146,457	114,104	89,811	137,606	121,605	132,041	125,032	170,170	154,025	80,410	186,229	99,068
Other	0	10,900	0	0	0	0	22,279	34,605	54,610	46,725	21,060	0	49,598	74,652
Seaton Channel	0	245	9,809	0	0	312	23,366	102,463	111,424	42,110	461	0	0	0
Total (x 10^6)	**0.972**	**1.321**	**1.036**	**1.259**	**0.958**	**1.343**	**1.217**	**1.413**	**1.314**	**1.503**	**1.148**	**1.098**	**1.230**	**1.13**

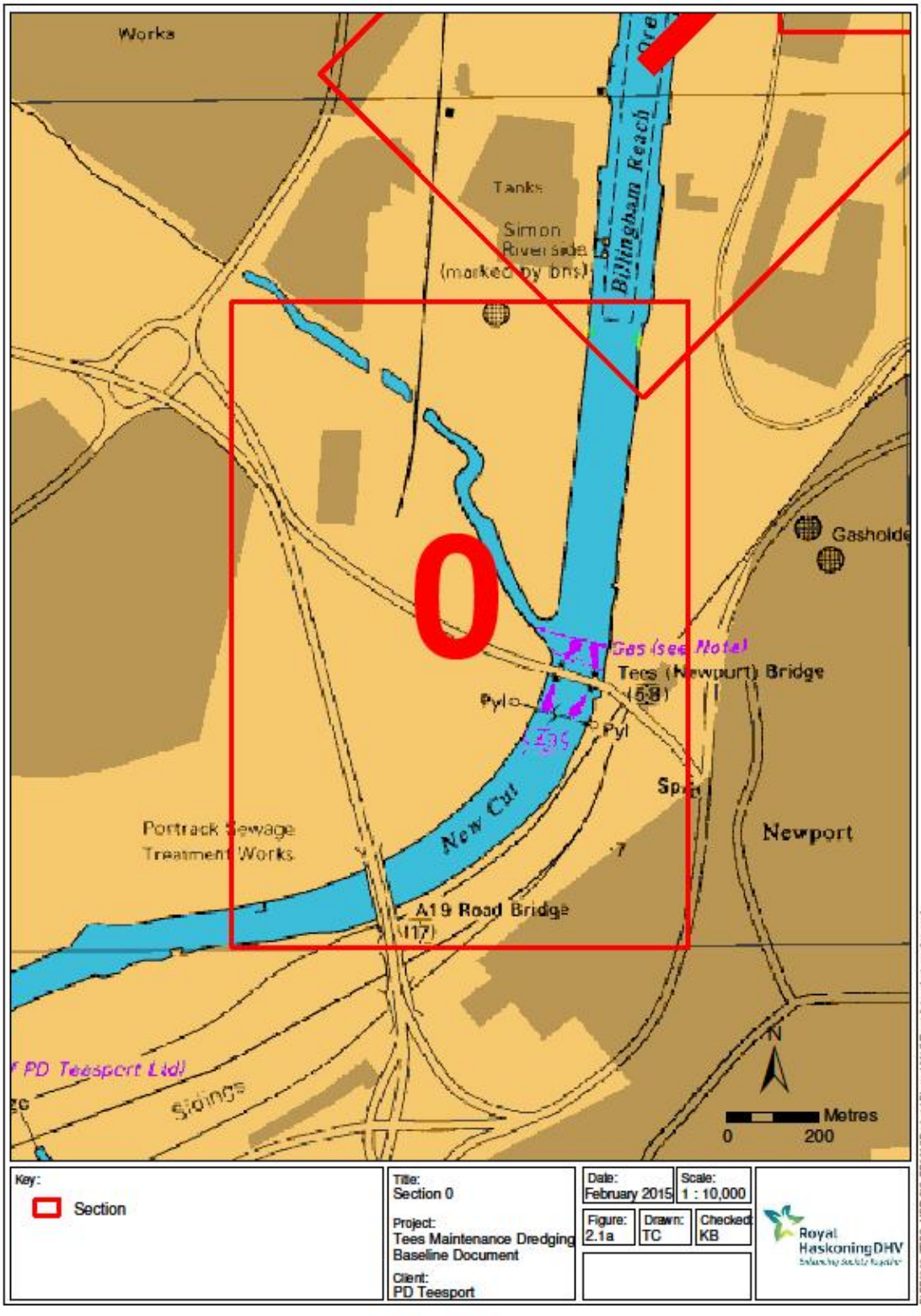

Figure 2.1a The volume of maintenance dredged material (m³) in reach 0 during the period 2001 – 2014

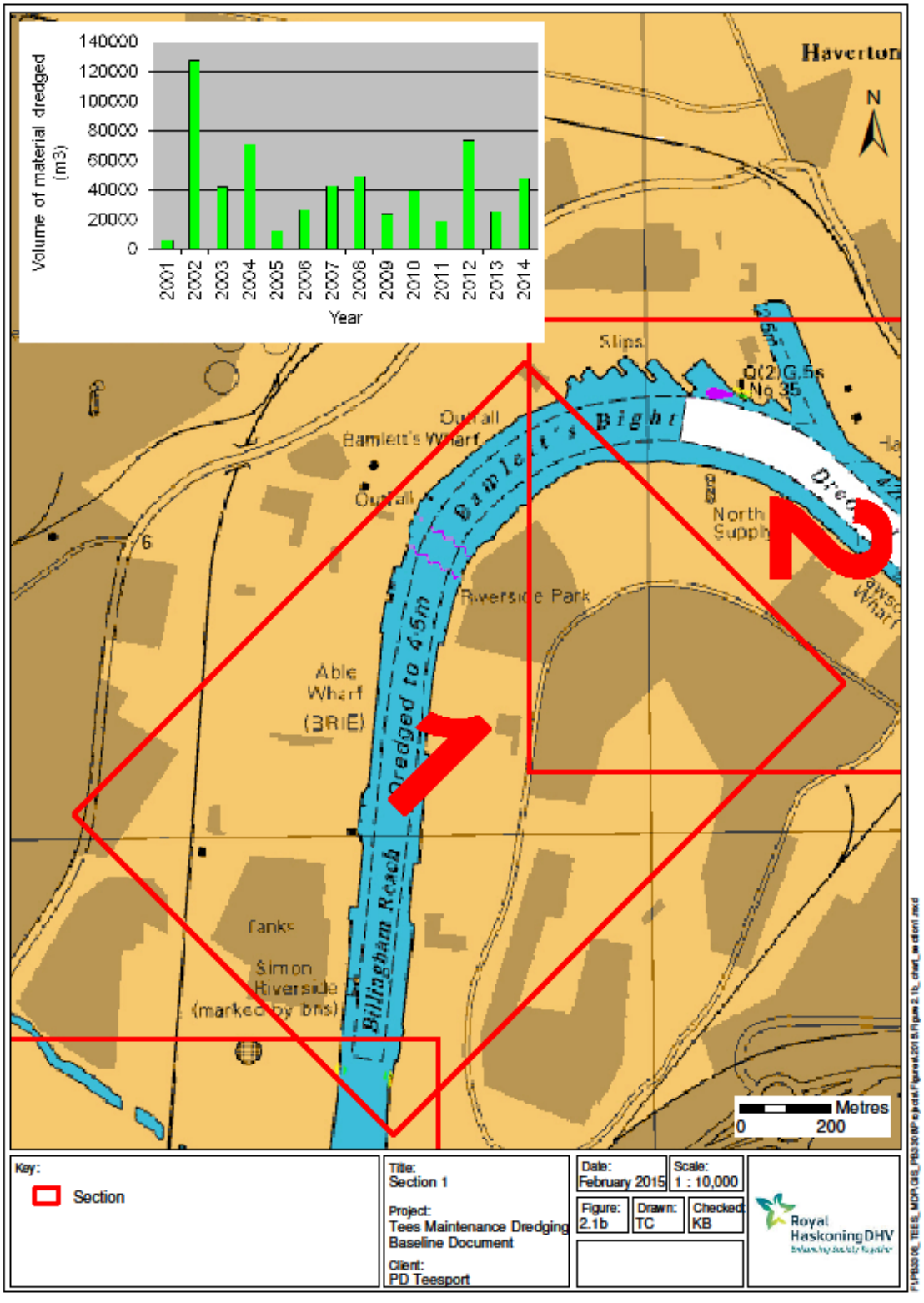

Figure 2.1b **The volume of maintenance dredged material (m³) in reach 1 during the period 2001 – 2014**

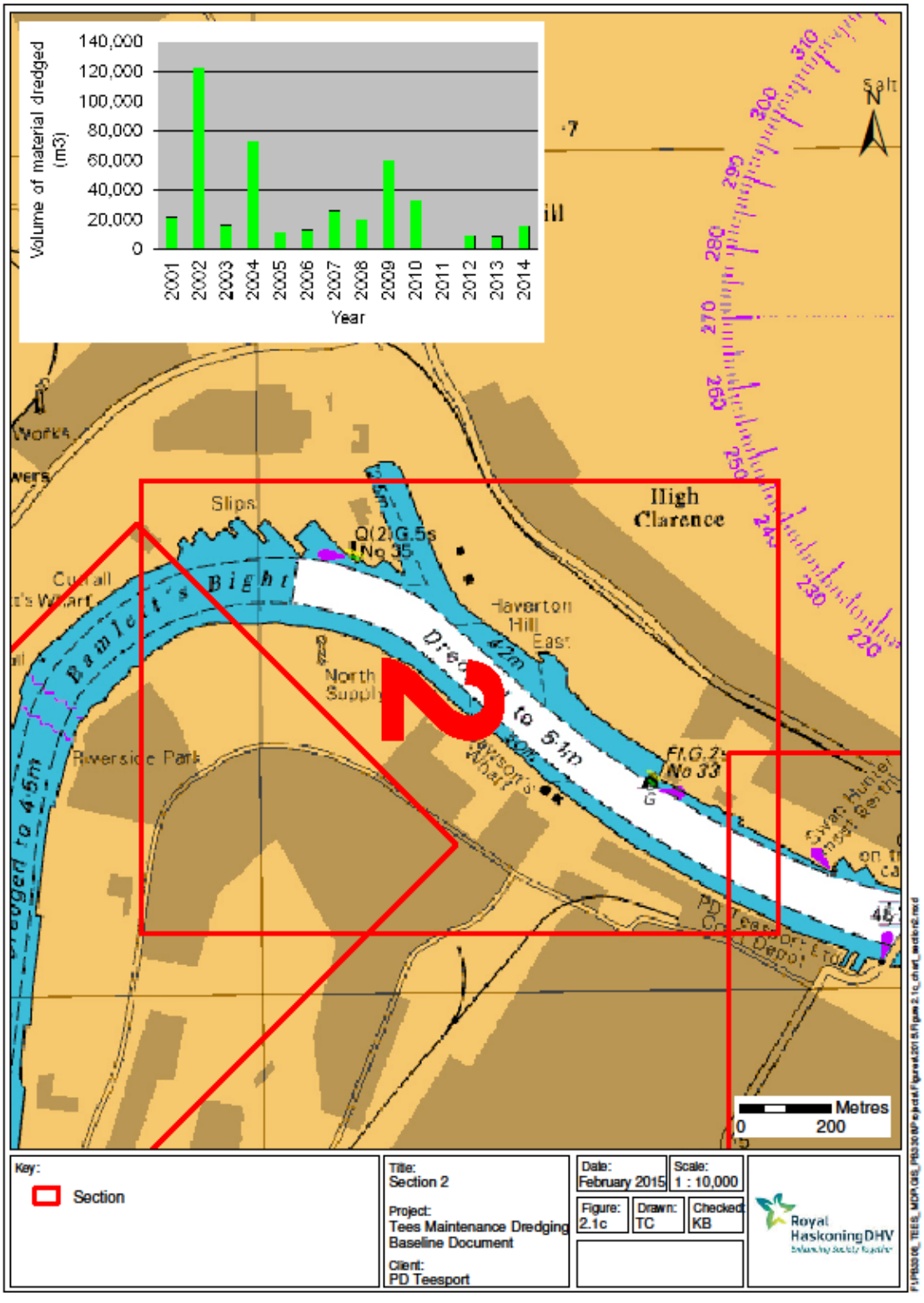

Figure 2.1c **The volume of maintenance dredged material (m³) in reach 2 during the period 2001 – 2014**

