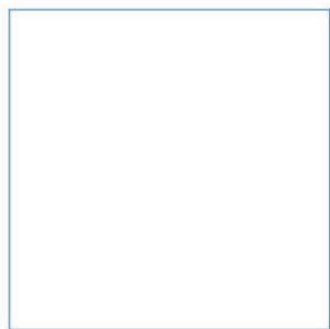
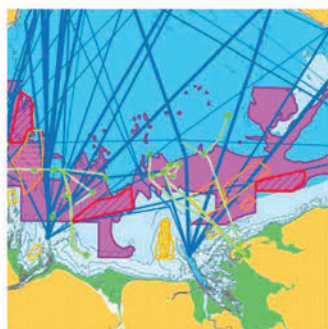
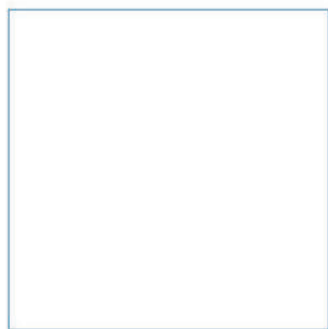
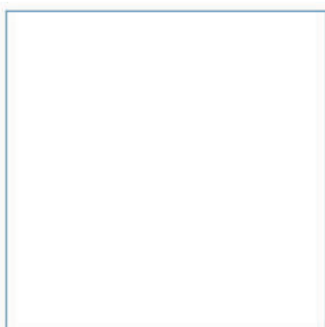


ABP Southampton

Southampton Maintenance Dredge Protocol Update Baseline Document

May 2025



Innovative Thinking - Sustainable Solutions

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Southampton Maintenance Dredge Protocol Update

Baseline Document

May 2025



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Executive Summary

Associated British Ports (ABP) Southampton, the Statutory Harbour Authority (SHA) for Southampton Water and Solent Channels, has commissioned ABPmer to compile an updated Maintenance Dredge Protocol (MDP) Baseline Document. The MDP collates readily available relevant information into a Baseline Document to assist operators and regulators seeking, or giving approval, for maintenance dredging activities that could potentially affect European designated sites. The main objectives are as follows:

- To provide the relevant information to allow Natural England to consider and endorse an Appropriate Assessment (AA); and
- To provide the information needed to inform the preparation of Water Framework Directive (WFD) compliance assessments in accordance with the Environment Agency's 'Clearing the Waters for All' guidance.

This Baseline Document will not require substantial revision unless major changes are proposed or if significant new information becomes available. In such a case, this document will be updated to reflect these changes.

Southampton Water is one of the busiest waterways in the United Kingdom, with around 62,000 vessel movements in 2024. ABP Southampton is located at a strategic position on the central south coast of England, in close proximity to the international shipping lanes and Continental Europe. The Port also has shipping links with over 100 countries and is one of the busiest and most diverse in the UK, with some 31 million tonnes of cargo handled per annum making it the fourth largest port in the UK by tonnage (DfT, 2024).

The lower tidal sections of the Rivers Test and Itchen, Southampton Water and the Central Solent are regularly maintenance dredged by both ABP and third parties. The average volume of maintenance dredging which has been undertaken by ABP Southampton between 2015 and 2024 is 314,520 m³ per year.

Southampton Water and the Central Solent is surrounded by areas of high nature conservation importance, with large areas of the estuary and the adjacent coastline having been designated as nationally and internationally protected sites. The European/Ramsar sites which overlap or in the vicinity of the maintenance dredge operations and relevant licensed marine disposal sites, are as follows:

- Solent and Dorset Coast SPA;
- Solent and Southampton Water SPA;
- Solent and Southampton Water Ramsar site;
- Solent Maritime SAC;
- River Itchen SAC; and
- South Wight Maritime SAC.

As maintenance dredging and disposal are licensable activities that are neither directly connected with nor necessary to the management of these European/Ramsar sites, they are considered to have the potential to result in a likely significant effect (LSE) on these sites. The potential impacts on the relevant interest features and conservation objectives of these sites have been assessed in the context of the nature and scale of the maintenance dredge and disposal activities. The geographic location of the proposed ongoing maintenance dredge and disposal activities relative to the distribution

of the interest features, their supporting habitats and prey distribution, and the sensitivities of the interest features to these environmental pressures/changes have also been considered. Based on available evidence, it is concluded that there is no potential for an AEOI of the interest features or conservation objectives of any European/Ramsar sites either alone and/or in-combination with other plans and projects.

Maintenance dredging and disposal activities take place within WFD water bodies. The activity is considered not likely to have a permanent effect on the status of WFD parameters at water body level. The maintenance dredging and disposal activities will not cause deterioration in the status of quality elements in any WFD water body nor would the works prevent any water body from achieving WFD status objectives.

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1 Introduction

1.1 Background

Southampton Water is one of the busiest waterways in the United Kingdom, with around 62,000 vessel movements in 2024. The vast majority of the estuary is open water, with navigation buoys and one light float marking the main navigable channel. The major operating port within the estuary is ABP Port of Southampton (which has been termed ABP Southampton within this Baseline Document).

The Port benefits from its geographical advantage on the south coast. It is a deep-water port which can handle the world's largest ships. The Port is located adjacent to the main international shipping lanes and is a favoured port for all cargo sectors travelling by sea as part of global trading activity. In this respect, Southampton is critical national infrastructure. The Port also has shipping links with over 100 countries and is one of the busiest and most diverse in the UK, with some 31 million tonnes of cargo handled per annum making it the fourth largest port in the UK by tonnage. (DfT, 2024).

The Port is home to the country's most productive deep sea container terminal, the UK's number one automotive export port and Europe's leading turnaround cruise port welcoming 3 million passengers annually through five cruise terminals. The Red Funnel Isle of Wight ferry operation also handles 3.5 million passenger movements and 1.0 million vehicle movements every year. The Port supports 45,600 jobs and contributes £2.5 billion to the nation's economy every year. As one of the country's largest import ports handling over £71 billion of goods per annum and as the UK's number one export Port, Southampton handle exports worth £40 billion annually, including £36 billion destined for markets outside the European Union. The Port is at the heart of supply chains flowing between the UK and the rest of the world supporting manufacturers and businesses throughout Britain, including the automotive sector where the Port supports 11,700 jobs in the West Midlands alone.

In 2023, ABP acquired Solent Gateway Limited, which has a Concession Agreement to operate Marchwood Port on behalf of the Defence Infrastructure Estates (DIO) until 2051. Marchwood Port has a role in transporting material on behalf of the UK's armed forces across the world as well as receiving commercial goods.

In addition to ABP Southampton's commercial operations, Southampton Water is also home to the Exxon Mobil Esso Terminal at Fawley and BP's Hamble Jetty Terminal. On the River Itchen various aggregate wharfs are operated by Tarmac, Hanson and EMR. The estuary is also heavily used by recreational clubs and individuals for leisure activities. A large proportion of recreational vessel movements occur with scheduled yacht races and vessels cruising between the network of marinas, moorings and anchorages within the estuary and rivers.

ABP Southampton is the Statutory Harbour Authority (SHA) for Southampton Water, the tidal Rivers Test and Itchen, and part of the Central Solent. The River Hamble has its own Harbour Authority, which oversees the management of the river. Maintaining safe port access for commercial and recreational maritime transport is an important function for Harbour Authorities. This necessitates the maintenance dredging of access channels and berth pockets to remove recently deposited sediment. Most of the dredging occurs along the main navigation channel and berth pockets along Southampton Water and the tidal Rivers Test and Itchen.

Southampton Water is a relatively narrow and spit-enclosed meso-tidal estuary, subject to very limited wave action and draining a catchment of around 1,630 km² (ABPmer, 2007a). The estuary is constrained between the Solent and the confluences of the Rivers Test and Itchen as a result of anthropogenic

infrastructure (including seawalls, quaysides, dock estate etc.), with the landward terrain typically rising sharply from the High Water (HW) mark. The estuary was formed by the Rivers Test and Itchen which flow in from the north, plus the River Hamble that flows in from the east. Dock Head marks the confluence of the Rivers Test and Itchen, from which Southampton Water commences until its junction with the Solent at Calshot (see Figure 1 and Figure 2).

1.2 Objectives

This updated Baseline Document has been prepared in order to comply with the requirements of the Conservation Assessment Protocol for maintenance dredging, with respect to 'Conservation of Habitats and Species Regulations 2017 (as amended)', (commonly referred to as the 'Habitats Regulations')¹. It is the Government's view, supported by rulings in the European Court of Justice, that maintenance dredging should be considered as a 'plan or project' for the purposes of the Habitats Regulations (Defra, 2017). A requirement therefore exists to ensure that maintenance dredging operations with the potential to affect European/Ramsar sites are considered in a wider sediment management context. The aim of the protocol is to collate relevant information into a Baseline Document to make the process of assessing the effect of maintenance dredging more explicit for all parties.

To fulfil this obligation ABP Southampton, as the SHA for Southampton, commissioned ABPmer to prepare the original Baseline Document in 2014 (ABPmer, 2014), which was subsequently updated by in 2016 (ABPmer, 2016). This revision has been prepared by ABPmer, updating the Baseline Document with available data up to 2024 inclusive.

The Baseline Document and subsequent updates have been prepared following the guidance provided in the Department for Food and Rural Affairs (Defra) Maintenance Dredging and The Habitats Regulations 1994 'A conservation Assessment Protocol for England'. This Baseline Document aims to provide all parties wishing to carry out maintenance dredging within the study area with the relevant baseline information to inform Habitats Regulations Assessments (HRAs), Water Framework Directive (WFD) compliance assessments and Marine Conservation Zone (MCZ) assessments where these are required.

The Baseline Document therefore provides a basis for the licensing authority to consider maintenance dredge applications. At the outset of the baseline data compilation, it was recognised that maintenance dredging has been an ongoing activity within the SHA area for the safe navigation and berthing of ships for over two centuries (ABPmer 2024a). Historically, dredge disposal activities have been licensed by the regulator, currently the Marine Management Organisation (MMO). The presumption, in assessing any potential consequences of maintenance dredging and disposal activities, is that these activities will continue in line with established practice. To establish the current baseline, this Baseline Document has drawn on existing and readily available information, and presents the current and historical patterns of dredging in relation to the conservation status of designated sites (namely European/Ramsar sites and Marine Conservation Zones (MCZs)). All available data has been presented, noting that this is an updated and therefore new baseline document that supersedes any previous versions.

¹ Following the UK leaving the EU, these have been modified by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

1.3 Study area

The study area covers all of the SHA area which comprises the Central Solent, Southampton Water, the tidal part of the River Itchen and the lower tidal part of the River Test downstream from the Redbridge Causeway as shown on Figure 1 .

In addition to the SHA, this Baseline Document also includes the Nab Channel within the context of the study area given ABP Southampton's need to maintain navigable depths within the approaches to the Eastern Solent (Figure 2).

It should be noted that the Hamble Harbour Authority is a separate authority with its own defined SHA area that includes part of Southampton Water around the mouth of the River Hamble. This area is not considered by this Baseline Document. Similarly, Cowes Harbour Commissioners SHA area extends from the Medina Estuary and adjoins the ABP Southampton SHA area in the Central Solent. This area is also not considered by the Baseline Document.

There are several ABP maintenance dredge areas within the SHA area that are grouped into four main areas as follows: the Test Berths and Channels; Itchen Berths and Channels; Southampton Water; and the Solent Channels (Figure 3).

1.3.1 Test berths and channels

The Test Berths and Channels maintenance dredge area covers the lower tidal part of the River Test and contains a number of berths and dredge areas which are illustrated as the orange area in Figure 4. These include:

- Southampton Container Terminal (SCT) berths and approaches;
- Western Docks and approaches;
- Dock Head berths; and
- Test channel and turning areas.

Areas that are dredged by third parties are also shown on Figure 4. Marchwood Port will be maintenance dredged by ABP Southampton in future following the acquisition of Solent Gateway Ltd by ABP in 2023.

The dredge depths of the areas maintained by ABP Southampton vary between 9 m and 16.5 m below Chart Datum (CD) in the dock berths, and between 6 m and 13.2 m below CD within the turning areas and navigation channel. The areas that have been deepened or widened over the years are detailed in Section 3.1.3.

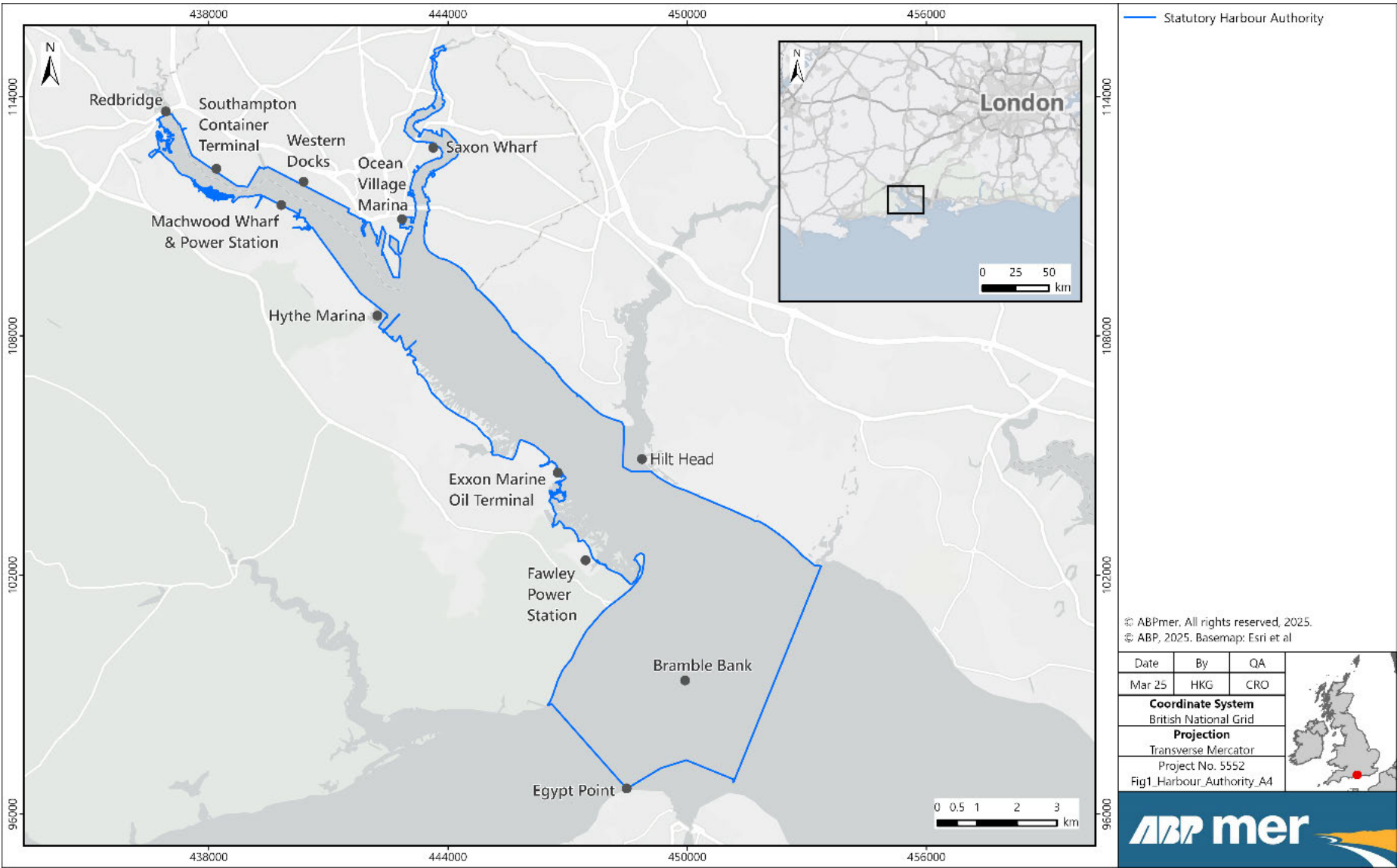


Figure 1. ABP Southampton's SHA area

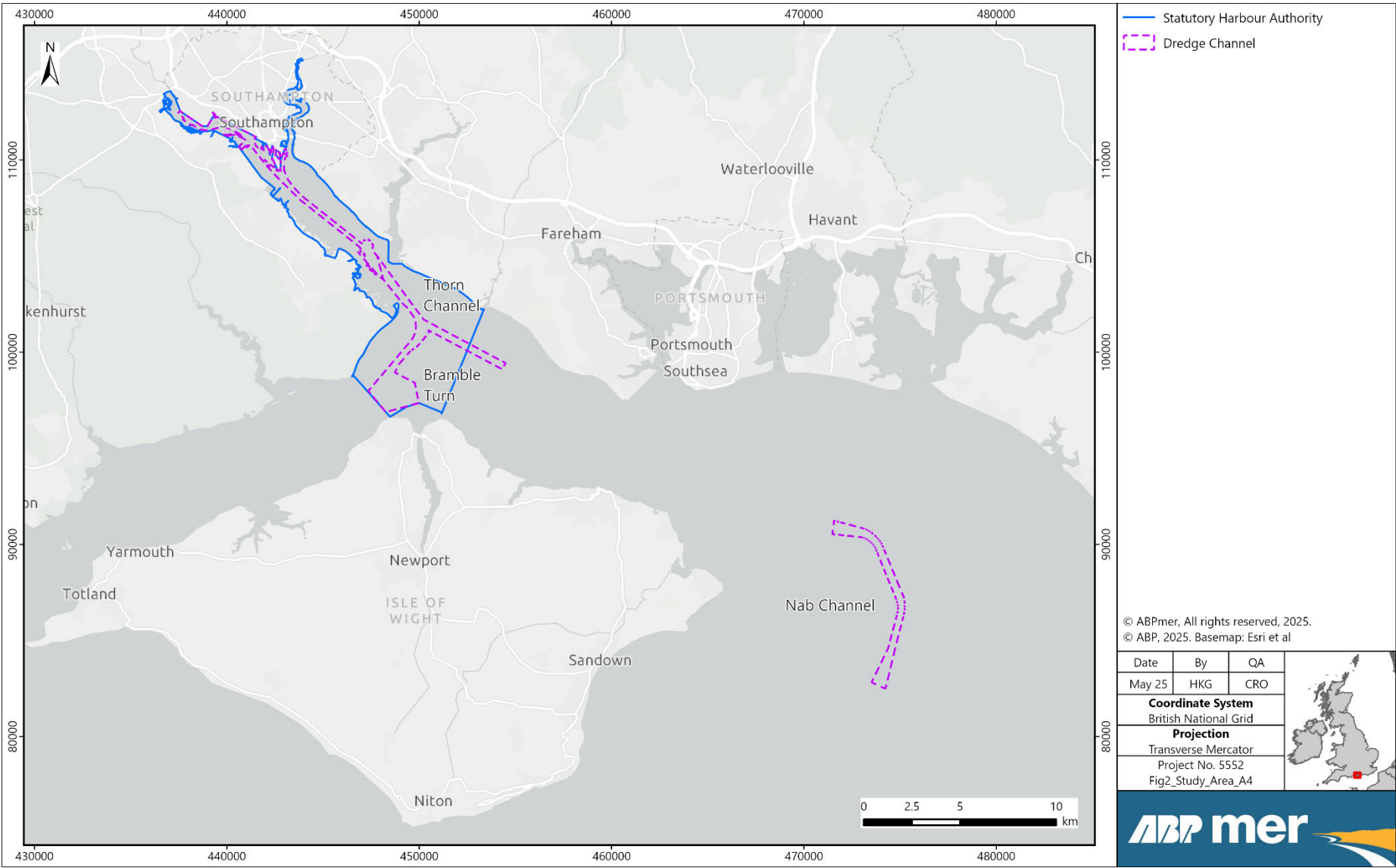


Figure 2. Study Area

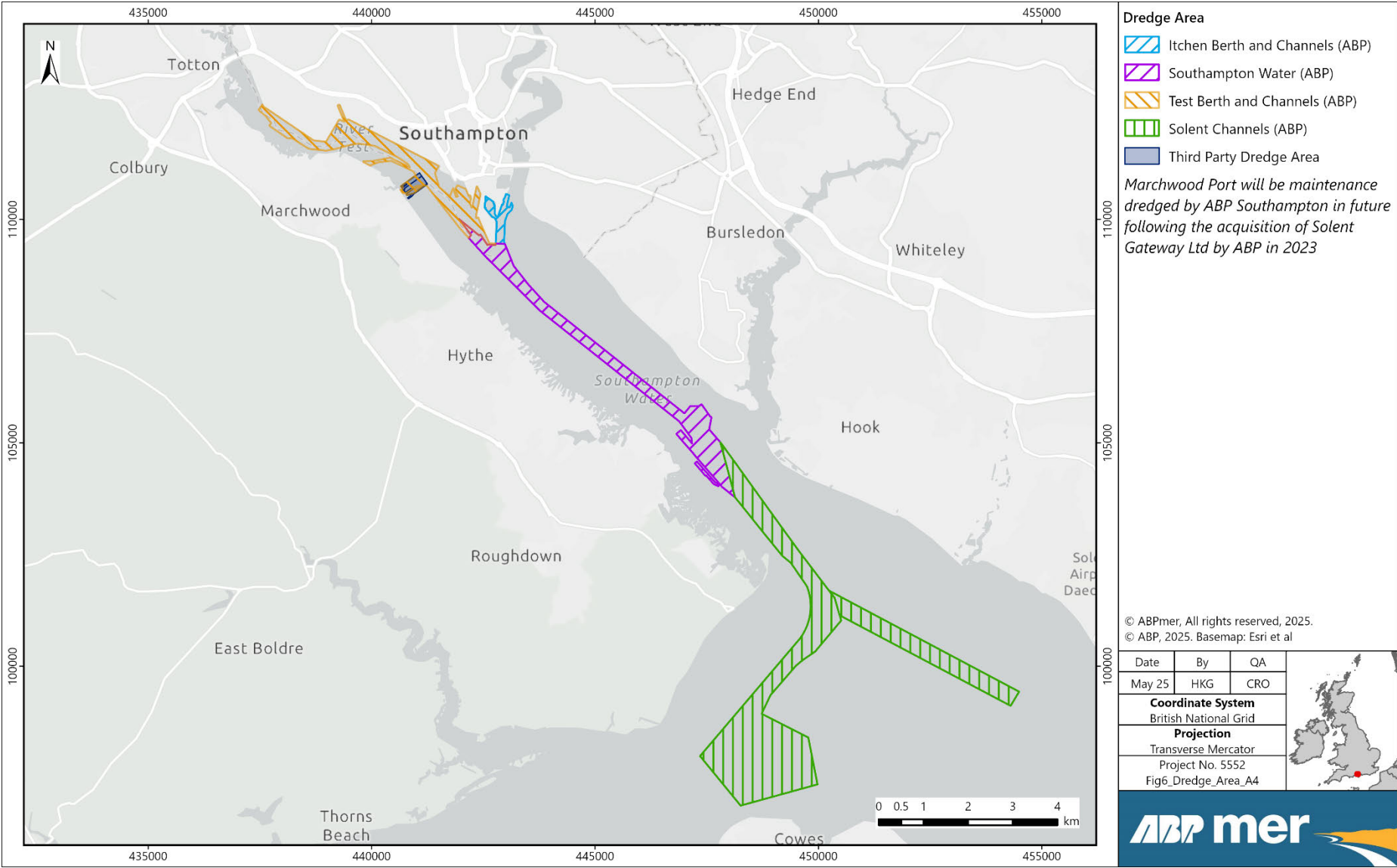


Figure 3. ABP maintenance dredge areas that overlap the SHA area

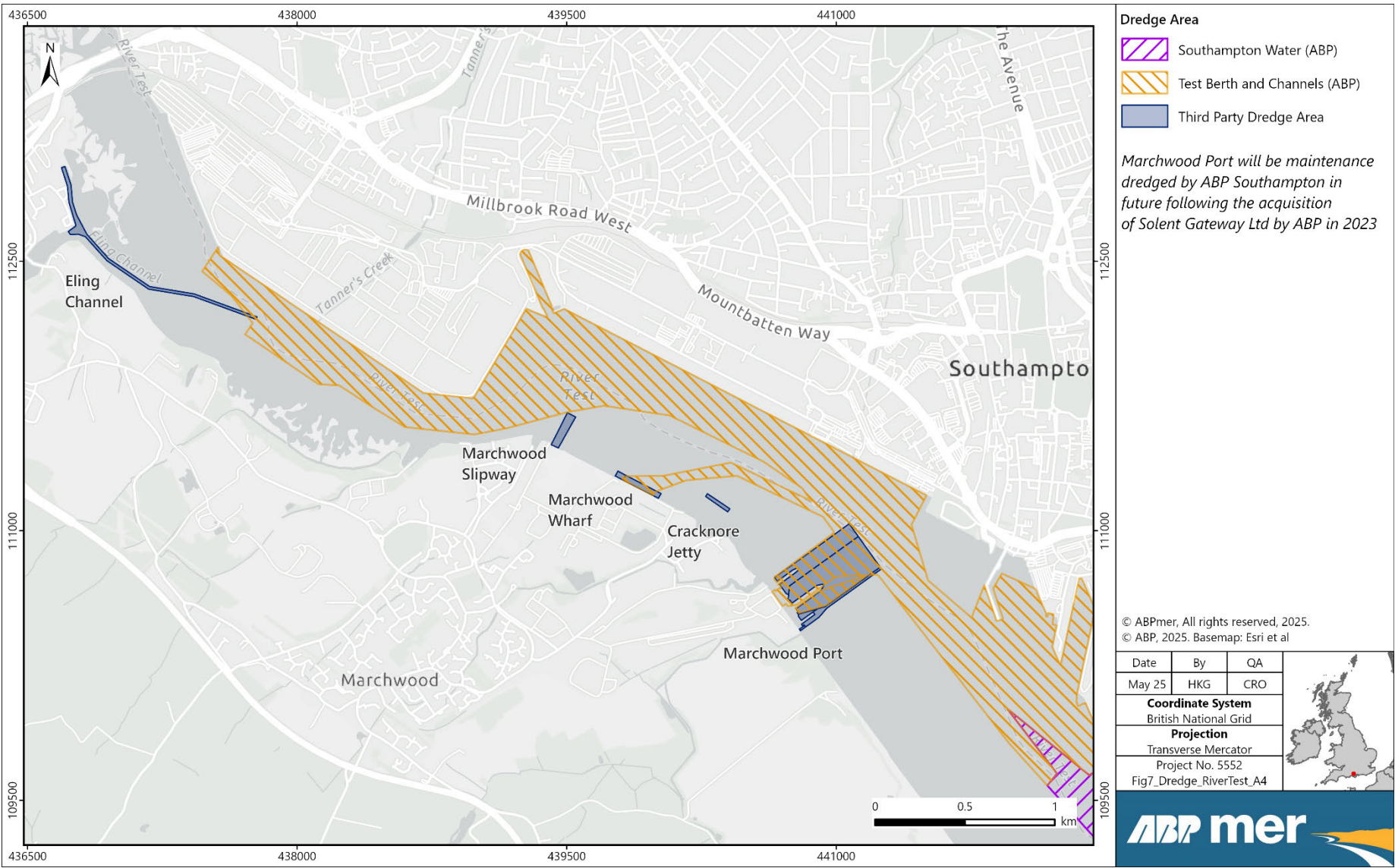


Figure 4. Dredge areas within the lower tidal part of the River Test

1.3.2 Itchen berths and channels

The Itchen Berths and Channels maintenance dredge area covers the lower tidal stretch of the River Itchen and again contains a number of docks and dredge areas which are illustrated as the light blue area in Figure 5 , these include:

- Empress Dock and approaches;
- Dock Head berths (Nos. 34 to 36); and
- Itchen channel.

Areas that are dredged by third parties are also shown on Figure 5.

The dredge depths of the areas maintained by ABP Southampton vary between 5.6 m and 9.9 m below CD in the dock berths and approaches. The Itchen channel is maintained at 9.1 m below CD.

1.3.3 Southampton Water

The Southampton Water maintenance dredge area extends from Dock Head in the north to approximately Fawley in the south. This dredge area comprises the main navigation channel and is illustrated as the purple area in Figure 6 .

Areas that are dredged by third parties are also shown on Figure 6.