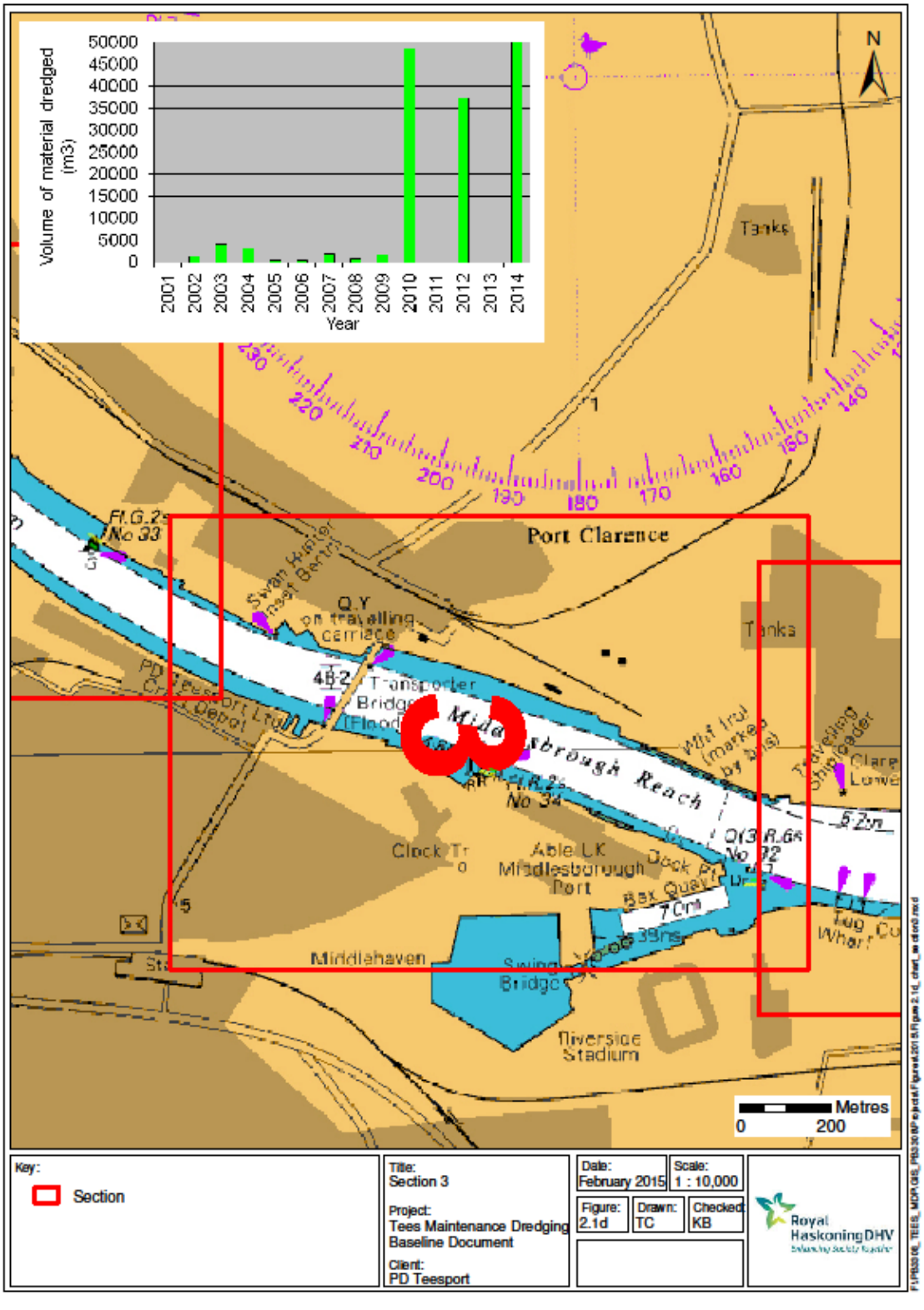

Figure 2.1d **The volume of maintenance dredged material (m³) in reach 3 during the period 2001 – 2014**

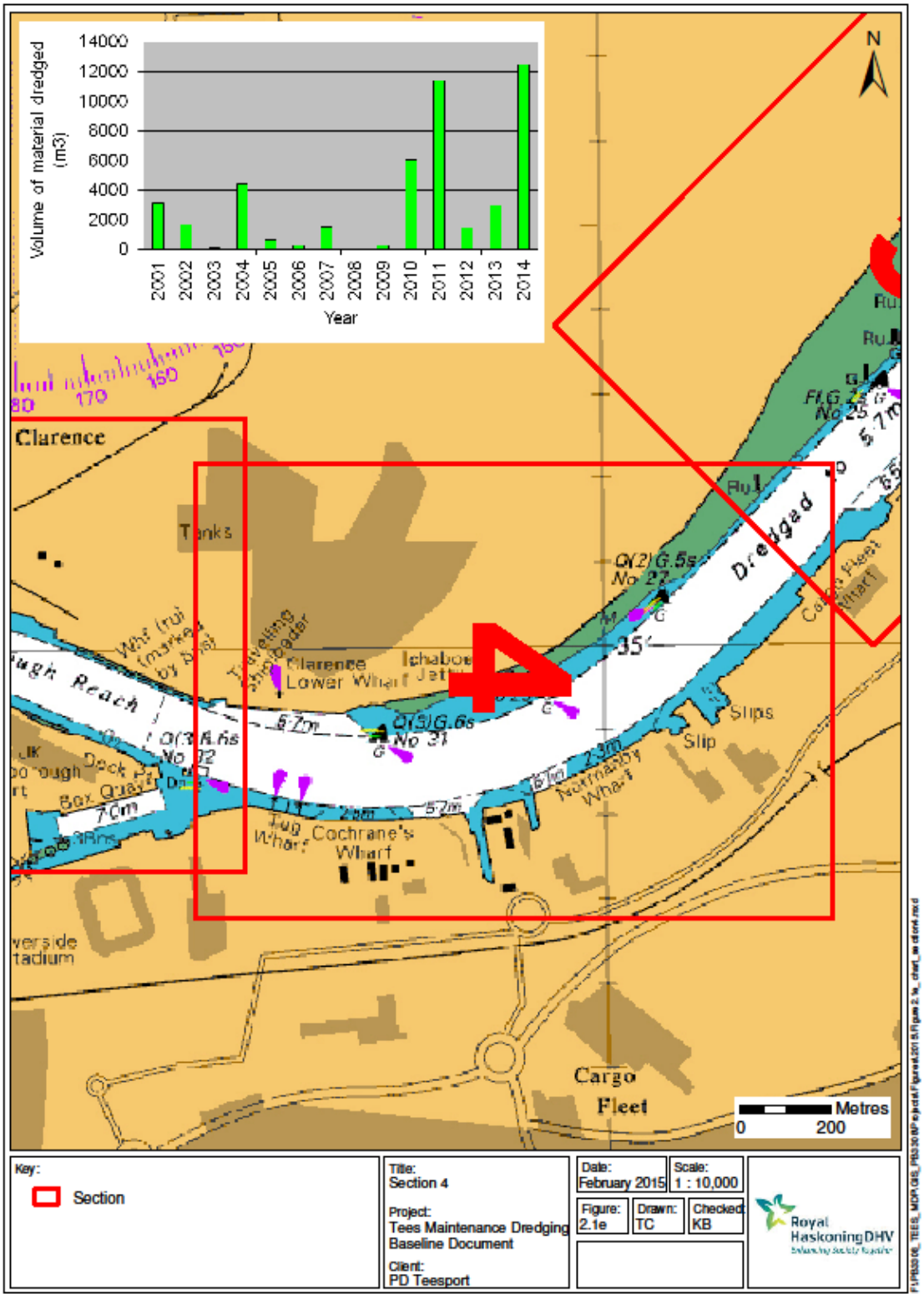

Figure 2.1e **The volume of maintenance dredged material (m³) in reach 4 during the period 2001 – 2014**

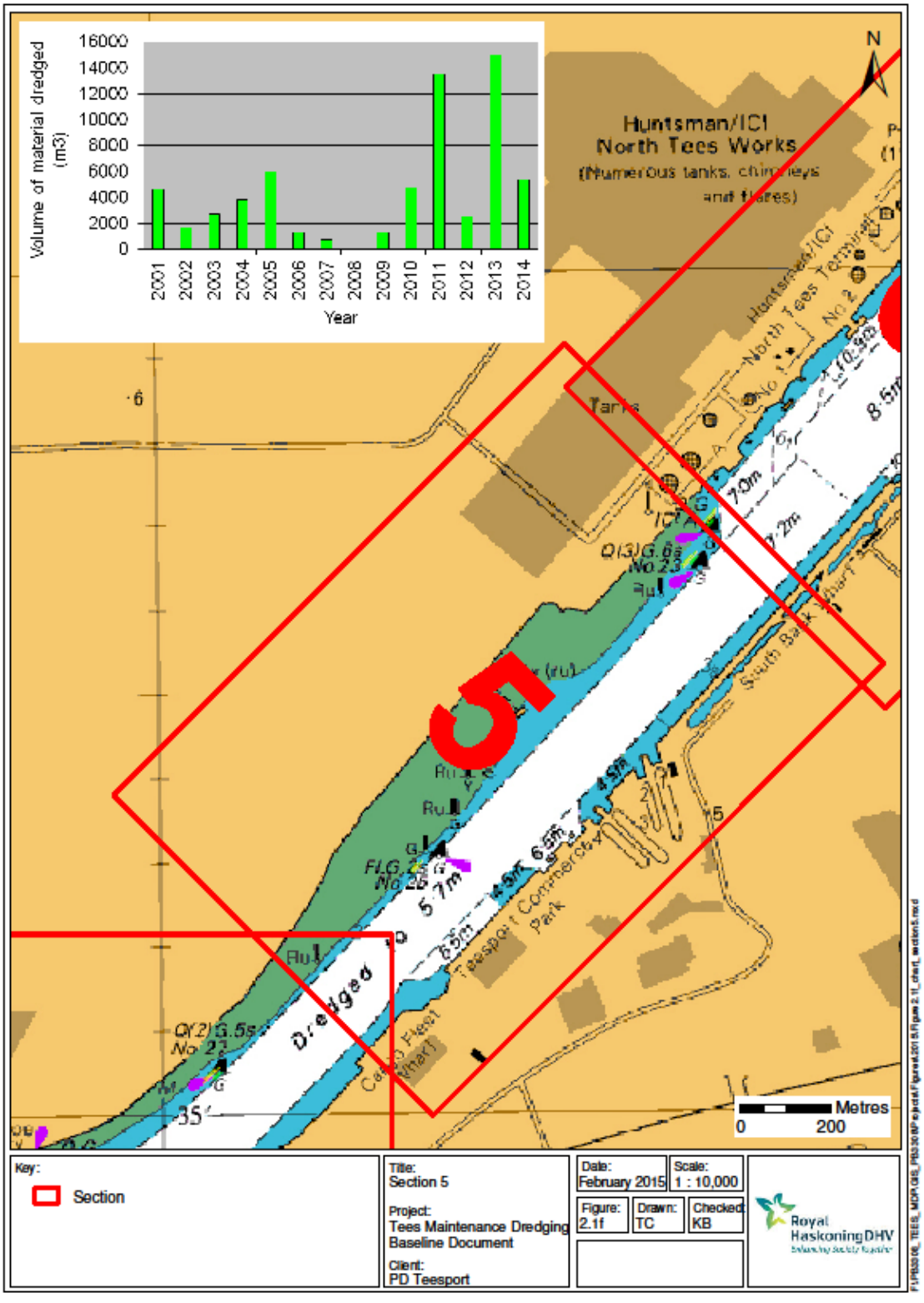

Figure 2.1f **The volume of maintenance dredged material (m³) in reach 5 during the period 2001 – 2014**