The main channel within the Southampton Water dredge area is currently maintained at 13.6 m below CD, with the exception of the Upper Esso Dredge Area at the Cadland Buoy. The main channel above Hook is maintained at 13.2 m below CD where possible. The area around the Perenco pipeline which crosses Southampton Water is limited at 12.6 m below CD.

1.3.4 Solent Channels

The Solent Channels maintenance dredge area covers the area between the Solent Channels in the north and Bramble Turn in the south (Figure 7). This dredge area comprises a secondary channel referred to as the North Channel, which is a shallow draught approach channel maintained at 4.5 m below CD. This secondary channel is lower priority to the main navigation channels (i.e., the Thorn Channel and Brambles Turn) which are currently maintained at 13.6 m below CD.

1.4 Capital and maintenance dredging

Marine navigational dredging (both maintenance and capital dredging) are frequent activities within Southampton Water and the lower tidal parts of the Rivers Test and Itchen. Maintenance dredging is the regular and routine removal of sediment from berths and channels to maintain the charted and operational depths which are safe for vessel navigation. Capital dredging responds to an operating or commercial need to create new, or to deepen or widen existing, berths, approaches or channels (e.g. to accommodate larger ships).

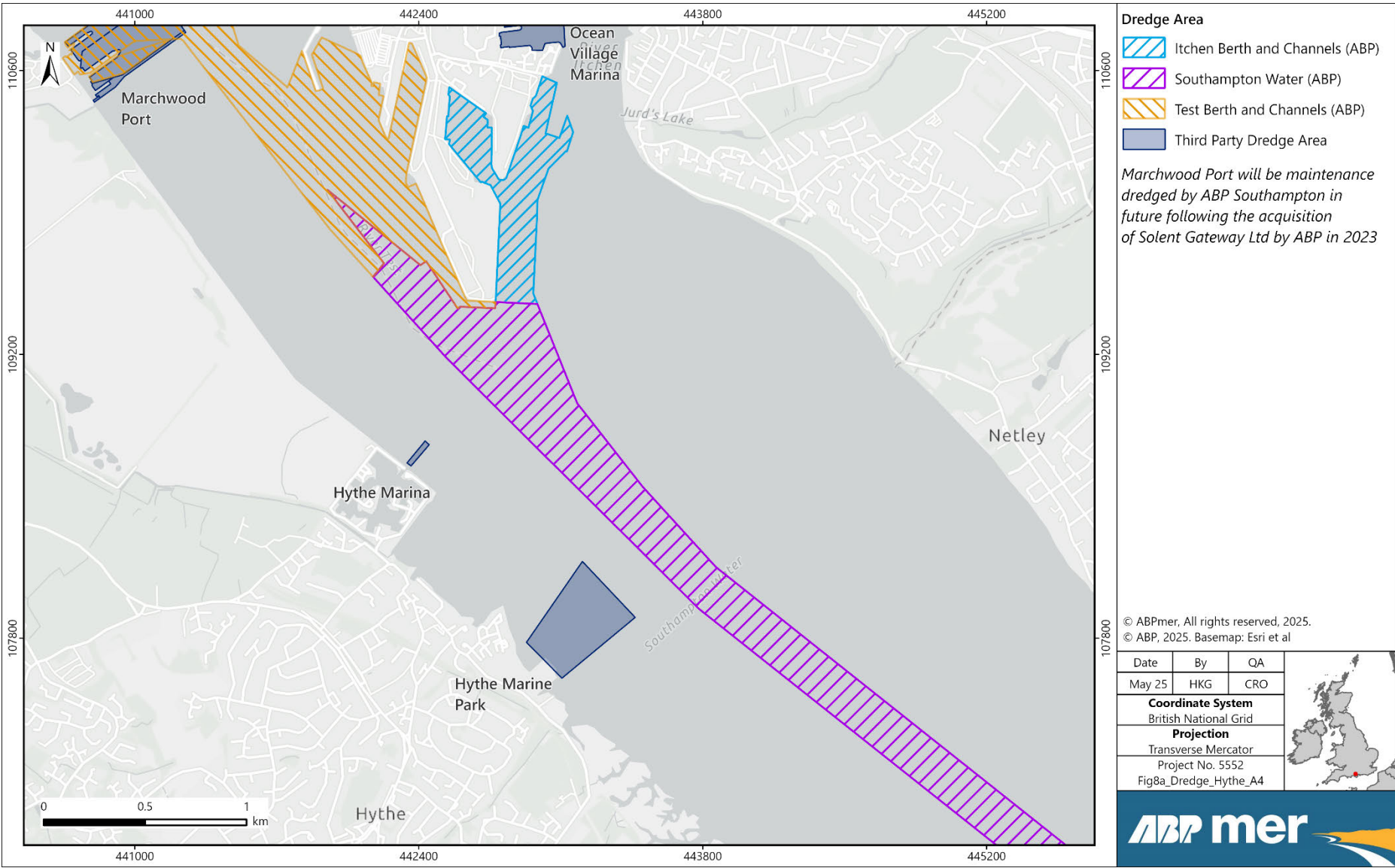


Figure 5. Dredge areas within lower tidal part of the River Itchen

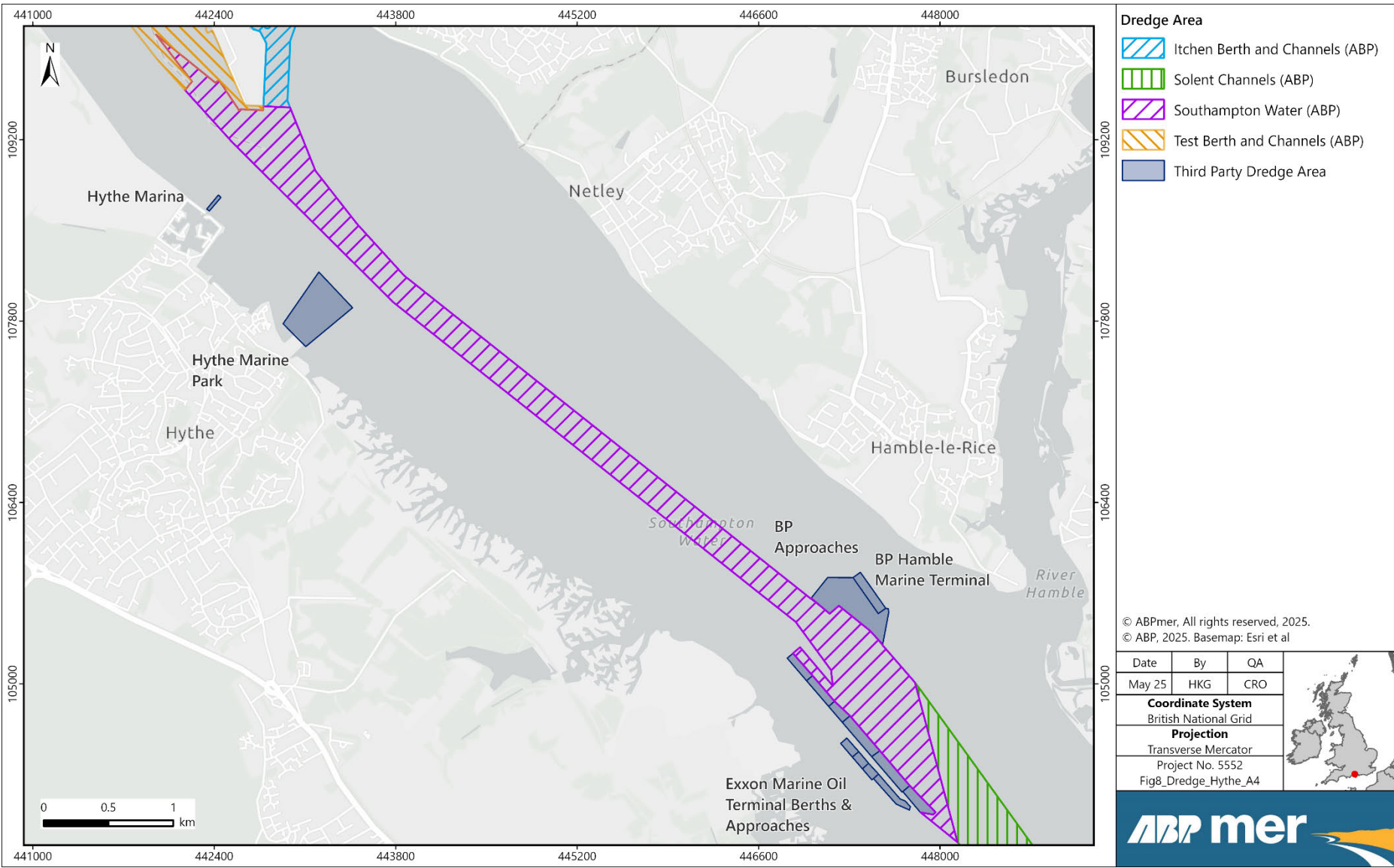


Figure 6. Dredge areas within Southampton Water



Figure 7. Dredge areas in the lower part of Southampton Water and Central Solent

1.5 Report structure

This Baseline Document is structured as follows:

- Section 1: Provides background to the requirement for this Baseline Document, the scope and objectives of the report, and the study area that is covered;
- Section 2: Details the legislation context behind the Maintenance Dredge Protocol (MDP) and the Marine Navigation Dredging Framework;
- Section 3: Outlines relevant coastal, estuarine and morphological processes for the study area;
- Section 4: Details the current dredging and disposal practices;
- Section 5: Contains information relating to sediment quality and presents an overall assessment of sediment quality from previous licence applications;
- Section 6: Summarises licence information and presents information from monitoring exercises; and
- Section 7: Outlines key environmental information for the study area, including protected sites and interest features, and also WFD water bodies and their current status

2 Legislation

Marine navigation dredging and disposal at sea are highly regulated activities due to their potential to affect the environment if they are not carefully considered and controlled. The following section details the legislative context in which this Baseline Document has been drafted.

2.1 Marine Licensing

Dredging and disposal activities are regulated in England by the MMO, an executive non-departmental public body (NDPB) established and given powers under the Marine and Coastal Access Act 2009. The marine licensing process requires anybody wishing to undertake works below Mean High Water Springs (MHWS) which are deemed to involve a licensable activity to obtain a Marine Licence from the MMO, unless the activity qualifies for an exemption from marine licensing.

The Marine and Coastal Access Act 2009 and the Marine Licensing (Exempted Activities) Order 2011 (as amended) set out activities which may be exempt from requiring a Marine Licence in certain circumstances. This includes certain dredging activities carried out by, or on behalf of, a Harbour Authority, which involves the relocation of sediments inside surface waters, including for the purpose of managing waters and waterways (Section 2.5). The activity must be authorised by a local Act or harbour order and the authority must demonstrate to the MMO's satisfaction that the sediments are non-hazardous. Similarly, small-scale navigational dredging (removing under 500 m³ dredge material per campaign and under 1,500 m³ per annum; referred to as '*de minimus*' dredging) carried out for navigational purposes in an area that has been dredged at least once in the preceding ten years is exempted from the requirements of a Marine Licence.

It should be noted that while certain dredging activities are exempted from requiring a Marine Licence to be issued by the MMO, the activity of disposing dredged material at sea (i.e. conventional disposal of dredge arisings at a licensed marine disposal site) requires a separate Marine Licence.

2.2 Habitats Regulations

The UK Government considers that maintenance dredging proposals, which could potentially affect a European/Ramsar site, need assessing in accordance with the Habitats Regulations (Defra, 2017). In effect this means that ongoing maintenance dredging should be considered as a relevant 'plan or project' and requires its effects on the European/Ramsar sites to be considered prior to any consent being granted.

Regulation 63 of the Habitats Regulations requires the competent authority, in this case the MMO, to determine whether the proposed works have the potential for a likely significant effect (LSE) on a European/Ramsar site and, if so, to undertake an Appropriate Assessment (AA) of the implications of the proposals in light of the site's conservation objectives. The AA takes account of the in-combination effects of the proposal on the European/Ramsar sites in association with other relevant projects and plans.

In relation to maintenance dredging and disposal, this Baseline Document has sought to include information on European/Ramsar sites.

2.3 Marine Conservation Zones

The Marine and Coastal Access Act 2009 facilitates the establishment of an ecologically coherent network of Marine Protected Areas (MPAs). The Act established a new type of MPA called a Marine

Conservation Zone (MCZ) to protect nationally important marine wildlife, habitats, geology and geomorphology.

In relation to maintenance dredging and disposal, this Baseline Document has sought to include information on MCZs.

2.4 Water Framework Directive

The Water Framework Directive (WFD) (2000/60/EEC) establishes a framework for the management and protection of Europe's water resources. It is implemented in England and Wales through the WFD (England and Wales) Regulations 2017, known as the Water Framework Regulations².

In relation to maintenance dredging and disposal, this Baseline Document has sought to include information on WFD water bodies.

2.5 Local Harbour Powers

Where powers to dredge in Harbour Areas are conferred by Acts of Parliament, local works or dredge licences issued by the Harbour Authority may permit dredging (and other activities) within the scope of the special Act under which they are issued.

ABP Southampton is the SHA for the study area covered by this Baseline Document, and as such, has powers to carry out maintenance dredging for the safe navigation of vessels under the 'Southampton Harbour Act' 1911. Section 3 'Power to dredge' of this Act states:

"The Board [ABP Southampton] in addition to exercising the powers conferred upon them by the Southampton Harbour Acts 1863 to 1903 may dredge deepen widen and improve the harbour channels and approaches of the port within their jurisdiction to such extent as may in the opinion of the Board [ABP Southampton] be necessary or convenient for the purpose of admitting conveniently ships and vessels of large draught and ships and vessels of such increases draught as may be hereafter constructed and used to the docks quays wharves and other places within the port and may also similarly dredge deepen widen and improve the channel of the Solent at and near Thorn Knoll. Provided that before commencing any of the operations by this section authorised the Board [ABP Southampton] shall apply for and obtain the consent in writing of the Board of Trade [now administered by the MMO] to such operations:

Provided also that all materials excavated or dredged under the provisions of this section if deposited below high-water mark shall be deposited in such position and under such restrictions as may be fixed by the Board of Trade [now administered by the MMO]."

These powers enable ABP Southampton to carry out maintenance dredging in its SHA. Consent is still required from the MMO in the form of a Marine Licence in order to dispose of any maintenance dredge arisings at sea.

It will also be necessary to obtain consent from The Crown Estate in relation to any dredging and disposal activity within their ownership.

² Following the UK leaving the EU, the main provisions of the WFD have been retained in English law through the Floods and Water (Amendment etc.) (EU Exit) Regulations 2019.

3 Coastal Processes and Morphology

3.1 Estuary form

The estuary form is described by environmental conditions, physical layout and morphological features across the estuary system. These properties account for the movement of water, which influences the transport of sediments, and morphological development. In the description of the estuary form, parts of the Central Solent and the lower reaches of the River Test are also considered as part of the estuary due to linkages between the morphology and physical processes that occur. The estuary form is therefore considered in four regions, namely the Central Solent, Southampton Water, Rivers Test and Itchen.

3.1.1 Overview

The environmental conditions, physical processes and morphology features present, vary across the four regions, from the coastal conditions within the Solent through to an estuarine environment in Southampton Water and associated tributaries. The conditions which exist for each of the four regions are summarised below.

Central Solent: The Central Solent within this study is taken to be the region south of Calshot Spit up to the southern margin of the harbour area. The region is more exposed to wave action than the estuary, and further upstream the contemporary morphology is largely explained by the varying wave climate. Tidal processes and flow patterns within this region are also representative of a coastal inlet, with more estuarine conditions developing north of Calshot Spit. This includes the development of tidal saltmarshes (i.e. Lymington Flats) in the lee of the spit. Within the Central Solent, the presence of swash bars on the foreshore of Calshot Spit, also indicates an onshore sediment transport pathway, with the material potential originating from eroded gravel terrace deposits within the Solent or from recirculation of existing shoreline sediments.

Southampton Water: Southampton Water is a relatively narrow and spit-enclosed meso-tidal estuary, subject to very limited wave action and draining a catchment of around 1,630 km² (ABPmer, 2007a). The Joint Nature Conservation Committee (JNCC) classification of Southampton Water, based on the processes that formed the estuary, is a Coastal Plain estuary. It measures approximately 2 km wide at its entrance and 2 km wide at its upper reaches in proximity to Dock Head, with a total length of about 17 km and approximate area of 30 km². Major tributaries into the estuary include the Rivers Test, Itchen and Hamble. The estuary and associated tributaries are primarily governed by tidal processes, which bring about the erosion and deposition of material. The upper reaches of the estuary are relatively sheltered, with influence from waves localised to areas along the coastline that are open to the dominant wave direction.

The present-day morphology highlights the anthropogenic effect of progressive development and reclamation, resulting in the relatively constrained nature of the estuary. Within Southampton Water, the intertidal zone from Highest Astronomical Tide (HAT) to Mean Low Water Springs (MLWS), covers approximately 1,350 ha. Fringing saltmarsh along the estuary covers approximately 190 ha and occurs mainly along the western shoreline, while the eastern shore, particularly in the lower reaches are bordered by mudflats (ABPmer, 2007a). A historical assessment of morphological variation within the estuary indicated that on average, the subtidal area of Southampton Water and the lower reaches of the River Test was widening, with an associated reduction in the hydraulic depth within the estuary (ABPmer, 2012). However, this does not apply uniformly along the whole estuary, with local variations occurring.

River Test: The lower reaches of the tidal river are constrained by existing large developments including the Southampton Container Terminal, Western Docks and the Marchwood Port. The presence of these developments and the associated maintenance dredging that is required means that the morphology along this section of the river is fairly consistent (noting also the recent capital dredge works for the Western Docks Widening project and Solent Gateway Marine project, see Section 3.1.3). Further upstream (i.e. upstream from the bridges at Redbridge), the river has a more natural form with the occurrence of an extensive dendritic marsh system, which extends to the north beyond the scope of this study.

The presence of the marsh indicates an accretionary environment. Monitoring observations would indicate that the marsh system is in a state of dynamic equilibrium within the estuary, as a lateral shift in the extents of the marsh, coincides with an associated increase in the vertical height of these features (ABPmer, 2014). Flow speeds at the lower reaches of the river are similar to those identified at Dock Head. The river is governed by tidal processes, with a small input from local wind waves.

River Itchen: The lower reaches of this river are also heavily modified by waterside developments, as such, the majority of the channel margins are stabilised by hard structures. This is the case for the tidal sections of the River Itchen up to the tidal limit at Woodmill, which also marks the extent of the harbour area. Further upstream of this point the river is non-tidal and has a more natural form. Similar to the River Test, the River Itchen is principally governed by tidal processes that propagate up the estuary, with some influence from waves in the lower reaches and fluvial processes. Due to the orientation of the river, there is a small potential for locally-generated wind waves from Southampton Water to propagate into the river. However, the energy from such waves would quickly dissipate with the changing channel orientations. Due to the confluences of the river with Southampton Water, a small delta is formed with the deposition of material within Southampton Water. This material is removed by regular maintenance dredging.