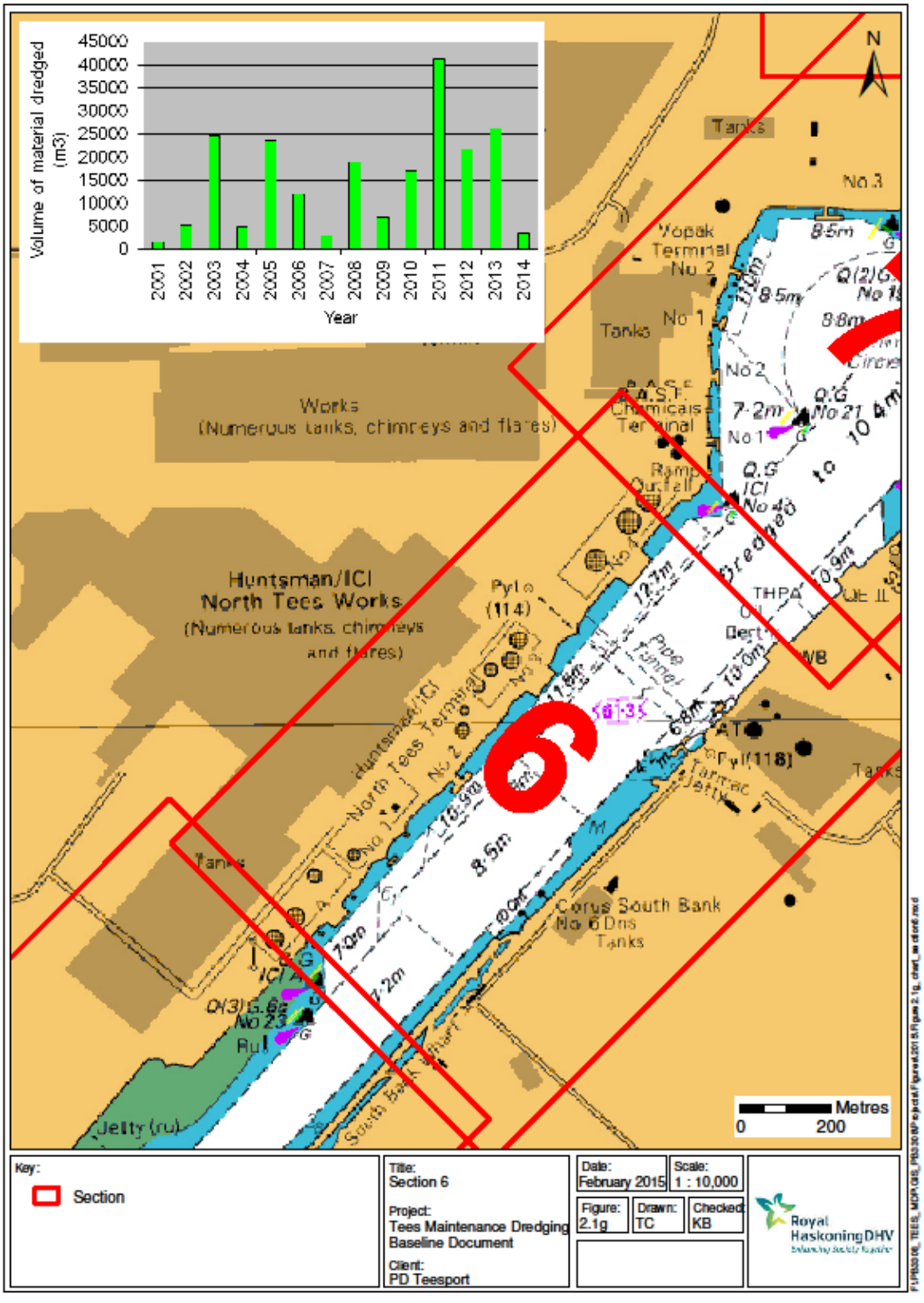

Figure 2.1g **The volume of maintenance dredged material (m³) in reach 6 during the period 2001 – 2014**

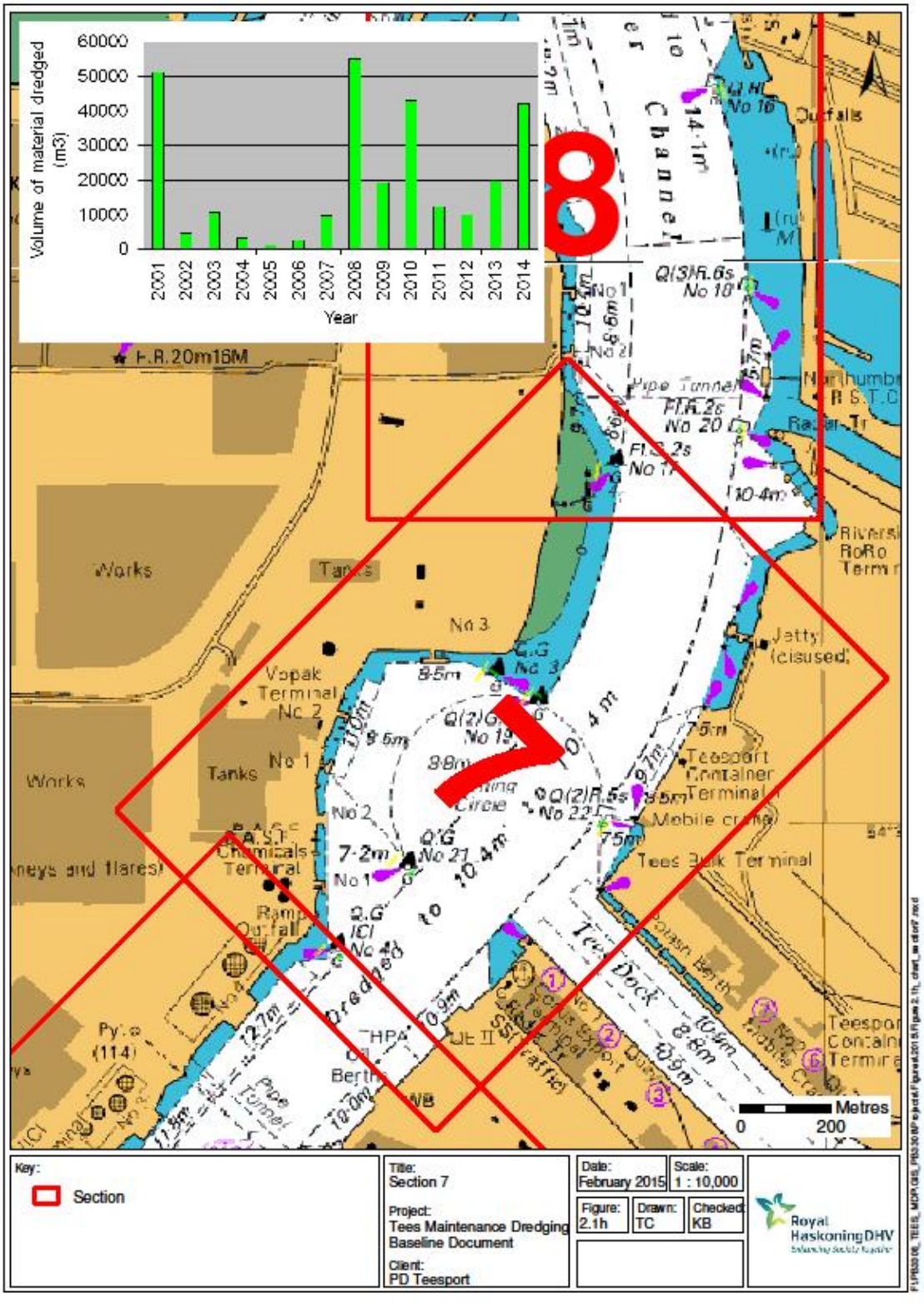

Figure 2.1h **The volume of maintenance dredged material (m³) in reach 7 during the period 2001 – 2014**

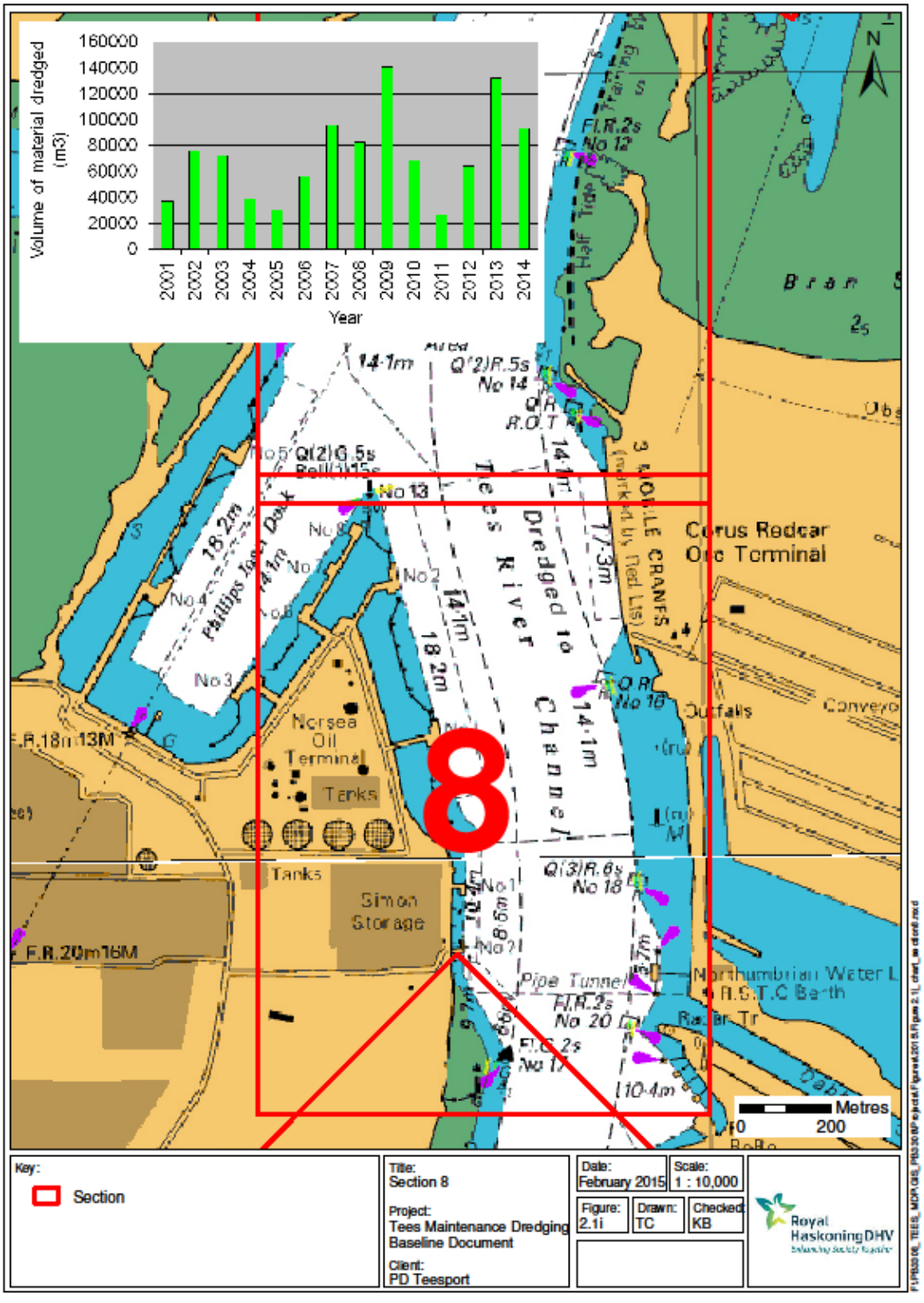

Figure 2.1i **The volume of maintenance dredged material (m³) in reach 8 during the period 2001 – 2014**

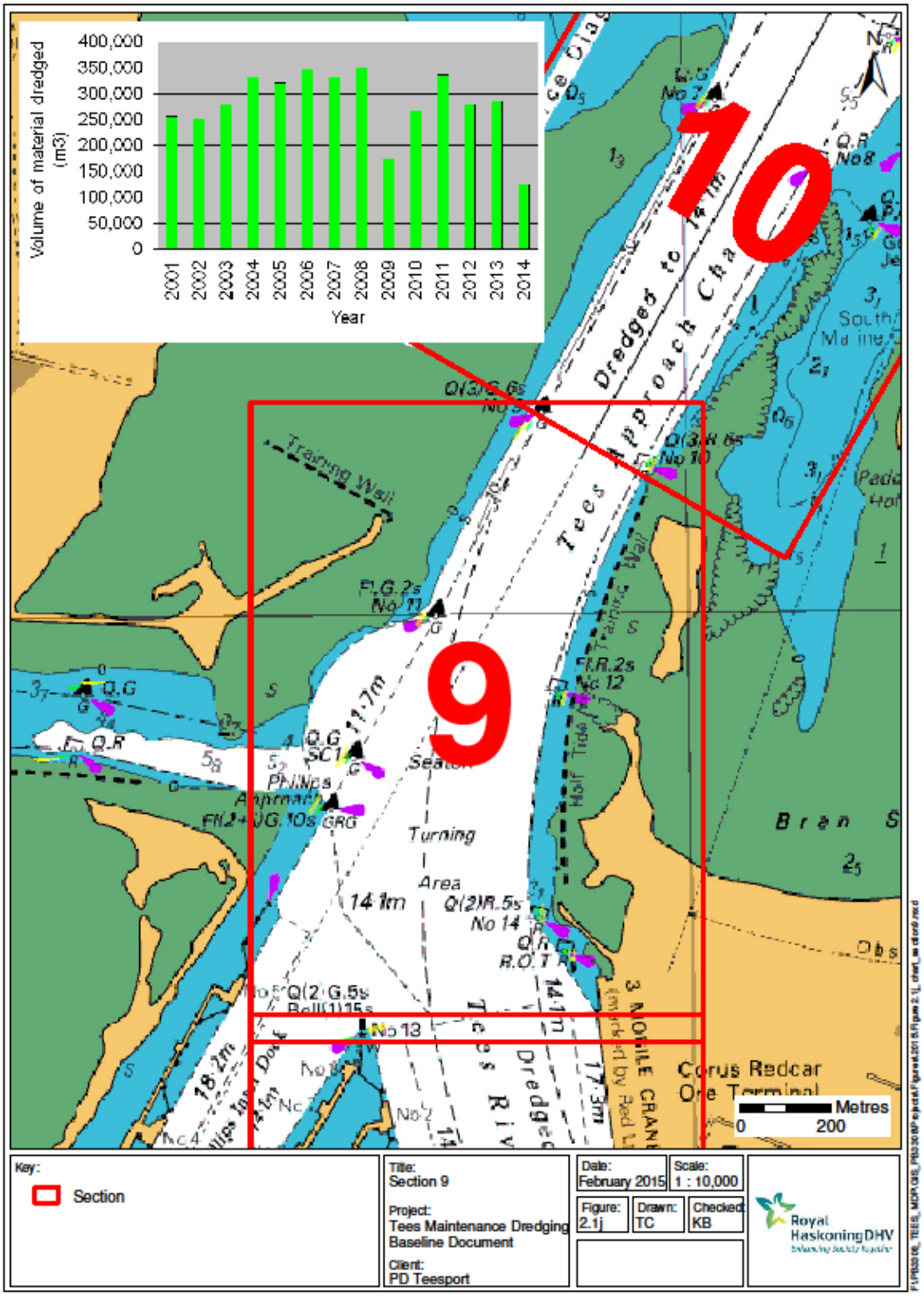

Figure 2.1j **The volume of maintenance dredged material (m³) in reach 9 during the period 2001 – 2014**

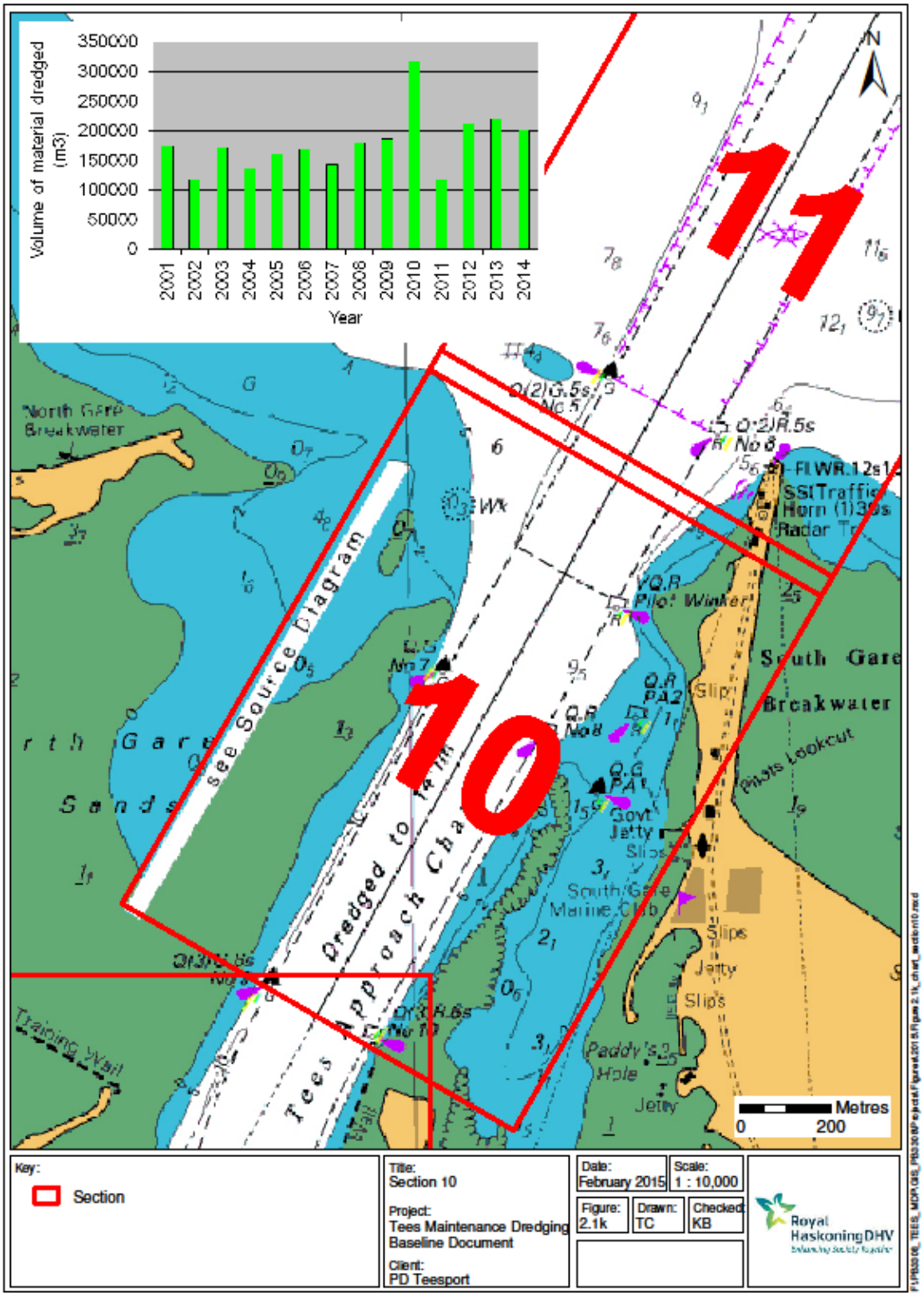

Figure 2.1k **The volume of maintenance dredged material (m³) in reach 10 during the period 2001 – 2014**

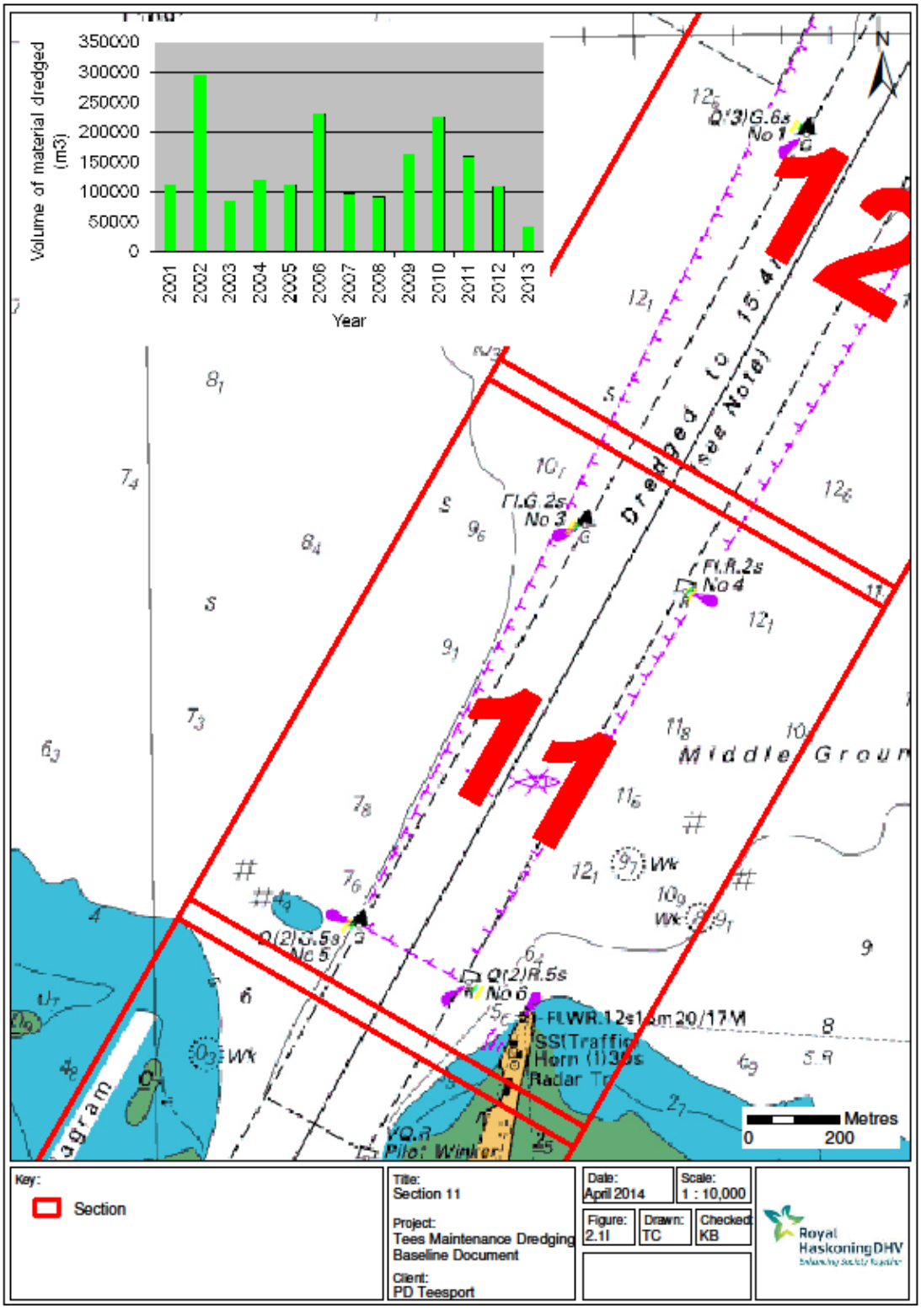

Figure 2.1l **The volume of maintenance dredged material (m³) in reach 11 during the period 2001 – 2014**

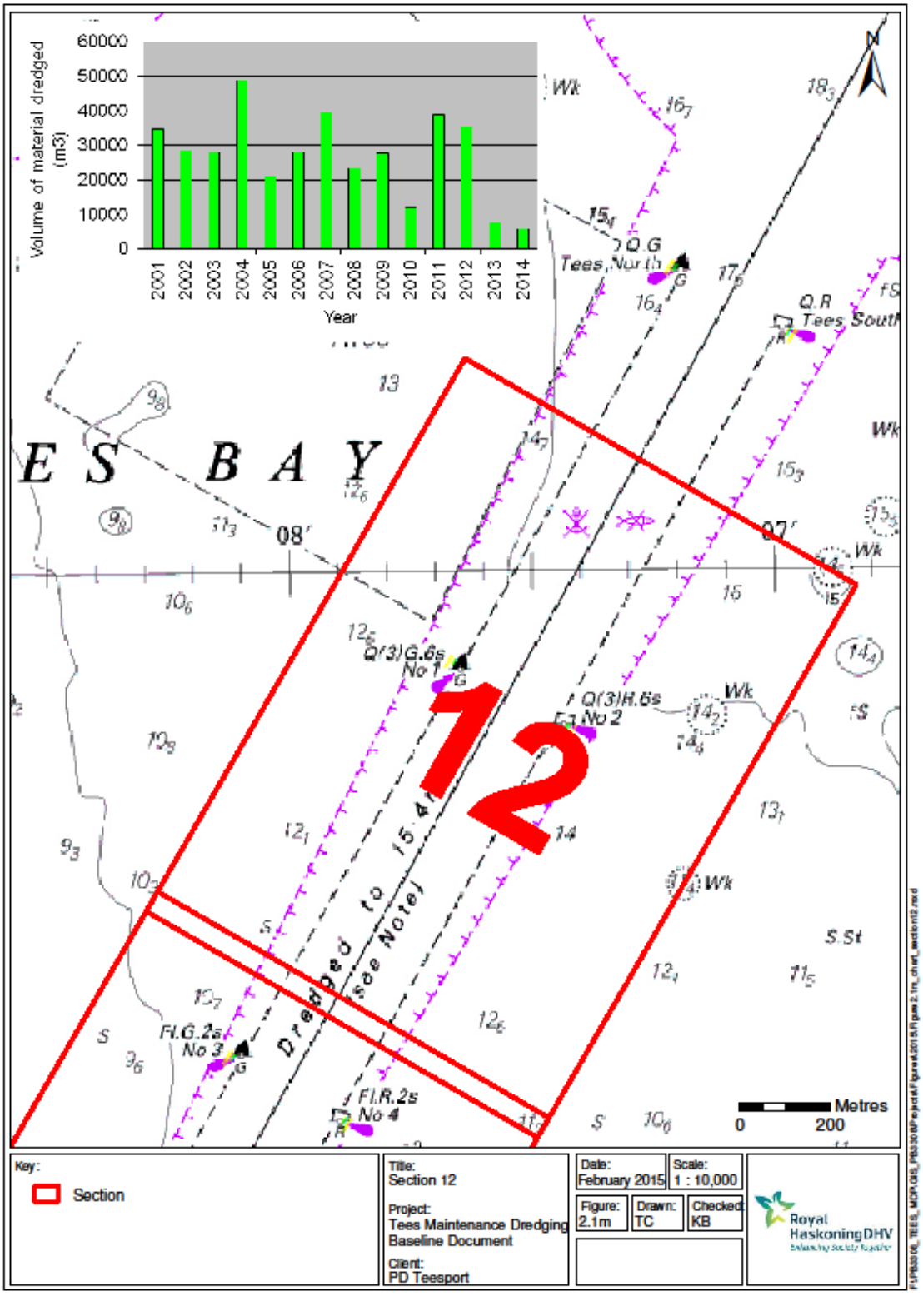

Figure 2.1m **The volume of maintenance dredged material (m³) in reach 12 during the period 2001 – 2014**