3.1.2 Geological change

The present morphology of the Solent and Southampton Water is generally considered to have evolved since the period of the last glaciations (Pleistocene) with rising sea levels drowning the former Solent River basin. As water depths increased, waves have also helped develop the shoreline, but with the Isle of Wight acting to shelter the Solent. Rising sea levels during the Holocene also increased the size of Southampton Water, although its shape was determined by the morphology of the Pleistocene terraces bordering the drowned channel (Hodson and West, 1972). These terraces are important in providing a chronology of marine transgressions and fluvial down-cutting that have occurred throughout the evolution of the estuary.

3.1.3 Anthropogenic influence

More recent changes to the estuary and study area have been as a result of anthropogenic factors through reclamation and capital dredging, mainly within Southampton Water and the River Test. A summary of reclamation history within Southampton Water is set out in Table 1, while a summary of historical dredging activities is included in Table 2.

Reclamation in Southampton Water has occurred since 1836 (Eastern Docks, Southampton) and extends up to the 1990s (SCT 1). Between 1928 and 1963, 125 ha were reclaimed at Fawley, most of it in 1950 to extend the refinery site. Land claims tend to constrict tidal flow and locally increased current velocities and sediment transport potential (Gifford and Partners, 1989). Within Southampton Water, land claims have had the effect of narrowing the tidal prism and locally increasing tidal flows (Bray *et al.*, 2004).

Table 1. Reclamation history through Southampton Water

Date	Development
1890-1910	Development of Eastern Docks out over the mudflats at the confluence of the Rivers Test and Itchen.
1920s	Reclamation of some 8 ha for Marchwood Power Station and the Military Port.
1927-34	Reclamation of the Western Docks between Royal Pier and Millbrook Point.
1920s-60s	Dredged Material used to reclaim approximately 80 ha of land around the Exxon Mobil Oil Refinery, the majority of which took place in the early 1960s.
1930s-70	Maintenance dredge spoil used to reclaim Dibden in four stages: Phase 1 – 1930-55; 36 ha; Phase 2 – 1956-60; 40 ha; Phase 3 – 1960-62; 36 ha; Phase 4 – 1962-70; 64 ha.
1950-51	Fawley Power Station reclamation using material from dredging off Calshot approaches to reclaim some 46 ha.
1967-68	Western Dock extension scheme, Phase 1 for Berth 201 reclaimed 6 ha.
1970-72	Phase 2 of Western Dock extension scheme created previous Berths 202-205 (now part of SCT 5 – SCT 3) by reclaiming 32 ha.
1972-75	Phase 3 for previous Berth 206 (now SCT 2) involved reclaiming 45 ha.
1995-96	Previous Berth 207 (now SCT 1) construction completed.

Capital and maintenance dredging of the main channel, dock approaches and berthing areas have periodically been undertaken in the study area for over two centuries. Key details of capital dredge activities are summarised in Table 2. Notable historic capital dredge campaigns in Southampton Water were the removal of 3 million m³ in 1951 to restore and straighten the main access channel (Webber, 1980) and 6.6 million m³ in 1996/7 to deepen the main navigation channel (ABPmer, 2014). In 2014, 11.6 million m³ of material was consented to be dredged as part of the Southampton Approach Channel Dredge project, between the Nab Channel in the approaches to the Eastern Solent and the Southampton Container Terminal. The berth pockets at the Southampton Container Terminal were deepened in 2020/2021: 18,000 m³ was consented to be dredged from SCT1; 30,000 m³ from SCT2; 2,000 m³ from SCT3; and 40,000 m³ from SCT5. In 2023/2024, a capital dredge to remove approximately 900,000 m³ of material to widen the main navigation channel at the Western Docks was carried out, and in 2024/2025 there was the removal of approximately 222,000 m³ at Marchwood Port. More recent capital dredge projects generally result in small adjustments to future maintenance dredging requirements.

Historical chart analysis between 1783 and 2008, by Hopley (2014), suggested that pressures on the estuary, as a result of all reclamation and dredging activities, influenced the dynamic equilibrium, through changes in the balance of sediment budget, energy dispersal and morphology. Reclamation activities were considered to narrow the tidal prism of the estuary, while dredging activities increased the volume and area. These, over time, have had the combined effect of influencing tidal propagation and the sediment budget within the estuary. By adapting to changing conditions, however, the estuary and its reaches would be expected to attain a state of dynamic equilibrium; although, in 2008, Southampton Water and the River Test were still considered to be adapting to past pressures, based on analyses completed in Hopley (2014).

Analysis of monitoring information in relation to dredging activities (both capital and maintenance) however, suggests these have little impact on the overall functioning of the estuary. Instead the dredging activity is thought to maintain a consistent estuary volume at HW and LW (ABPmer, 2007a).

Table 2. Historical capital dredge activities

Date	Development
1882	Channel dredged to 7.4 m below CD in 1889 from Fawley to the docks.
1893	Dredged channel depth increased to 8.6 m below CD.
1907	Dredged channel depth increased to 9.3 m below CD to accommodate new liners. Length of dredged channel extended.
1922-27	Continuous operations to widen and deepen stretches of the channel between Fawley and the Docks and from Calshot out towards Brambles Bank.
1931	Project to widen channel to 305 m and deepen reach below Calshot to 11.1 m below CD. From Calshot to the Docks channel was dredged to 10.2 m below CD.
1951	The largest single dredging contract at the time was awarded to The Dredging and Construction Company Ltd, to remove 2,900,000 m ³ of material by: (i) Straightening the western channel; (ii) Restoring a portion of the Calshot channel to 11.1 m below CD; (iii) Cutting off a portion of the bend around Calshot Spit; and (iv) Restoring a depth of 10.2 m below CD throughout the main channel from Calshot to the Docks, including the middle and lower swinging grounds, and widening the channel to 610 m.
1960s	Deepening in the area of the Solent Channel to 12.6 m below CD.
1973-78	Deepening in vicinity of the Container Port.
1996-97	Approach channel between Fawley and the container terminal deepened from 10.2 m below CD to 12.6 m below CD.
2013	Marchwood Channel widening by 30 m and deepening to 12.6 m.
2012	Berth 201/202 works were consented involving the deepening of the berth pocket at SCT 5 (previously named Berths 201 and 202) from 10.2 m and 12.2 m below CD to 16 m below CD.
2014	Southampton Approach Channel Dredge, in which the main channel was deepened to 13.2 m between Fawley and the Southampton Container Terminal, the Solent Channel was deepened to 13.6 m and the Nab Channel was deepened to 14.4 m.
2020/21	Southampton Container Terminal Berth Improvement Works in which four of the SCT berth pockets were deepened and/or widened to accommodate larger container ships at the berths. The berth pockets at SCT 1 and 2 were deepened to an advertised depth of 15.1 m below CD. Berth SCT 5 was deepened by 0.5 m to 16.5 m below CD. The berth pockets were also widened by up to 15 m to a final berth pocket width of 70 m.
2022/23	Southampton Container Terminal Berth Access Dredge involving a capital dredge adjacent to SCT to enable container ships to safely manoeuvre and berth alongside SCT 1 whilst other ships are moved at SCT 2 to 3. The works involved widening a small section of the navigation channel at SCT and extending the area used by tugs, and a marginal deepening of SCT 2 berth.
2023/24	Western Docks Widening project widened the channel along most of the channel width to allow an increased passing distance between vessels transiting the Western Docks and those vessels alongside, particularly between Berth 106 (Mayflower Cruise Terminal) and Berth 102 (Horizon Cruise Terminal).
2024/25	Solent Gateway Marine project comprised dredging the berth pocket at Falklands Jetty (Berth 3) and the approach channel to Marchwood Port to 11.5 m below CD.

Following the 1996/97 channel deepening, a comprehensive monitoring programme was put in place to identify any changes to the intertidal areas of Southampton Water. This involved surveying along a series of transects between 1996 and 2005 on an annual and, at times, quarterly basis. During the 10 years of monitoring, foreshore levels varied in the order of ± 0.25 m, with no consistent trend, and as a result, the region is considered stable. Observed variations indicated that the eastern shore of Southampton Water underwent some erosion at both the shoreward and seaward ends of the profiles. In contrast, the western foreshore underwent accretion due to the saltmarsh dominance along this frontage. Overall the findings of the decadal monitoring program indicated that the erosion observed along the eastern shore of Southampton Water was more likely the result of natural weather conditions and possibly from other anthropogenic ongoing events and not directly related to the main channel deepening in 1996/97. Furthermore, the erosion identified in the upper part of the profile was considered more likely to be due to wave activity, as a result of weather conditions, than the deepening works (ABPmer, 2012).

What is apparent within the estuary is that the anthropogenic pressures exist. With sufficient time however, the estuary is able to adapt to changing conditions, so as to attain a state of dynamic equilibrium.

3.1.4 Estuary morphology

The contemporary morphology of the Solent shoreline is characterised by barrier spits, intertidal flats, saltmarshes, and erosional coastal cliffs, particularly along the coastline of the Isle of Wight and the Solent approaches (Velegarakis and Collins, 2000). The varied morphology is, to a degree, explained by the varying wave climate along the shoreline. Within East and West Solent, there is a low energy regime, with a limited wave fetch, which is responsible for the relative distribution of saltmarshes and mudflats in this area. Offshore, the seabed morphology is varied and consists of narrow channels, offshore sand and gravel banks, and generally modest water depths, which rarely exceed 20 m. However, there are localised deeps existing in the vicinity of the approaches to the West (e.g. Hurst Narrows) and East Solent.

Bramble Bank is located at the entrance to Southampton Water and is a feature around which the approach channel turns. It is an extensive, depositional bank, which marks the transition between the coarse sediments in the West Solent and the finer sediments in the East Solent. It also acts as a sediment sink for convergent transport pathways from the East Solent, West Solent, Southampton Water and the Medina. Bramble Bank is a relict form inherited from the former Solent River system and is largely immobile under contemporary hydrodynamic conditions. Samples in Bramble Bank demonstrate mixing of minerals originating from river catchments, as well as seabed and shoreface erosion. Importantly, the erosion of the Tertiary coastal cliffs behind Bramble Bank suggests that the protective nature of this feature may not be sufficient to prevent coastal erosion from wind and waves (Velegarakis and Collins, 2000).

Southampton Water is bounded by a spit feature at its entrance (Calshot Spit), which is an area of sediment accumulation, mainly consisting of coarse-grained material (shingle). Calshot Spit is a recurved barrier spit that has remained stable over the last 100 years (Halcrow, 1997). The spit comprises a wide gravel and sand foreshore and would have formed in response to coastal erosion during the early to mid-Holocene sea level rise. There is some question about the origin of these sediments as this material may be eroded gravel terrace deposits originating from channel erosion or may be due to reworking of existing shoreline sediments. The alignment of the spit is indicative of a north-eastward drift (Dyer, 1980) and the present deposits on the foreshore consist of swash bars, which are indicative of onshore sediment transport. In the lee of Calshot Spit, the water is more sheltered, with the development of intertidal flats and saltmarshes (e.g. Lymington Flats).

Sedimentary processes vary significantly throughout Southampton Water (Velegrakis and Collins, 2000). Generally, the sediment transport processes are dominated by tidal currents, especially on the western coast and in the inner estuary, where fine sediments have accreted, although the variable wave climate also influences the morphology and the material that is deposited at the shoreline. For example, the western coast of Southampton Water is almost totally sheltered from wave energy in comparison to the opposing eastern shore, leading to a higher dominance in saltmarsh. The east shore in the lower extents of Southampton Water is bordered by mudflats, which are backed by a series of low cliffs.

The alignments of the Rivers Test and Itchen at their lower reaches are determined by engineered structures, which stabilise the channels. As such any changes in morphology occur as a result of reworking of sediments between the intertidal and subtidal.

Overall, the long period of monitoring within the estuary (inclusive of the Rivers Test and Itchen) indicates that it is in a state of dynamic equilibrium with dredging activities. This is because there is no net change in the estuary volume despite the input of sediment from various sources and the construction of developments, which constrict the estuary margins.