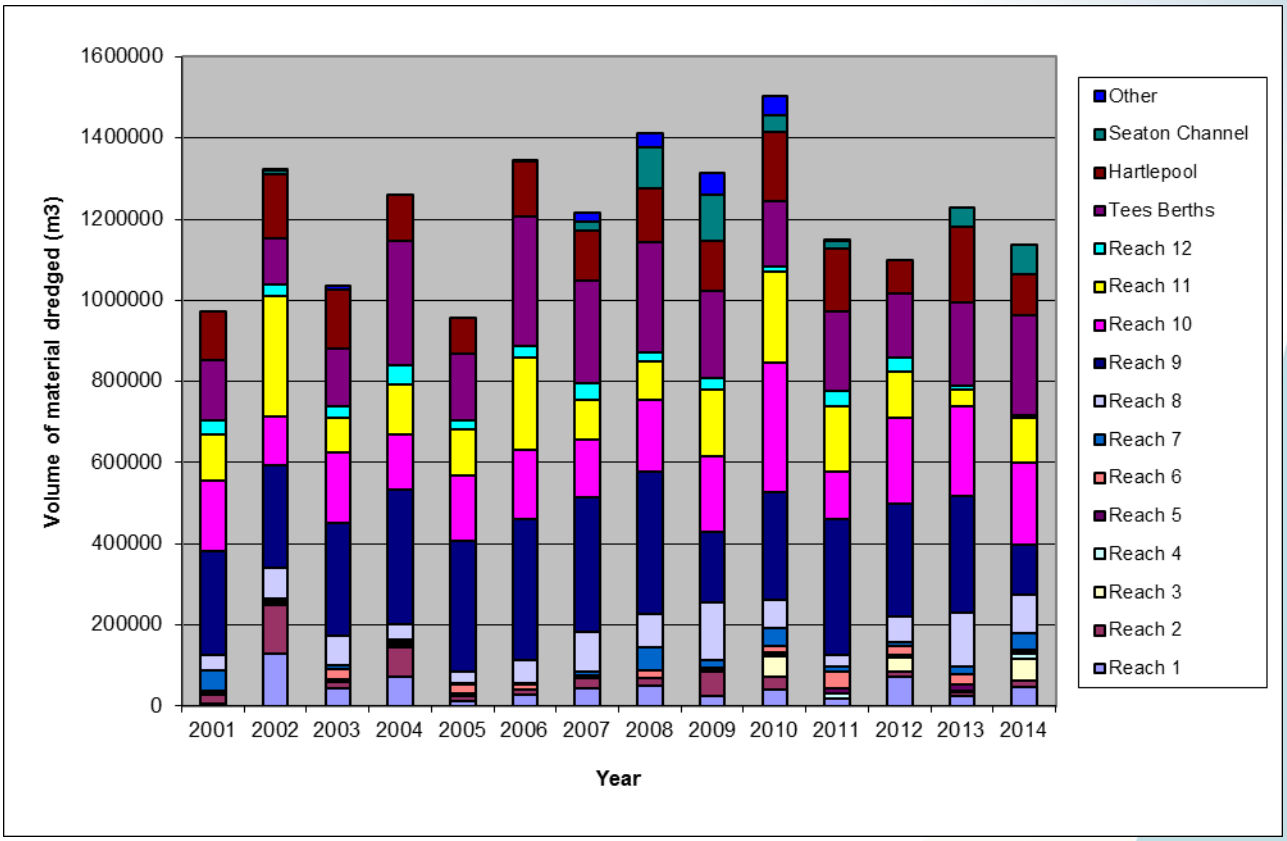

Figure 2.2 **Summary of maintenance dredged volume (m^3) during the period 2001 – 2014**

3 CHANGES TO EXISTING DISPOSAL STRATEGY

3.1 Disposal protocol

The volume of dredged material requiring disposal from maintenance dredging operations must be recorded and provided to the MMO and CEFAS as a condition of any licence. It is also recommended that a disposal protocol be developed to manage this process. It is the intention that the current document adequately addresses the requirement of any such protocol and, as such, PD Teesport has not developed a separate protocol for this purpose. All relevant information regarding disposal procedures and practices in place (including any beneficial uses) is provided in the following sections of this document.

3.2 Locations and quantities

No changes have occurred to the location of the offshore disposal sites during the reporting period. Historically, dredged material was disposed of in reclamation areas around the Tees estuary. Since 1970, however, material has been deposited at the Tees Bay offshore disposal sites due to the material dredged not being suitable for reclamation purposes. Additionally, areas to reclaim within the estuary are limited. The active disposal sites present in Tees Bay are summarised in Table 3.1. 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 (Figure 3.1). Tees Bay B (TY110) and Tees Bay Foreshore (TY170) are closed.

Table 3-1 Active disposal sites present in Tees Bay.

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.	DEFRA records show volume fluctuating from 0.3 million to 2.4 million wet tonnes over a 15 year period. Volumes drop off post 1996. Largest volume since 1996 was 1.8 million wet tonnes deposited.
Tees Bay C (TY150) Within the area bounded by joining the points 54 42.600N 00 58.600W 54 41.900N 00 57.400W 54 41.400N 00 58.700W 54 42.300N 00 59.900W 54 42.600N 00 58.600W	Active	Predominantly used for capital dredged material. Some maintenance dredging has been disposed of here.	DEFRA records show period small scale usage. Peak volume deposited in 1999 of 1.9 million wet tonnes associated with the construction of the downstream Ro-Ro berths. Usual yearly volume is 0.1 million wet tonnes. Some years show no usage at all.

Where suitable, a proportion of dredged arisings are proposed for beneficial use within the estuary (beneficial use considerations are a legal requirement of the marine licensing process for disposal activities). Areas of interest include the North Tees mudflat where regeneration of the mudflat and the construction of bird habitats are being considered. Although beneficial use has been considered for the re-charge of North Tees mudflat, this will only be undertaken if, since the reinstatement of the half-tide embankment in November 2010, natural processes do not appear to be working and therefore accretion of the mudflat is not occurring. Other areas of investigation include the possible beneficial impact of in-river dispersal of fine organic materials in the lower reaches to increase availability of organic material for deposition on Bran Sands and Seal Sands mudflats.

The use of geobag textiles is also being considered for the construction of 'bird islands' at Bran Sands, to replace those lost over the past few years. Various options for fill are being considered, including contaminated silts obtained through dredging operations from the proposed QEII Berth Development and the use of capital dredged material from the Tees Dock No.1 Quay Development. Such proposals are still being investigated at a high-level and would be subject to consultation and regulatory approval prior to implementation.

A 'Mitigation and Beneficial Use' plan is being developed by PD Teesport in conjunction with Natural England to address these and other potential beneficial uses. This Baseline Document will also be updated to reflect the findings of these discussions as and when they are available.

3.3 Mechanism of disposal

The mechanism for disposal during the reporting period has been for the dredger to steam out to Tees Bay A (TY160) and to release the dredged arisings over the disposal site via bottom door release (capital arisings from operations on the Tees are disposed of via a split hopper).

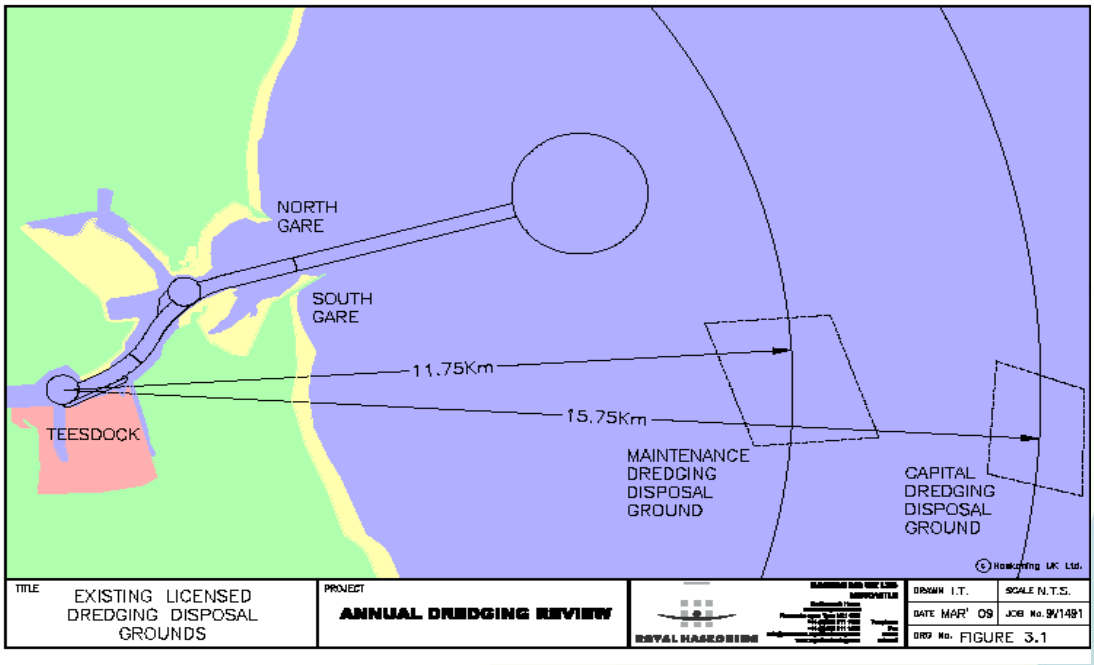

Figure 3.1 The location of dredging disposal grounds TY160 (maintenance material) and TY150 (capital material) and their distance (km) offshore from Tees Dock

The maintenance dredging disposal ground (Tees Bay A) has been divided into 12 areas, as shown on Figure 3.2. These areas each receive dredged material during a certain month of the year, with the volume of disposed material varying during each month. The current plan will be retained without changing areas and once CEFAS has carried out its survey of the area (e.g. for contamination), PD Teesport may act on that data and amend the disposal plan.

Table 3.2 reports the average annual disposal quantities from 2006 to 2014 and shows that the disposal of material is not concentrated at the nearest location to the Tees estuary, thus avoiding mounding of material within the disposal site boundary.

Table 3-2 Average disposal quantity per month from 2006 to 2014

Month	Disposal Quantity (m³)	Month	Disposal Quantity (m³)
January	110,200	July	109,642
February	103,738	August	103,002
March	106,288	September	118,564
April	116,415	October	114,108
May	110,355	November	110,794
June	96,029	December	67,847

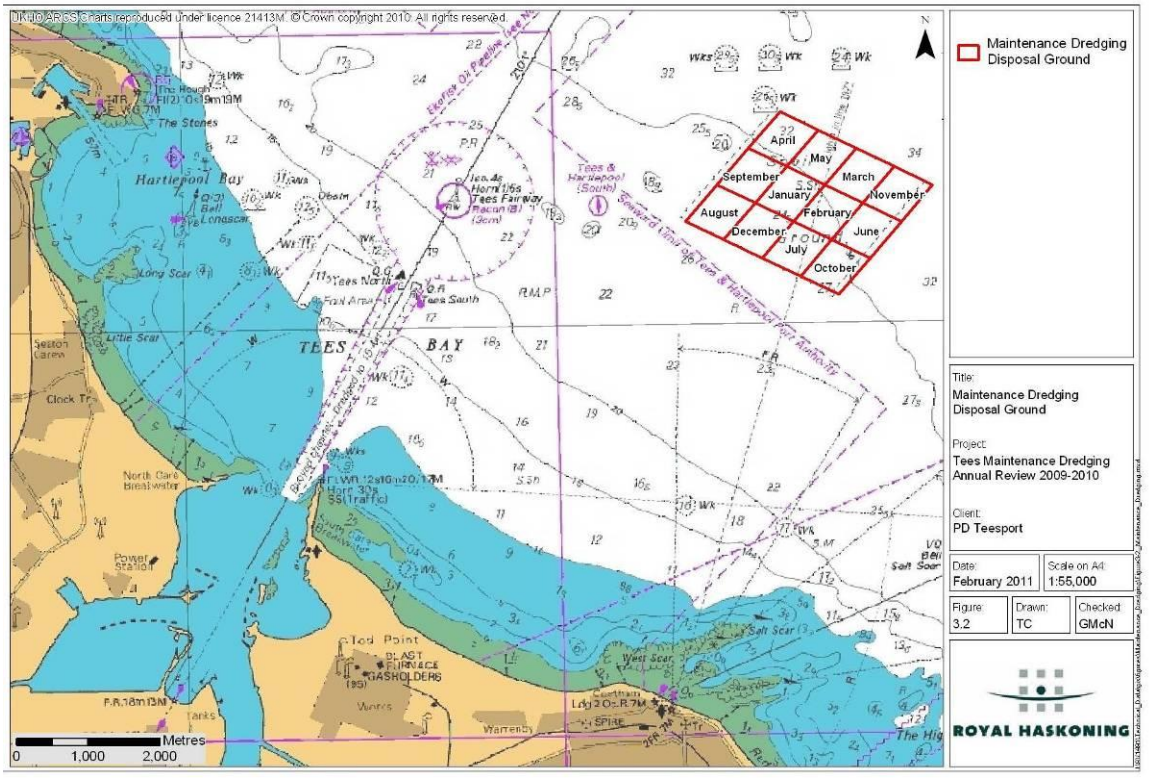

Figure 3.2 Maintenance dredging disposal ground by month of calendar year

4 UPDATE ON LICENCES AND CONSENTS

This section updates the status of each of the projects outlined below to describe the current situation for each project.