3.1.5 Natural variability

There is evidence to suggest Southampton Water, plus the Rivers Test and Itchen are locally dynamic in their intertidal and subtidal morphology. The whole estuary is therefore most likely in a state of dynamic equilibrium, as the processes which occur locally are interconnected as further suggested by work completed by Hopley (2014). The dominant natural influences on morphological change within the estuary are tides, waves, freshwater flows, tidal surges and biological activity (with additional contributions from anthropogenic factors considered in Section 3.1.3). These influences in turn produce changes in suspended sediment concentrations (SSC), deposition rates, bed composition and channel configuration.

An assessment of the potential natural variability of conditions within Southampton Water and the River Test was completed for the Estuary Guide (ABPmer, 2007a) and reviewed for recent studies (including the previous MDP (ABPmer, 2016) and the Solent Gateway (ABPmer, 2024a) and Western Docks Widening (ABPmer, 2024b) projects). These analyses included estimations of the intertidal and subtidal estuary volumes.

The results indicated that in Southampton Water the lower channel side-slopes are eroding but at a slower horizontal rate than the upper section. Whereas, in the River Test, the lower channel side slopes are accreting, whilst the upper section is eroding, resulting in the net reduction in subtidal volume. When considering the subtidal changes at high water (HW), some areas of mudflat are getting larger even though they are eroding at low water (LW). The estimates derived for Southampton Water and River Test, indicate almost no net change in the foreshore area, suggesting that overall the intertidal is migrating landwards as the saltmarshes and cliffs erode. This, therefore, suggests that, under natural conditions, the mudflat in Southampton Water is (on average) eroding vertically and translating landwards, with a consequent loss of saltmarsh, but limited loss of mudflat area. The described landward shift could most likely be in relation to tidal propagation properties as a result of changes within the estuary as discussed in Section 3.1.3, with respect to anthropogenic influence. Southampton Water and its reaches are regarded as highly modified bodies of water under the WFD (Section 7.4), a characteristic which, in turn, is likely to influence the natural processes that occur within the estuary. With no further intervention or modification of the estuary and its reaches, the most likely scenario is the infilling of the channel in order to attain an established equilibrium.

3.2 Hydrodynamic regime

3.2.1 Overview

Tides are the primary influence on water movements and control the advection of suspended sediments. Waves tend to have their main influence at the shoreline and help to develop features such as the various shingle spits evident across the Solent. The more sheltered area within Southampton Water and River Test is conducive to the development of saltmarsh, especially along the western estuary margin, which is in the lee of prevailing winds. A description of the hydrodynamic regime and additional inputs from fluvial sources is summarised in more detail in the sections below.

3.2.2 Waves

The presence of swell waves in the West Solent and Southampton Water is minimal due to the protection gained from the Isle of Wight, Calshot Spit and the Bramble Bank. The West Solent provides an open fetch for the limited generation of local waves from the predominant south-westerly wind direction. The resulting waves have the greatest impact on the coastline near Lee-on-Solent, leading to coastal erosion along this coastline. The maximum significant wave height during the peak autumn and winter months is on the order of 1.2 m (Webber, 1980).

The wave regime within Southampton Water is more sheltered, with the dissipation of swell waves at lower sections and the occurrence of locally-generated wind-waves at the upper sections of the estuary. Along the estuary, the eastern shore generally experiences greater wave energy dissipation as it faces the prevailing wind direction. The western shore is then more sheltered as it is in the lee of the prevailing winds (ABP Research, 2000a). There is generally a reduction in wave energy towards the upper extents of Southampton Water, in proximity to Dock Head and into the rivers. Evidence for the low wave regime within the estuary is the occurrence and ongoing development of saltmarsh and mudflat systems along Southampton Water and in the River Test. Studies within the estuary have shown there is significant inter-annual variability in the wind-wave climate as a result of changes in the prevailing wind conditions. Discrete periods of wind data for 1984 to 1991 and 1988 to 1997 demonstrate an increase in wind generated wave energy of 17% between the two intervals, which was attributed to the increasing prevalence of easterly winds. Within Southampton Water, vessel disturbance also provides an additional, but limited source of wave energy at the shoreline.

3.2.3 Tidal levels

The primary influence on water levels within the estuary is due to tides, although strong winds (especially north-easterlies), surges and variations in atmospheric pressure can have secondary effects leading to occasional increases or decreases on the tidal effect. The tidal regime is semi-diurnal and shows a marked increase in range as the tide advances from west to east, with an increasing spring tidal range from 2 m at Hurst Point to 3.9 m at Portsmouth.

The local phasing of tidal constituents within the English Channel creates a double HW, which progresses further into the Solent. This in turn results in an extended HW for Southampton Water, which lasts for up to 3 hours. Also, within Southampton Water on spring tides, an added feature of the tide develops during the flood phase, around two hours after LW. The phenomenon known as the "Young Flood Stand" occurs and is mainly evident as a pause in the rising tide. The profile of the tide is clearly asymmetric with the flood phase (lasting around 9 hours to the second HW) lasting longer than the ebb phase (lasting around 3.5 hours).

Tides are currently monitored at a number of locations in Southampton Water, the River Test and Central Solent:

- Calshot Jetty at the entrance to Southampton Water;
- Ocean Dock;
- Dock Head (Berth 37), the Standard Port;
- Town Quay;
- Upper Swinging Ground at Marchwood/ Southampton Container Port; and
- Bramble Pile in the Central Solent.

There is general consistency in the pattern of the tide both in phase and amplitude, with only a moderate increase in range moving upstream. On average within Southampton Water, the mean tidal ranges are 4 m and 1.9 m for the spring and neap tides respectively, and an astronomic range of 5.1 m. The majority of tides fall in the range 2 to 4 m equivalent to a meso-tidal range (Figure 8).

Table 3 presents tidal levels for Southampton Water, referenced to Dock Head (Berth 37) which provides a level that is considered indicative for the estuary.

Table 3. Tidal levels for Southampton Water

Tidal Level	Tidal Level Chart Datum (m above/below CD)
Highest Astronomical Tide	5.0
Mean High Water Spring	4.5
Mean High Water Neap	3.7
Mean Tide Level	2.6
Mean Low Water Neap	1.8
Mean Low Water Spring	0.5
Lowest Astronomical Tide	-0.1
The tidal levels relate to observations at Dock Head (Berth 37), which are considered indicative for the estuary system.	

Another important variation in the tidal range is due to the lunar nodal cycle, which operates over a period of 18.61 years. Long-term data from Portsmouth (ABPmer, 2007a) indicates that this effect alone causes variations in tidal range of the order of 0.25 m. The trough of this cycle last occurred in 2006/2007 and, therefore, the overall tidal range has increased slightly towards the lunar nodal peak in 2024/2025. Subsequently, this cyclic trend will now start to slightly reduce the tidal range (year-on-year) for the next 18.6-year period (until 2042/2043).

Historic analysis of long-term tidal records from Portsmouth demonstrated a trend in mean sea level rise for the general area of 1.7 mm/year (ABP Research, 2001). Increased rates of mean sea level rise are now predicted in response to climate change concerns. Environment Agency guidance (Environment Agency, 2016) provides revised allowances for South East England of 5.7 mm per year to 2035, increasing to 8.7 mm per year for the period 2036 to 2065. In addition, the present guidance from the UK Climate Projections (UKCP18) RCP8.5 scenario, predicts a rise, from current levels within the estuary, of 0.24 m by 2050 and of 0.99 m by 2100 (based on the 95th percentile likelihood).

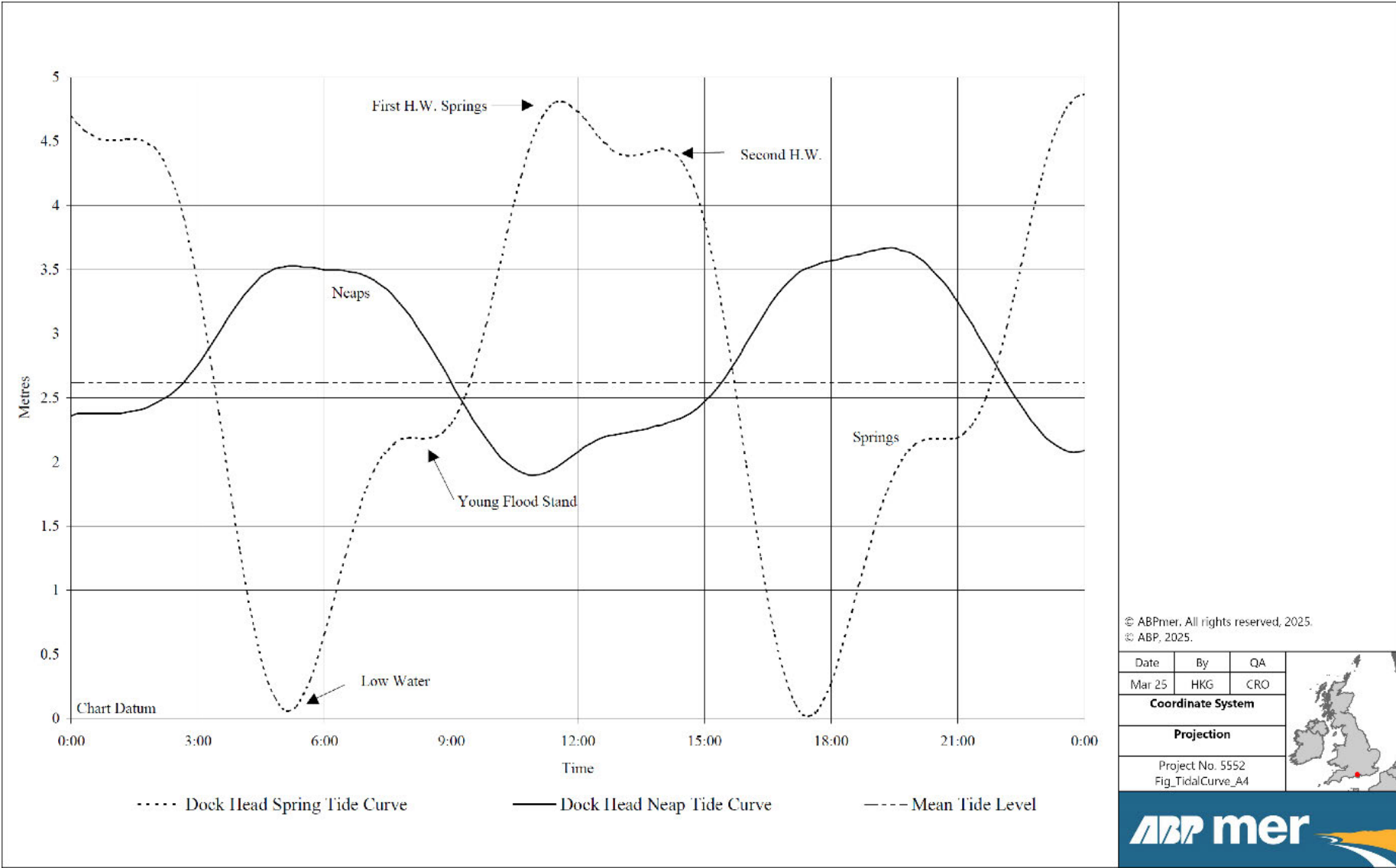


Figure 8. Spring and Neap Tidal Curve for Southampton Water

3.2.4 Tidal currents

The primary influence on flows through the Solent and Southampton Water is moderated by changing tide levels. The alignment of the flows is then determined by the shoreline, channels and banks. Winds, surges and freshwater inflows have also been shown to introduce local and secondary influences on flows within the estuary.

Given the atypical shape of the tidal curve (Figure 8), the resulting flows within Southampton Water are complex and give rise to important mechanisms, which are conducive to move fine sediments onto intertidal areas. The asymmetry of the tide, with a longer duration on the flood phase than ebb, creates stronger flows on the ebb. This ebb dominance can be illustrated by tidal streams at Calshot, where, on a spring tide, ebb flows reach 1.0 m/s, whereas on a flood tide flows reach 0.7 m/s (ABP Research, 2000a). A further unique feature occurs during the flood phase of the tide, which is evident on spring tides. The Young Flood Stand creates an initial slack water period, which is then followed by a further slack water period over the extended (double) HW.

3.2.5 Freshwater inputs

Freshwater inputs to the estuary also contribute to the flow regime and lead to variations in salinity. Primary sources of freshwater are from the Rivers Test, Itchen and Hamble. Rates of freshwater input are highly variable and correlate to the scale of each river catchment and patterns of rainfall, which vary seasonally, with largest flow rates expected during the winter period. Statistically, the River Test provides the largest average winter freshwater source to the system, with flows at 16 m³/s compared to the Itchen at 7 m³/s and Hamble at 0.5 m³/s (National River Flow Archive). This is based on the 50th percentile exceedance value for the period during December to March. A further smaller tributary that drains into Southampton Water is Tanners Brook, which has an average winter discharge of 0.2 m³/s.

The relative contribution of freshwater input remains small when compared to the volume of water exchanged during each tide (i.e. the tidal prism; defined as the difference in water volume between LW and HW). For example, the total river flow rate based on average winter conditions is 23.7 m³/s. Over a 9-hour flood phase this provides a volume of less than 0.1 million m³ of freshwater input. The equivalent tidal prism for neap tides is 54 million m³ and 109 million m³ on spring tides.

The freshwater inputs from the main tributaries influence the magnitudes of salinity throughout Southampton Water with concentrations generally ranging from near fully marine conditions at Calshot (measured in the range of 30 to 33.5 ppt) to more estuarine levels at Town Quay. The potential does exist for localised and short-term stratification, which may occur in the upper reaches of the River Test during periods of high freshwater discharges combined with neap tides (although the estuary is generally considered to be well-mixed overall).

3.3 Sediment transport pathways and budget

3.3.1 Overview

Present day sedimentary processes vary significantly within the differing estuarine sedimentary environments throughout Southampton Water (Velegarakis and Collins, 2000). Sediment transport processes are dominated by tidal currents, especially on the western coast and in the inner estuary where fine sediments have accreted. The morphology of the estuary boundaries is reflected in the dominance of the tidal processes, and the variable wave climates. The west shore is almost totally sheltered from wave energy in comparison to the opposing east shore, leading to a higher dominance

in saltmarsh. The east shore is then bordered by mudflats, which are backed by a series of low cliffs. As a result of the varying forcing controls, the sediment regime varies along the estuary.

3.3.2 Sediments

The sediment characteristics of the Solent, the local river channels and estuaries comprise Pleistocene gravels, which are covered by layers of Holocene sands, and gravels. The seabed at the southeastern extent of the harbour area is characterised by buried channel infilling sediments and surficial sediments, where the buried channel deposits are predominantly coarse-grained. The seabed in the West Solent at the southwestern extent is predominantly covered by gravel and sandy gravel, with mixed and varying proportions of sand-sized material.

The seabed in Southampton Water consists of geological strata that have been recently exposed by dredging in the main navigation channel. Within the estuary, the sediment varies from sandy clay near the Upper Swinging Ground to sands and gravels at Fawley. On either side of the navigation channel, clay sediments are found overlying a layer of gravel. Along the western shore, mud deposits are the predominant surface sediment.

Between Calshot and Fawley, the main navigation channel is floored by Pleistocene gravels and thin Holocene deposits of silts and clays. The gravels comprise sub-angular flint and brown sandy clay forming stable slopes. At Calshot, the silts are around 13 m thick on the side slopes and intertidal areas. At the northern end of the Fawley Terminal the navigation channel consists of southward-dipping glacial gravel overlain by Holocene silty clay and above that a shallow band of Solent Marine Shingle.

Further upstream from Fawley, the buried Pleistocene palaeo-channel lies closer to the surface and the navigation channel cuts through Pleistocene gravel into the laminated silts, clays and the fine to coarse sands of the Bracklesham Beds. The side slopes of the navigation channel and the intertidal areas in the upper reaches of Southampton Water comprise clays and silts with a maximum thickness of 6 m, which are underlain by gravels up to 5 m thick.

3.3.3 Sources

Sediment sources across the study area are listed below and their main properties summarised in the following sections. In general, these sources vary significantly in the amount of material they contribute into the estuary system, with the largest input coming from material held within the subtidal and intertidal areas of the estuary.

- Marine input;
- Fluvial input;
- Intertidal erosion;
- Subtidal erosion;
- Cliff erosion; and
- Saltmarsh erosion.

Marine inputs

The primary input of suspended sediments to Southampton Water is from marine sources with the process of advection-diffusion drawing in the sediments from the Solent. River sediment loads are secondary and fluctuate with discharge events to create local variations at the head of the tributaries. Average measured SSC in Southampton Water vary from around 25 to 40 mg/l at the mouth (peak springs about 60 mg/l), 10 to 20 mg/l at Dock Head and 5 to 10 mg/l in the vicinity of the Southampton Container Terminal in the River Test (ABPmer, 2014).

Fluvial inputs

An estimate of the annual sediment inputs from the Rivers Test, Itchen and Hamble equates to 10,000, 6,000 and 1,000 m³ per year, respectively (Bray, 2000). This estimate includes some bedload material that could be stored in the lower river channel reaches and also fine sediments on flood plains, both of which may not be supplied directly to Southampton Water.

Intertidal erosion

The rate of intertidal erosion, as assessed from monitoring and historical data, is set out in Table 4. The results indicate that the erosion of the intertidal area, leading to the landward movement of the HW mark, is greatest in Southampton Water, with no significant change within the River Itchen. This trend remains evident in the recent (November 2023 and April 2024) drone monitoring surveys undertaken by ABPmer on behalf of ABP Southampton towards the northern extent of the estuary, between Hythe and Eling in the lower part of the tidal River Test. The survey campaign is still underway, but initial assessment results indicate some movement of intertidal channels (with erosion on one bank and accretion on the other), along with a general retreat of the HW mark along the intertidal margins.

Table 4. Estimated intertidal erosion volume within Southampton Water and the Rivers Test, Itchen and Hamble

Location	Estimated Erosion Rate (x10 ³ m ³ per year)
Southampton Water	53
Test	23
Itchen	-
Hamble	3

Subtidal erosion

Since 1996, monitoring of the estuary has indicated that there has been a marginal reduction in the amount of subtidal erosion. Recent capital dredge campaigns have been subtidal and, consequently, have not directly increased the tidal prism of the estuary (Section 3.1.3). The general flow rates have decreased and these reduced flows, along with greater depths, have reduced bed shear stresses within the main channel. This, linked with the exposure of denser materials at the base of the channel, has reduced the potential for channel erosion. In the shallow subtidal areas, flow speed reductions will have been proportionally less (compared to within the dredged main channel), but the areas remain exposed to erosive forces from waves. These erosive forces in the shallow subtidal areas are not likely to have changed. Table 5 sets out the present day estimated subtidal erosion rate. Spatially, the pattern seems to be erosion of the lower channel slopes but at a slower horizontal rate than the upper channel.

Table 5. Estimated subtidal erosion volume within Southampton Water and the Rivers Test, Itchen and Hamble

Location	Estimated Erosion Rate (x10 ³ m ³ per year)
Southampton Water	29
Test	0
Itchen	2
Hamble	2

Cliff erosion

Cliffs occur only along a small section of the estuary, between the Rivers Itchen and Hamble, at Netley. These cliffs are shallow and generally do not exceed 8 m in height and consist of sandy gravel and medium to coarse gravel sediments (Halcrow, 1997). Different sources have provided varying estimates of the annual erosion rate of these cliffs, which range within 0.1 m to 0.5 m per year (Halcrow, 1997; Posford Duvivier, 1994; 1996; 1997). It was also estimated that the annual erosion of these cliffs contributes up to 50 to 100 m³ of sand and gravel per year to the local beaches. A further 400 m³ per year of finer material is probably removed as suspended load (Posford Duvivier, 1997). Although the amount of sand and gravel supplied from the cliffs is relatively low, it appears to supply an adequate amount of sediment to the adjacent beaches (Hydraulics Research, 1987).

Historically, the cliff was eroding at a greater rate along this frontage due to natural processes. However, some parts of the cliff were partially protected through the piecemeal construction of defences (with varying quality and effectiveness) along the frontage. The rate of erosion is also influenced by slope destabilisation arising from the disturbance of vegetation which is caused by a combination of basal erosion and shallow slides (Bray *et al.*, 2004); weathering also probably makes an additional contribution.

Saltmarsh erosion

Saltmarsh erosion is primarily related to the retreat of the fronting edge of the feature. Changes to saltmarsh in Southampton Water were estimated using aerial photography (collected between 1946 and 1996) at approximately 10-yearly intervals (ABP Research, 2000b). Due to land reclamation in the area, the changes in saltmarsh coverage are confined to the area seaward of the present-day defences and walls in Southampton Water. The analysis identified that the area of saltmarsh decreased during this period at an approximate rate of 0.6 ha per year (Table 6). Using this value and a mean saltmarsh depth of 1 m, the sediment yield from saltmarsh erosion was estimated at 6,000 m³ per year. Further inputs into Southampton Water occur as a result of saltmarsh erosion within the River Hamble, where it was estimated that approximately 6,000 m³ of material is input into the estuary (CCO, 2007).

Table 6. Changes in saltmarsh areas within Southampton Water (1946 to 1996)

Year	Fawley and Calshot (ha)	Hythe to Cadland Creek (ha)	Eling and Bury (ha)	Whole Estuary (ha)
1946	304	101	44	449
1954	239	92	41	372
1963	202	84	40	326
1976	134	83	25	242
1986	98	79	20	197
1996	98	75	18	191

Source: ABP Research, 2000b

3.3.4 Sinks

Sediment sinks are defined as areas where siltation occurs and leads to net deposition. Siltation rates in Southampton Water tend to be low and are attributed to limited SSC, natural sediment scour and transport by ebb currents, but are enhanced in quieter areas outside of the main flows. Redistribution of sediments can occur in relation to vessel movements and dredging activity.

Sediment sinks within the study area occur within commercial berths, approaches and marinas, and in areas of accreting saltmarshes and intertidal areas. The highest observed sedimentation is predominately in the SCT berths, around the berths of Dock Head and at Hythe and Ocean Village marinas. The siltation within Southampton Water tends to be more rapid to the west of the main

channel. To the east, siltation rates are lower and have been measured at 0.02 to 0.04 m per year (Flood, 1981).

In terms of saltmarsh accretion, positioning measurements using Differential Global Positioning System (DGPS) by ABPmer (2007b) between 1996 and 2005 indicate that although the fronting edge of the saltmarshes are eroding, the elevation of the saltmarshes has remained stable with respect to sea level rise, with no evidence of vertical erosion. An approximate accretion rate of 4,000 m³ per year was calculated for the saltmarshes within the estuary. With respect to intertidal accretion, available evidence suggested that this only occurs within the River Itchen at an approximate rate of 2,000 m³ per year (ABPmer, 2012).

3.3.5 Transport pathways

Sediment transport pathways within Southampton Water differ for coarse- and fine-grained sediments. The asymmetric form of the tide provides stronger flows during the ebb phase, which leads to a potential net seaward transport of coarse sediments. This process will lead to natural sorting of sediments along the channel with sands eventually being lost from the estuary and a long-term trend to an overall fining of sediments within the estuary and upriver. Bramble Bank is a potential sink for the exported coarse sediment. Fine sediments are carried in suspension with the tide. During the flood phase, the fine material brought into the estuary from the Solent has extended periods to settle out before the ebb phase, especially around the HW period. A brief flow reversal also develops during the Young Flood Stand with a pattern of return flows evident across the intertidal area of Hythe Marshes, the shore between the Rivers Itchen and Hamble, on the Dibden foreshore and an area of low flow (null zone) between the main channel flow. When the flood tide resumes, the recirculation ceases and flow directions in the intertidal zone return to an upstream direction. Ebb dominance in flow reduces in an upstream direction making areas upstream more susceptible to siltation, as evidenced by the greater dredging requirements upstream of Dock Head.