4.1 Northern Gateway Container Terminal (NGCT)

In April 2008, PD Teesport received approval of a HRO (and received outline planning permission from the local planning authority) relating to the construction of the NGCT. The HRO included the power to dredge for the purposes of construction and maintaining the works and affording access to the works by vessels from time to time to deepen, dredge, scour, cleanse, alter and improve the river bed, shores and channels in the vicinity of NGCT operations. Baseline information for this application was sourced from the NGCT Environmental Statement (Royal Haskoning, 2006). This project has yet to be implemented, with the potential for commencement in 2015, and a marine licence will be required.

4.2 Northern Gateway Container Terminal – Ground Investigations

The 2008 HRO and outline planning permission for NGCT allowed an extensive programme of ground investigations to be taken forward within the river and adjacent terrestrial sites. Currently, the ground investigation programme has not been undertaken and no samples have been collected with the exception of the QEII jetty (see Section 4.3).

4.3 Queen Elizabeth II Jetty EIA

As part of the investigations in support of the EIA for the development of the QEII jetty, a limited number of boreholes and grab samples were undertaken in early 2009 from the vicinity of the existing QEII berth. In addition, a sediment dispersion modelling study relating to the proposed development was also undertaken.

Subsequent chemical analyses has shown that unconsolidated sediments from part of the proposed capital dredge area are contaminated to such a level as to preclude their disposal to licensed offshore disposal sites. As such, alternative disposal/reuse options have been investigated. The Mercia Mudstone constituent of the proposed capital dredge required for this development (approximately 42,000 tonnes or 21,000 m³) has been licensed for offshore disposal at the Tees Bay C (TY150) site (marine licence L/2013/00404/3). This project has yet to be implemented.

4.4 Tees Dock No.1 Quay EIA

PDT is proposing to make improvements within the existing Tees Dock including the deepening and widening (capital dredging) of the berth at Tees Dock No.1 Quay, and resultant required strengthening reconstruction of the existing quay. These works are required to enable the reintroduction to No 1 Quay of the existing business operations that currently exist at Teesport and to facilitate the use of No.1 Quay by 'Mini-Cape' size vessels (approximately 260m length, 40-45m beam and 13.5m draft) for the loading of steel slab from the Sahaviraya Steel Industries (SSI)-owned Teesside steelworks.

The proposed works consist of the following:

- Capital dredging of 'Tees Dock Water Area'; 'Tees Dock No.1 Quay' and 'Tees Dock Additional area';
- Disposal of dredged arisings; and,
- Reconstruction of Tees Dock No.1 Quay.

A marine licence application, supported by an Environmental Statement, was submitted to the MMO on 04 December 2012. A marine licence (L/2013/00217) was granted on 10 July 2013 for works commencing between 10 July 2013 and 31 March 2018 to undertake capital dredging and construction to improve the Tees Dock No.1 Quay.

Three subsequent variations were made to the marine licence (L/2013/00217) due to a change of two conditions; addition of dredge and disposal quantities; and addition of a vessel. The most up to date marine licence is, L/2013/00217/3 which was issued on 01 October 2013. Work started in April 2014 and is ongoing; with further phases potentially taking place in 2015.

A fourth variation request was submitted on 12 November 2014 for an additional dredge area in the Tees Dock turning circle as part of the No.1 Quay project for ease of vessels turning in and out of Tees Dock (no increase in the width). This will result in an additional dredge volume of approximately 65,000m³ and therefore will increase the, currently, licensed amount from 262,100m³ to 327,100m³. Work will be undertaken by a trailer suction dredger and the areas width

would be approximately 95m, taking the depth down from approximately 8.8m below Chart Datum (bCD) to 10.9m bCD. This variation request is still being considered by the MMO and, therefore, this work is still to be implemented

4.5 Seaton Channel and Able UK Ltd

Due to the expansion of ship recycling operations at the Able (UK) yard at the head of the Seaton Channel, maintenance dredging to 8.1m below CD was undertaken in early 2009 to facilitate the passage of vessels due to be broken at the yard. Table 2.1 shows an increase in the volume of dredged material removed from the site since 2007 although no new baseline information other than the dredged depth is available and little maintenance dredging was required during 2011.

A FEPA licence application (Licence 32717/08/0) for the disposal of up to 1,934,836 tonnes of capital dredgings from Seaton Channel, the Holding Basin and Quays 10/11 of the Able (UK) yard was made by Able (UK) Ltd. on 02 December 2004. The licence approved disposal at site A (TY160) for a period of 12 months from 21 May 2008. During 2008, capital dredging by Able (UK) Ltd, disposed 100,500 m^3 of dredged arisings at Tees Bay A. The work has, therefore, now been completed.

4.6 Environment Agency – Tees Tidal Flood Risk Strategy

The Environment Agency are currently progressing the first Flood Alleviation Schemes (FAS) to come from the Tees Tidal Flood Risk Strategy. The Strategy was completed in 2009 and recommended the raising and/or improving of existing flood defences throughout much of the Tees Estuary in recognition of the national economic importance of the industries, and residential areas potentially at risk from tidal flooding.

The Strategy predicted that its implementation would have implications for designated sites of nature conservation importance, including the Teesmouth and Cleveland Coast SPA, through 'coastal squeeze' and subsequent loss of important intertidal habitats (e.g. mudflat, sandflat and saltmarsh). As such, the Environment Agency is legally obliged to provide 'compensatory habitat' for these losses (approximately 13ha). This will be achieved through the implementation of the Greatham North FAS (Environment Agency, 2010a), which covers two of the Environment Agency flood cells and will comprise the following:

1. Improvements to the existing defences for the Greatham North East (NE) flood cell; and,
2. Undertaking managed realignment in the Greatham North West (NW) flood cell through the partial removal of flood defences along the northern bank of Greatham Creek.

The Greatham North FAS also aims to compensate for predicted losses of intertidal habitats attributable to the Redcar FAS (see section 4.8 below).

The application was submitted to Hartlepool Borough Council, which granted planning permission on 05 March 2012 for a period of 3 years, and to the MMO, which granted a marine licence for a period of 2 years. This work has now been completed.

4.7 Environment Agency – Redcar Flood Alleviation Scheme

The Redcar FAS will involve the raising in height of the current sea wall defences along Redcar's frontage and replacing a failing revetment with a new revetment to dissipate storm wave energy more effectively (Environment Agency, 2008). As mentioned in Section 4.7, this scheme will result in the loss of intertidal foreshore areas through coastal squeeze, and as such the Environment Agency has a legal obligation to provide compensatory habitat. This is linked to the proposed habitat creation at Greatham Creek under the Greatham North FAS. Work on the new sea defences began in February 2011 and has now been completed.

4.8 Simon Storage – Fender Refurbishment Scheme

The proposed scheme was required as the existing fender system at Jetty No.1 was showing signs of distress and damage due to many years of use. Dolphin D was required to provide a level of safety to the existing dolphins and largely mitigate the possibility of the existing dolphins being overloaded (which could impact upon the long term integrity of the jetty). The proposed works are summarised as follows:

- Contractor taking possession of Simon Storage Ltd. Jetty No.1 for the duration of the construction window to allow construction works to be undertaken safely;

- Cutting and removal of the existing fendering system on Dolphin A, B and C, (illustrated on Figure 1.1) comprising timber and steel works;
- Installation of tubular piles over the existing piles at Dolphin A, B and C to support the new fender system, and installation of piles for Dolphin D;
- Concreting works and installation of the new fender system for Dolphins A, B, C and D; and,
- Installation of a walkway from Dolphin C to Dolphin D.

There was no capital dredging required as part of the proposed scheme.

An Environmental Statement and a Habitats Regulations Assessment were not required as part of the marine licensing process. Work began in April 2014 and has now been completed.

4.9 A V Dawson Ltd - North Sea Supply Base

A replacement quay was required as part of the North Sea Supply Base. Additional quay space was necessary due to the movement towards larger ships leading to an increase in demand for quay space and water depth; and Energy / Offshore Wind Sectors. This resulted in an increased demand from customers requiring support ship mobilization services as well as layby services. The works required in order to do this were the removal of concrete deck; the construction of the new quay; dredging of the berthing area; and disposal to sea of some dredged material. This development was completed in 2014.

4.10 Other proposals

A number of other developments on the river have been proposed since the introduction of the Baseline Document, including Vopak Jetty No.4 and Conoco Phillips on the north bank. These are located within reaches 7, 8, and 9 (see Figure 2.1a – 2.1m) extending from a point opposite Tees Dock downstream to the Seaton Channel. Each of these two proposals have been postponed until further notice and prior to any dredging activity taking place. The reason for the delays has been attributed to the global financial downturn of late 2008 and 2009. The status of such potential projects is unknown.

The Harbour facilities element of the York Potash Project constitutes a Nationally Significant Infrastructure Project (NSIP), requiring a Development Consent Order (DCO) from the Secretary of State. The Harbour facilities include construction of a port terminal and capital dredging to create a berthing pocket. The DCO application has hot yet been submitted.

5 NEW ENVIRONMENTAL INFORMATION

5.1 Coastal Processes

Technical Note 01 - Coastal Processes Overview

In 2011, PD Teesport commissioned a Coastal Processes Overview (Royal Haskoning, 2011) to provide a background description of the physical processes and morphological features in Tees Bay and along the Redcar frontage. This understanding was to provide a basis for assessment of the potential, or otherwise, for maintenance dredging activities by PD Teesport to affect beach processes in the vicinity of Coatham Sands and Redcar Sands.

Based upon the findings of the Coastal Processes Overview, the following main conclusions were drawn relating to the potential impacts of PD Teesport's 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 (reported in Royal Haskoning, 2011), 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 are 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 is considered that the protruding nature of the Redcar frontage as a promontory from the natural coastal alignment is a far greater cause of those beach level fluctuations that are experienced.

Furthermore, to an extent the impact of the maintenance dredging is mitigated through the placement of the maintenance arisings at a licensed disposal site near to, but downdrift of, the River Tees Approach Channel. Whilst material dispersed from this site will become entrained in the predominant south-easterly directed tidal flows that run parallel with the shoreline, it will mostly bypass the Redcar frontage further offshore and, major onshore storms notwithstanding, come back to shore further south-east of Marske and Saltburn in a widely dispersed manner.

The Environment Agency is known to be currently considering the potential for maintenance dredging arisings to be used beneficially in the form of foreshore recharge operations. This would be a good example of 'sustainable sediment management' but would require chemical and physical testing of the maintenance dredge arisings and assessment of suitable candidate placement sites based on an understanding of the physical transport processes.

PD Teesport undertook Particle Size Analysis (PSA) in August 2012 for sediments within dredge areas 9, 10 and 11 to gain an up-to-date baseline for the materials currently removed through maintenance dredging activities. The results of this are reported below.

Dredging of the River Tees

The volume of sediments dredged each year from the River Tees varies depending on the rates of accumulation that have been experienced, but over the long term is of the order of 1,000,000m³.

A proportion of this is mainly marine sand dredged from the river mouth and navigation approach channel within Tees Bay, with mainly river silts dredged from within the berths and river channel upstream of the mouth. At present, the dredged material is taken out to sea to licensed disposal grounds.

Tees Bay and the River Tees estuary attract sediment because the tidal current flows are generally quite low compared to other coastal areas. This is due to Tees Bay forming a shallow embayment within the general alignment of the north

east coastline. The low tidal current flows mean that sands brought into Tees Bay from the North Sea tend to settle on the sea or river bed below the water surface, gradually building up over time.

The tidal current flow patterns within Tees Bay generally run parallel to the shore, flowing towards the south on the flooding tide and towards the north on the ebbing tide. Generally, these tidal flow patterns determine the transport of sediment within Tees Bay, with an overall tendency for southerly directed transport because the flood tides are stronger than the ebb tides. The larger waves that occur during storm events will stir sediment from the sea bed enabling more to become transported by the tidal currents during these storms.

However, there are also more complex patterns in the vicinity of features which interrupt the general flow patterns. For example, there is a local circulation in the north of Tees Bay within the shelter of Hartlepool headland, another just east of the South Gare Breakwater at the river mouth within the shelter of the breakwater itself, and the adjacent German Charlies slag banks. These subtleties locally influence sediment transport in these locations.

The practices of dredging and disposal of materials are regulated and subject to annual review to ensure that they do not have an adverse effect on other areas.

One particular long-running concern has been whether the dredging and disposal activities adversely affect the beaches at Redcar. However, if sand did not naturally become deposited within the navigation approach channel, and then subsequently dredged and disposed of at sea, then it would not necessarily all be transported along the coast towards Redcar beaches. Some of the material would instead be swept into the River Tees on the flooding tide and become deposited on the sandy foreshore areas within the river mouth or within the river channel. Some of the material would also be swept past the river mouth and bypass the Redcar frontages at a distance further offshore, whilst some would become caught by the local clockwise circulation of tidal current flows just east of the South Gare Breakwater and be swept along the Coatham Sands frontage back towards the river mouth.

Therefore only a very small proportion of material would have the potential to feed the Redcar beaches if it were not naturally deposited within the navigation approach channel. Due to this, it is concluded that the dredging and disposal activities have, not to date, had an adverse effect on the Redcar beaches. Indeed, beach monitoring records at Redcar, which began in 2008, have shown that there has been a general accretion of sand along the Redcar frontage over recent years, although of course beach levels can vary quite substantially over shorter durations due to individual storm events.

As much of the dredging occurs within the approach channel to the River Tees entrance, consideration has been given to whether the sediments dredged from this area of sea bed could alternatively be used to replenish beaches along the Redcar frontage, rather than being disposed of at licensed grounds further out at sea.

If a beach replenishment scheme is to be effective, then the sediment placed should ideally be similar or slightly coarser in grain size when compared to the natural beach material. If the material is too fine, then it will become rapidly washed away by regular tidal action. If it is too coarse then it could alter the character of the existing beach.

To classify the sediment grain size of the dredged material, sediment samples were taken from four locations within the approach channel where dredging regularly takes place. These showed that a very large proportion of each sample was classed as ‘Very Fine Sand’ or ‘Fine Sand’ (between 67% and 92% of the sediments within each sample fell within these classes). Typically an effective beach replenishment scheme would use ‘Medium Sand’ or ‘Coarse Sand’ and a very low proportion of each sample possessed these class sizes.

This means that the dredged material is not well suited to a beach replenishment scheme at Redcar.

Technical Note 02 - Updated Beach Volume Changes

Technical Note 01 was produced in September 2011, providing a Coastal Processes Overview along the Tees Bay and Redcar frontages.

Its purpose was to provide a background description of the physical processes and morphological features within this study area and provide a basis for an assessment of the potential, or otherwise, for maintenance dredging activities by PD Teesport to affect beach processes in the vicinity of Coatham Sands and Redcar Sands.

Technical Note 01 concluded that the volumes of potentially beach-building dredged material are small in relation to natural variations in beach volume caused by seasonal wave and tide climates; and specific storm events. Furthermore, it identified by means of analysis of beach survey data that net accretion had occurred along Coatham Sands, Redcar

Sands, Marske Sands and Saltburn Sands between autumn 2008 and spring 2011, despite some 2,800,000m³ of maintenance dredging activity over that time (in 2009 and 2010).

Since that time the Redcar Sea Defence scheme has been completed and a series of further beach surveys has become available. This document, Technical Note 02, now provides an updated beach survey analysis to the most recent survey of spring 2013.

Coatham Sands

Coatham Sands is surveyed annually each autumn. The previous Technical Note reported that between autumn 2008 and autumn 2009 there was a large net gain of sediment (61,910m³) but between autumn 2009 and autumn 2010 there was a large net loss (-51,655m³). However, the overall change was a modest net gain between autumn 2008 and autumn 2010 of 10,255m³.

Since that time, there have been further surveys in autumn 2011 and autumn 2012, both reporting substantial net gains of sediment (149,715m³ and 100,605m³, respectively).

This shows that this frontage is subject to fluctuations in beach volume, but between autumn 2008 and autumn 2012 has experienced a significant volume of material influx, with a net gain of 260,575m³.

Redcar Sands

Redcar Sands is surveyed every 6 months, in autumn and spring of each year. The previous Technical Note reported that between autumn 2008 and spring 2011 there was a large net gain of sediment (66,365m³). This was achieved despite quite a high loss (-64,355m³) between spring 2010 and autumn 2010.

Since that time, the beach experienced 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.

This shows that this frontage is subject to fluctuations in beach volume, but between autumn 2008 and autumn 2012 has experienced a large volume of material, with a net gain of 113,150m³. Despite the net loss between autumn 2012 and spring 2013 of 84,660m³, the net change between the first and most recent surveys remains a net gain of 28,490m³.

Marske Sands

Marske Sands is surveyed annually each autumn. The previous Technical Note reported that between autumn 2008 and autumn 2009 there was a large net gain of sediment (54,210m³) but between autumn 2009 and autumn 2010 there was a large net loss (-40,765m³). However, the overall change was a modest net gain between autumn 2008 and autumn 2010 of 13,445m³.

Since that time, there have been further surveys in autumn 2011 and autumn 2012, both reporting substantial net gains of sediment (61,725m³ and 207,045m³, respectively).

This shows that this frontage is subject to fluctuations in beach volume, but between autumn 2008 and autumn 2012 has experienced a significant volume of material, with a net gain of 282,215m³.

Saltburn Sands

Saltburn Sands is surveyed every 6 months, in autumn and spring of each year. The previous Technical Note reported that between autumn 2008 and spring 2011 there was a modest net gain of sediment (9,245m³). This was achieved despite quite a high loss (-33,485m³) between autumn 2009 spring 2010.

Since that time, the beach experienced 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).

This shows that this frontage is subject to fluctuations in beach volume, but between autumn 2008 and autumn 2012 has experienced a large volume of material, with a net gain of 50,075m³. Given the large net loss experienced between autumn 2012 and spring 2013, however, the net change between the first and most recent surveys is a modest net loss of 10,780m³.

Overall

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 suggests that under typical conditions, the frontage is generally depositional, but particular seasons or particular 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 particular frontages, including Redcar, as part of natural seasonal patterns or storm-related responses.

6 IMPLICATIONS OF THE NEW INFORMATION

6.1 New information in relation to the SPA and Ramsar site

No new information of relevance to the SPA and Ramsar sites, and related to maintenance dredging operations, has been published during the current reporting period (2014).

6.2 New potential impacts upon the integrity of the SPA and Ramsar site

Under Regulation 35(3) of the Conservation of Species and Habitats Regulations 2010 (the 'Habitats Regulations'), Natural England has a duty to advise relevant authorities as to the conservation objectives for a EMS. Natural England's advice for the Teesmouth and Cleveland Coast EMS (English Nature, 2000), details the sites conservation objectives and provides information on how to recognise 'favourable condition' (as defined through the conservation objectives). Three conservation objectives apply to the Teesmouth and Cleveland coast SPA and Ramsar site.

1) For the internationally important populations of the regularly occurring Annex I bird species is as follows:

- Subject to natural change, maintain in favourable condition the habitats for the internationally important populations of the regularly occurring Annex 1 bird species, under the Birds Directive, in particular:
  - Sand and shingle;
  - Intertidal sandflat and mudflat; and,
  - Shallow coastal waters.

2) For the internationally important populations of the regularly occurring migratory bird species is as follows:

- Subject to natural change, maintain in favourable condition the habitats for the internationally important populations of the regularly occurring migratory bird species, under the Birds Directive, in particular:
  - Rocky shores;
  - Intertidal sandflat and mudflat; and,
  - Saltmarsh.

3) For the internationally important assemblage of waterfowl, the conservation objective is:

- Subject to natural change, maintain in favourable condition the habitats for the internationally important assemblage of waterbirds, under the Birds Directive, in particular:
  - Rocky shores;
  - Intertidal sandflat and mudflat; and,
  - Saltmarsh.

The relevant favourable condition targets for the SPA are presented in Table 6.1

Table 6-1 Favourable condition table for Teesmouth and Cleveland Coast SPA

Feature	Sub-feature	Attribute	Measure	Target	Comments
Internationally important populations of regularly occurring Annex 1 bird species (Little tern, Sandwich tern)		Disturbance	Reduction of displacement of birds	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline, subject to natural change	Significant disturbance to human activities can result in increased energy expenditure (flight and/or reduced food intake, displacement to areas of poorer feeding conditions)
		Extent and distribution of habitat	Area (ha) measured during reporting cycle	No decrease in extent from an established baseline, subject to natural change	These habitats provide both breeding and roosting sites for terns.
	Sand and Shingle	Vegetation characteristics	Predominantly open ground with sparse/short vegetation and bare surfaces (colonial nesting).	Vegetation height and density at nesting sites should not deviate significantly from an established baseline, subject to natural change.	Vegetation cover of <10% required throughput the areas used for nesting by little tern
	Intertidal sand and mudflats	Absence of obstructions to bird sight lines	Openness of terrain unrestricted by obstructions	No increase in obstructions to sight lines, subject to natural change	Sandwich tern require views >200m to allow early detection of predators at roost sites
	Shallow coastal waters	Food availability	Presence and abundance of marine fish, crustaceans, worms and molluscs. Measured periodically (frequency to be determined).	Presence and abundance of prey species should not deviate significantly from an established baseline, subject to natural change	Crustacea, annelids. Sandeel and sprats are important for little tern and Sandwich terns

Table 6.1 Favourable condition table for Teesmouth and Cleveland Coast SPA (cont.)

Feature	Sub-feature	Attribute	Measure	Target	Comments
Internationally important populations of regularly occurring migratory species knot (winter), redshank (autumn) and of the internationally important assemblage of waterbirds		Disturbance	Reduction or displacement of birds.	No significant reduction in numbers or displacement of wintering birds attributable to disturbance from an established baseline, subject to natural change	Significant disturbance attributable to human activities can result in reduced food intake and/or increased energy expenditure
		Extent and distribution of habitat	Area (ha) measured during reporting cycle	No decrease in extent from an established baseline, subject to natural change	Rocky shores have particular significance for feeding knot at Teesmouth. Existing saltmarsh habitats are mere remnants of those of the original Tees estuary
	Rocky Shores	Absence of obstructions to bird sight lines	Openness of terrain unrestricted by obstructions	No increase in obstructions to sight lines, subject to natural change	Waders require views over >200m to allow early detection of predators when feeding and roosting during the non-breeding season (at Teesmouth this is July-March inclusive)
		Food availability	Presence and abundance of surface and sub-surface invertebrates. Measured periodically (frequency to be determined)	Presence and abundance of prey species should not deviate significantly from an established baseline, subject to natural change	*Mytilus* spat are important prey for knot
	Intertidal sand and mudflats	Absence of obstructions to bird sight lines	Openness of terrain unrestricted by obstructions	No increase in obstructions to sight lines, subject to natural change	Waders require views over >200m to allow early detection of predators when feeding or roosting
		Food availability	Presence and abundance of surface and sub-surface invertebrates Measured periodically (frequency to be determined)	Presence and abundance of prey species should not deviate significantly from an established baseline, subject to natural change	Prey items include *Hydrobia*, *Macoma*, *Corophium*, *Nereis* (redshank and shelduck), *Macoma*, *Mytilus/Cerastoderma* spat, *Hydrobia* (knot), *Bathyporeia, Nerine, Mytilus*, wrack flies, sandhoppers (sanderling)

Table 6.1 Favourable condition table for Teesmouth and Cleveland Coast SPA (cont.)

Feature	Sub-feature	Attribute	Measure	Target	Comments
Internationally important populations of regularly occurring migratory species (knot (winter), redshank (autumn) and of the internationally important assemblage of waterbirds	Saltmarsh	Absence of obstructions to bird sight lines	Openness of terrain unrestricted by obstructions	No increase in obstructions to sight lines, subject to natural change	Waders require views over >200m to allow early detection of predators when feeding or roosting
		Vegetation characteristics	Open, short vegetation or bare ground predominating (feeding and roosting)	Vegetation height throughout areas should not deviate significantly from an established baseline, subject to natural change	Vegetation of <10cm is required throughput areas used for roosting
		Food availability	Presence and abundance of aquatic invertebrates, measured periodically (frequency to be determined)	Presence and abundance of prey species should not deviate significantly from an established baseline, subject to natural change	*Hydrobia, Corophium* are important for redshank, shelduck and teal. These habitats provide supplementary feeding opportunities especially at high water
			Presence and abundance of seed-bearing plants. Measure periodically (frequency to be determined)	Presence and abundance of food species should not deviate significantly from an established baseline, subject to natural change	*Salicornia* and *Atriplex* are important for teal during the non-breeding season (November – March) while *Salicornia* seeds may be taken by shelduck

As maintenance dredging practices have remained unchanged during the reporting period (2014) there is no potential for additional impacts on the interest features of the SPA or Ramsar site to have arisen. In addition, there is no new information presented in Section 5 for the current reporting period and, therefore, there are no implications for the interest features of the designated sites.

6.3 Conservation objectives

6.3.1 Conservation objective 1

The internationally important populations of little tern and sandwich tern addressed by conservation objective 1 are most likely to be affected by disturbance and habitat loss on areas of sand and shingle while nesting and roosting, and over shallow coastal waters while feeding. Sandwich tern also require views >200m to allow early detection of predators at roost sites. Of these factors, habitat loss through maintenance dredging activities could be considered most relevant; however, no loss of sand and shingle areas due to maintenance dredging has been shown during the reporting period. Similarly, there is little evidence to suggest that tern feeding success has been affected by dredger movements in the estuary or in Tees Bay, and sight lines across areas of intertidal sand and mudflats have not been affected by maintenance dredging activity.

6.3.2 Conservation objective 2

In terms of conservation objective 2 that relates to maintaining in favourable condition, the habitats of internationally important populations of regularly occurring migratory species; in particular, knot (winter), redshank (autumn), in areas of rocky shores, intertidal sandflat and mudflat, and saltmarsh, none of the sub-feature attributes (disturbance, extent and distribution of habitats, absence of obstructions to sight lines, or food availability) have been shown to be adversely affected during the reporting period by maintenance dredging.

The availability, abundance and species diversity of invertebrates in intertidal areas of mud and sand has not been shown to be affected by maintenance dredging activity. The potential for beneficial use of dredged arisings is subject to constant review so that these important habitats can be managed successfully for the benefit of the bird species that use them. Saltmarsh habitats in the Tees estuary are largely located to the north at Greatham Creek and the closest maintenance dredging activity commonly occurs approximately 3km downstream at the confluence of the Seaton Channel with the main river. The Environment Agency's Greatham Creek FAS managed realignment scheme has now been completed. Over time, this will increase the available area of mudflat and saltmarsh habitats within the estuary for bird species.

6.3.3 Conservation objective 3

With regard to conservation objective 3, maintaining favourable condition of the habitats for the internationally important assemblage of waterbirds particularly in areas of rocky shores, intertidal sandflat and mudflat, and saltmarsh, the observations above remain true. Saltmarsh habitats in the Tees estuary are largely located to the north at Greatham Creek and the closest maintenance dredging activity commonly occurs approximately 3km downstream at the confluence of the Seaton Channel with the main river. The Environment Agency's Greatham Creek FAS managed realignment scheme has now been completed. Over time, this will increase the available area of mudflat and saltmarsh habitats within the estuary for bird species.

7 THE WATER FRAMEWORK DIRECTIVE

7.1 Introduction

The Water Framework Directive (WFD) requires that Member States to aim to achieve good ecological and chemical status for surface water bodies and good qualitative and quantitative status for groundwater bodies by 2015. The WFD is implemented in England and Wales through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003, for which the Environment Agency is the competent authority. The Directive requires that the status of a water body is considered when all new activities in the water environment are planned.

The environmental objectives of the WFD fall under Article 4(1) of the Directive, which states:

"Member States shall protect, enhance and restore all bodies of surface water, subject to the application of subparagraph (iii) for artificial and heavily modified bodies of water, with the aim of achieving good surface water status at the latest 15 years after the date of entry into force of this Directive."

Through the production of 'River Basin Management Plans', environmental objectives have been set for all surface and ground waters in England and Wales to enable them to achieve good ecological status (or good ecological potential for heavily modified/artificial water bodies).

The following sections detail the current status of, and pressures upon, those water bodies in the vicinity of the maintenance dredging operations. Actions identified within the Northumbria River Basin Management Plan (RBMP) (Environment Agency, 2009), and those being implemented, are also discussed.

7.2 Tees Transitional Water Body (GB510302509900)

7.2.1 Current status

The Tees transitional water body is currently designated as a Heavily Modified Water Body (HMWB) for reasons of flood protection and navigation. Given its status as a HMWB, the Tees transitional water body is required to meet Good Ecological Potential (GEP) and good surface water chemical status by 2027. Annex B of the Northumbria RBMP (Environment Agency, 2009) states that the current status of the Tees transitional water body is Moderate Ecological Potential.

Tables 7.1 and 7.2 list those water body elements which are at less than 'good' status.

Table 7-1 Tees TraC water body elements which are less than good ecological potential

Element	Current status (and certainty of less than good)	Predicted Status by 2015	Justification for not achieving good status by 2015
Biological Elements			
Macroalgae	Moderate (uncertain)	Moderate	Disproportionately expensive (B1a)
Chemical Elements			
Dissolved inorganic nitrogen	Moderate (uncertain)	Moderate	Disproportionately expensive (N1c)
Phenol	Moderate (uncertain)	Moderate	Technically infeasible (C2a)
Supporting conditions			
Tidal regime – freshwater flow	Does not support good (very certain)	Does not support good	Disproportionately expensive (HT3a)

Table 7-2 Tees TraC water body elements which are less than good chemical status

Element	Current status (and certainty of less than good)	Predicted Status by 2015	Justification for not achieving good status by 2015
Chemical Elements			
Tributyltin Compounds	Moderate (quite certain)	Moderate	Technically infeasible (C2a)

A number of mitigation measures which have a defined ecological potential and that are relevant to maintenance dredging activities are currently in place within this water body. These include:

- Reduce impact of dredging;
- Preparing a dredging/disposal strategy;
- Reduce sediment re-suspension; and
- Alter timing of dredging/disposal.

7.2.2 Pressures

Annex G of the Northumbria RBMP (Environment Agency, 2009) provides a summary of the significant pressures and the risks resulting from human activities on the status of surface water and groundwater. Within these pressures those that are relevant to the maintenance dredging include:

- Physical modification (morphology) including land claim, shoreline reinforcement, and dredging activities.
- Indirect effects of sediment from current and historic point and diffuse sources of pollution.

7.2.3 Actions

Annex C of the Northumbria RBMP (Environment Agency, 2009) identifies actions that are already taking place within the River Basin District and also further actions and when it is planned to achieve these. Those that are relevant to maintenance dredging include:

- Dredging (sediment management): Apply national guidance framework on dredging and disposal of dredgings to provide guidance to all those undertaking or permitting navigation dredging and disposal activities to assist in achieving the objectives of the WFD and related EQS directive (2008/105/EEC) and refine local measures as appropriate (where not disproportionately costly or technically infeasible).
- Ports, harbours and navigation authorities to prepare a dredging and disposal strategy, such as this baseline document as recommended under the Maintenance Dredging Protocol.
- Apply national guidance framework on dredging/disposal of dredgings to refine local measures as appropriate (where not disproportionately costly or technically infeasible).
- Sediment monitoring, modelling and bioaccumulation studies on heavy metals which may be related to sediment movements.

Permission must be sought from the Environment Agency, via an assessment, to ensure that the dredging is in compliance with the WFD, with no deterioration to the existing status of the water body.

All of the above actions have been addressed either within the Northern Gateway Container Terminal Environmental Statement (Royal Haskoning, 2006), QEII Berth Development Environmental Statement (QEII ES) (Royal Haskoning, 2009b), Tees Dock No.1 Quay Environmental Statement (Royal HaskoningDHV, 2012) or will be addressed through the regular update of the Tees Maintenance Dredging Protocol by PD Teesport, of which this review document forms an integral part.

Although dredging operations may have the potential to affect the extent of marginal habitats and levels and dispersal of suspended sediment in the river, it is not considered that maintenance dredging at current permitted levels has any impact upon marginal habitat. Where appropriate, the beneficial use of dredged arisings should be intended to deliver a significant improvement to marginal habitat in the wider Tees transitional water body.

7.3 Consideration of maintenance dredging activities under the WFD

In April 2010, the Environment Agency published draft guidance entitled 'Clearing the waters: A user guide for marine dredging activities' (Environment Agency, 2012), developed in association with the UK Major Ports Group, the British Ports Association and other interested parties.

Stage 1 of the process (Screening) applies to pre-existing (maintenance) dredging and associated disposal activities. Pre-existing means those which were started or ongoing during the period 2006 – 2008, the period when the classification of water bodies was being undertaken by the Environment Agency. As such, the Environment Agency considers that it has taken account of any significant effects or impacts upon status from activities undertaken during this

period. Assuming there have been no significant changes and that no new information about impacts has become available, the continuation of the dredging or disposal activity should not cause deterioration in water body status.

The screening process therefore allows ongoing maintenance dredging and disposal activities to be 'screened-out' of further assessment as those activities will not cause deterioration or failure of the water body to meet its WFD objectives.

No means have been identified by which the current maintenance dredging regime can adversely affect the overall estuary morphology and the ongoing morphological processes at work. Equally maintenance dredging at current permitted levels within the Tees transitional water body will have no significant impact on its marine ecology or marine water and sediment quality. It can therefore be concluded that maintenance dredging activities undertaken at currently permitted levels will have no significant impact upon the status of the Tees transitional water body.

7.4 In-combination impacts

Due to the global financial downturn of late 2008 and 2009 a number of development proposals on the Tees estuary have been postponed prior to formal applications being made (see Section 4). The extent of maintenance dredging on the estuary is therefore expected to increase within the limits and conditions of existing consents for the foreseeable future and no change to the extent or type of in-combination impacts previously identified is expected to occur.

8 CHANGES TO PREVIOUS RECOMMENDATIONS

Previous recommendations regarding the management and mitigation of potential effects on the Tees and Cleveland Coast SPA and Ramsar site were presented in Section 5 of the Baseline Document (Royal Haskoning, 2008). The Baseline Document identified that maintenance dredging has the potential to affect the SPA and Ramsar site through the following parameters:

- Changes to habitats as a result of hydrodynamic change leading to changes in the morphology of the estuary.
- Increases in levels of suspended sediment during dredging operations. This could potentially impact on the food resource of the SPA interest features; particular the little tern which feeds on sandeels and small fish in the mouth of the estuary.
- The remobilisation and redistribution of sediments which may be contaminated within the study area. These sediments could potentially impact on the intertidal benthic organisms used by the waterbirds as a feeding resource.
- Increased disturbance. Potentially, an increase in noise levels could impact on SPA waterbird populations. This is of particular concern during the winter period when waterbirds feed and gather energy.

The Baseline Document discussed the potential for direct and indirect impacts of the following:

- Maintenance dredging on the morphology of the SPA.
- The resuspension of contaminated sediment.
- Changes in water quality.
- Noise disturbance of waterbird species.

The Baseline Document 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 upon the designated site which would alter its condition. From the condition assessments provided for the Sites of Special Scientific Interest (SSSIs), it was assumed that the majority of the SPA would be deemed to be in favourable condition, with the exception of Seal Sands.

The Baseline Document recommended that these conclusions must be reviewed if a significant change in maintenance dredging practices should occur as a result of new developments. Of particular note were the issues associated with the deposition of sediment on Seal Sands and the possible changes to the growth of Enteromorpha mats by altering the sediment transport pathways. Although it was considered unlikely that the existing maintenance dredging was having a significant impact on these mats, as part of a wider estuary project, monitoring proposals had been developed as part of the capital dredge for Seaton Channel. These proposals were designed to monitor the sedimentation issue over a period of five years. They provided an opportunity to discuss the results and any possible working practices which could be adopted to alter any impacts measured. For example, the existing working practices in Seaton Channel may be altered as a result of this monitoring.

Section 6 of the NGCT Environmental Statement (ES) (Royal Haskoning, 2006) predicted that, as a consequence of the capital dredging in the lower reaches of the estuary, some deposition of material re-suspended by the dredging will occur on Seal Sands. This area is particularly of concern due to its designated status and the potential impact of the deposited sediment on the feeding resource of waterbirds. Ways in which this potential effect will be managed were detailed in Section 4.3 of the ES (Royal Haskoning, 2006).

Within the NGCT ES, the area of concern with regard to potential in-combination effects related to the requirement for maintenance dredging to be undertaken during the capital works. This was discussed in more detail in the Supplementary Report (Royal Haskoning, 2007a) and predicted that in-combination effects were not significantly different from those predicted as a consequence of the capital dredging alone.

In-combination studies were undertaken for other relevant projects and plans and were presented in the NGCT ES. Since it was concluded that the proposed scheme did not have the potential to result in a significant in-combination effect with the other plans or projects, the management of the combined effects of these projects do not form part of the dredging protocol (Royal Haskoning, 2007b).

Dredging activity in the Seaton Channel since 2007 has removed a large volume of sediment from the bed of the channel; however, the width of the channel has not been significantly affected and the area of most activity has been at the head of the channel in the vicinity of the Able (UK) yard rather than at the confluence of the Seaton Channel with the main river channel. Subsequently, the North Gare Sands are not considered to be at additional risk as a result although

Seal Sands may be at a higher risk as a result of these dredging operations. The proposed sediment monitoring plan, undertaken by Able (UK) as part of the Seaton Channel capital dredge (see above), was intended to identify any unexpected change or adverse effect to the sedimentary regime at this location.

The proposed dredging operations in relation to the QEII Berth Development have been subject to a number of conditions to allow for consent to be granted. This includes the use of a sealed bucket or grab dredger and also sealed barges for the dredging of unconsolidated contaminated sediments. These measures were discussed in detail with both the Regulatory Authorities and Statutory Consultees; and a Dredging Plan for the QEII berth was produced (Royal Haskoning, 2009c). The Dredging Plan outlines the mitigation measures most appropriate for the proposed dredging operations and, as such, it was possible to conclude that on adoption of such measures, no adverse effect upon the integrity of the Teesmouth and Cleveland Coast SPA was predicted from these operations.

The proposed dredging operations in relation to the Tees Dock No.1 Quay Development are subject to the following condition.

"The Licence Holder must employ the use of a backhoe dredge to minimise resuspension of sediment during dredging operations. The use of a trailing suction hopper dredger is permitted in cases of minor dredging."

With the inclusion of this condition and the mitigation measures set out within the ES (Royal HaskoningDHV, 2012) it was possible to conclude that no adverse effect upon the integrity of the Teesmouth and Cleveland Coast SPA was predicted from these operations.

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