3.3.6 Sediment budget

The total sediment budget for the estuary was estimated based on past evidence and understanding related to the post-1996/97 channel deepening situation (ABPmer, 2012). The results are summarised in Table 7.

Table 7. Summary of baseline sources and sinks for Southampton Water (x10³ m³ per year)

Sources of Sediment			Sinks and Removal of Sediment		
Intertidal erosion	Southampton Water	53	Intertidal siltation	Southampton Water	-
	Test	23		Test	-
	Itchen	-		Itchen	2
	Hamble	3		Hamble	-
Subtidal erosion	Southampton Water	29	Subtidal siltation	Southampton Water	-
	Test	0		Test	-
	Itchen	2		Itchen	-
	Hamble	2		Hamble	-
Cliff erosion	Southampton Water	5	Dredging	Southampton Water	201
River load	Test	10		Test	224
	Itchen	6		Itchen	7
	Hamble	1		Hamble	13
Saltmarsh		8	Saltmarsh		4
Marine import		309			
Total		451	Total		451

In general, the estimates indicate there is an approximate balance with the estuary, whereby the inputs equate to the outputs as a result of sinks and anthropogenic activity. Assessments of impacts on the estuary sediment budget have also been undertaken for the recent dredging projects, namely the Western Docks Widening Project and Solent Gateway Marine Project (ABPmer, 2024a; b), which found the effects to be negligible.

4 Dredging Information

ABP Southampton as the SHA has a statutory duty to maintain advertised depths of water in navigable channels within its jurisdiction, in addition to its operational berthing facilities. This is achieved through regular, carefully planned maintenance dredge campaigns. Capital dredging is undertaken by ABP Southampton, which is subject to a separate consent, whenever there is an operating and/or commercial need to deepen and/or widen existing berths, approaches or channels (e.g. to accommodate larger ships).

In addition to dredging by ABP Southampton, there are around 12 other organisations which carry out, or have carried out maintenance dredging within the last 10 years within the study area. Where available, information on third party dredge operators and activities including their locations, methods, volumes and times has also been obtained.

Four main sediment types are removed from the estuary by dredging and include:

- Thin veneers of recently deposited clays and silts: These are layers of fine sediment that have recently been deposited, including re-settled sediments distributed by previous dredging operations. This sediment type forms the majority of the volume of maintenance dredged material;
- Mid to Late Holocene clays and silts: These sediments also consist of clays and silts but were deposited over the past 5,000 to 6,000 years. This sediment type is only generally removed through capital dredging activities;
- Pleistocene gravels: These gravels are deposited as river terraces during the Devensian establishment of the 'Solent River' system. This sediment type is generally only removed through capital dredging activities; and
- Tertiary (Eocene) sands, silts and clays: These sediments form the underlying substrate and date back to the Eocene epoch within the Tertiary period. This sediment type is only generally removed through capital dredging activities.

The following sections describe the current known maintenance dredge activities, outlining dredge quantities, dredge techniques and identifying open, closed and disused dredge disposal sites. Capital dredge works that have been undertaken in the estuary are described in Section 3.1.3.

4.1 Current dredge practice

4.1.1 Overview

Maintenance dredging of the main navigation channel and ABP Southampton managed berths and approaches are undertaken roughly every six months, with a spring and an autumn campaign. In addition, maintenance dredging also occurs at a number of other facilities within the SHA by non-ABP (third party) operators. These include the Marchwood Port (which will be maintenance dredged by ABP Southampton in future following the acquisition of Solent Gateway Ltd by ABP in 2023), Fawley Marine Terminal, the BP Jetty, Esso Oil Refinery, Intake Channel to Fawley Power Station (Fawley Waterside Ltd), marina and wharves in the Rivers Test and Itchen, and along Southampton Water. The predominant sediment type removed by maintenance dredging comprises recently deposited clays and silts, including re-settled sediments distributed by ship movements and previous dredging operations.

ABP Southampton maintenance dredging practice involves regular bathymetric surveys to determine the amount of material above a nominal maintained depth. This material is subsequently dredged and

removed to the Nab Tower Deposit Ground (WI060, Figure 9). Further survey work is then carried out to assess the interim changes and if bed levelling is required with a plough. The plough shifts small amounts of material above a nominal maintenance level into nearby deeper parts mainly to smooth out drag head furrows and maximise water depth achieved. Monitoring data of dredge volumes has been collected biannually since 1996/7 for all ABP maintained berths and channel areas. A summary of the average maintenance dredge volumes within the study area between 2015 and 2024 is set out in Table 8, with an average maintenance dredge volume of 314,520 m³ per year.

In addition to the volumes shown in Table 8, approximately 98,000 m³ per year is dredged by third parties from the Exxon Mobil berths, Fawley Waterside, Princess Wharf, the BP Jetty and Marchwood Port.

Table 8. Maintenance dredging volumes within the study area between 2015 and 2024

Average Between 2015 and 2024	Dredge Areas Above Dock Head Including Rivers Test and Itchen (x10 ³ m ³ /year)	Dredge Areas Downstream of Dock Head (x10 ³ m ³ / year)	All Dredge Areas (x10 ³ m ³ / year)
Average per year	124	33	314
Maximum	288	100	288
Minimum	17	0	0
Range	270	100	288
Standard deviation	82	33	77

4.1.2 Beneficial use

Waste policy and, consequently, the preparation of waste hierarchy assessments, is strongly governed by the waste hierarchy set out in Article 4 of the Waste Framework Directive (2008/98/EC). This Directive is transposed in England and Wales through the Waste (England and Wales) Regulations 2011³. The waste hierarchy ranks waste management options according to what is best for the environment and comprises the following, in order of most to least favoured (top to bottom):

- Prevention;
- Re-use;
- Recycle;
- Other recovery; and
- Disposal.

The waste hierarchy places emphasis on waste prevention or minimisation of waste, followed where possible by re-use of the material.

For any dredging project, the *in situ* characteristics of the material (physical and chemical), as well as the method and frequency of dredging (and any subsequent processing), determines its characteristics for consideration through the waste hierarchy. This understanding is central for consideration of management options for dealing with dredged material with respect to the waste hierarchy. Marine licencing guidance states that an applicant must take account of the waste hierarchy and consider alternative means of dredge and disposal before applying for a Marine Licence.

³ Following the departure of the UK from the EU, the main provisions of the Waste Framework Directive have been retained in English law through the Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020.

There is a general acknowledgement that, where practicable, the beneficial use of dredge material is a positive option. This provides a more sustainable approach to sediment management compared to disposal at sea or, the least desirable option, sending dredged material to landfill. Beneficial use can involve a wide range of activities, projects and stakeholders whereby a source of material (i.e. generated via dredging activities) and a use are connected to provide mutual environmental benefits.

The main approach to avoiding the generation of waste would be to not undertake the proposed works. However, the maintenance dredging is essential to maintain the charted and operational seabed depths which are safe for vessel navigation.

ABP Southampton has ongoing and regular discussions with relevant stakeholders (including Natural England, the Environment Agency and the MMO) and regional groups (e.g. Solent Forum) concerning the beneficial re-use of the dredge material and no immediate opportunities have been identified. This is a requirement under Condition 5.2.14 of ABP Southampton's existing Marine Licence (L/2015/00330/1) for the disposal of maintenance dredge arisings.

A review of the options for longer-term beneficial use of sediment was undertaken in 2024 to discharge Condition 5.2.3 of Marine Licence (L/2023/00356/1) for the Western Dock Widening project (ABPmer, 2024b). This work has highlighted how delivering beneficial use is subject to several environmental, practical and regulatory challenges. This means that beneficial use projects are infrequent and often small in scale (using only a few thousand cubic metres at a time). These long-established issues still apply today although many parties have been working to change the situation and some progress has been made and new approaches adopted in recent years. However, projects are still typically small scale and can be complex and costly to implement.

The nearest licensed beneficial use deposit ground (Lymington Habitat Restoration, WI085). There are, however, practical, environment and financial issues that will influence if dredged sediment can be provided. The main considerations include whether the sediment from maintenance dredging is suitable for placement and that is affected especially by the methods of dredging and the size of the barge transporting the arisings. The use of a trailing suction hopper dredger (TSHD) is not suitable for placement at the beneficial use site at Lymington as the sediment is fluid in the hold. There are also particular challenges for large dredgers accessing inshore areas where the sediment would be most beneficial for recharging saltmarsh habitat.

In summary, it is considered that no viable options for beneficial reuse currently exist for the material that is maintenance dredged by ABP Southampton. Without any suitable uses available at the present time, disposal in the marine environment at a licensed disposal site is considered the Best Practical Environmental Option (BPEO).

4.1.3 Dredging methods

Trailer suction hopper dredging

TSHD uses suction to raise loosened material from the bed through a pipe connected to a centrifugal pump. Suction alone is normally sufficient for naturally loose material, such as recently deposited material within deepened areas such as the approach channel or berthing areas. TSHD is most efficient when working with fine substrates such as mud, silt, sand and loose gravel as the material can be easily held in suspension. Coarser materials can also be dredged using this method, but with a greater demand on pump power and with greater wear on pumps and pipes. Material dredged by TSHD then requires depositing either within a licensed sea or land disposal site usually by direct bottom dumping (at sea)

or through pumped discharge (to a land disposal or beneficial use site). This is the most common method of maintenance dredging used in Southampton Water.

Backhoe Dredging

Backhoe dredging involves a vessel which has one or more dredging cranes mounted around a receiving hopper or barge. The cranes are fitted with grabs that pick up material from the seabed, and discharge the material into the hopper or barge. The backhoe dredger is usually held in position while working, by anchors and moorings. However, a few are fitted with spuds, or piles, which can be dropped onto the seabed whilst the dredger is operating. Once loaded, the vessel or barge moves to a disposal site to discharge material, which is normally achieved through direct placement at the site by direct bottom dumping.

Water Injection Dredging (WID)

WID consists of injecting large amounts of water at low pressure into surface sediments on the seabed. This generates a high density layer on the seabed, normally being a maximum of 1.0 m deep, with the highest density part of the cloud being 0.5 m above the bed. The density cloud acts as a fluid layer and flows over the bed through the action of gravity along the seabed contours. The aim of this form of dredging is not to suspend sediments within the water column, but rather to move sediments from one area to another, and thus keep the sediment within the system. Some re-suspension of fine sediment fractions often occurs locally to the WID site, or where tidal flows are higher thereby mobilising material. If the density cloud flows over a pronounced change in bed gradient, material also has the potential to be re-suspended.

Plough Dredging (Bed Levelling)

Plough dredging utilises a tug equipped with a plough unit. The plough is lowered to a predetermined depth and is used to drag sediment along the seabed. Ploughing is typically used in confined areas due to the small size and manoeuvrability of the vessel, moving material from inaccessible areas such as dock entrances, corners or complicated areas of bathymetry to areas accessible by TSHD or WID vessels, or is used for bed-levelling purposes only. Ploughing is often used in combination with TSHD operation to smooth out/fill in drag head furrows to achieve a more even bed level. Any material above the nominal maintained level (high spots) could pose a danger to the safety of navigation.

4.2 Maintenance dredge disposal

Within and in proximity to the SHA, there are a number of disposal sites which were or are still available for the licensed disposal of maintenance and capital dredge material. Table 9 lists the nearby sites along with their current status, i.e. open, closed or disused. The locations of these disposal sites are shown on Figure 9.

Table 9. Disposal sites nearby to the study area

Disposal Site Number	Disposal Site Name	Status
WI060	Nab Tower	Open
WI075	Southampton Docks Town Quay	Closed
WI080	Hurst Fort	Open
WI085	Lymington Habitat Restoration	Closed
WI090	Needles	Open
WI091	West Wight	Closed

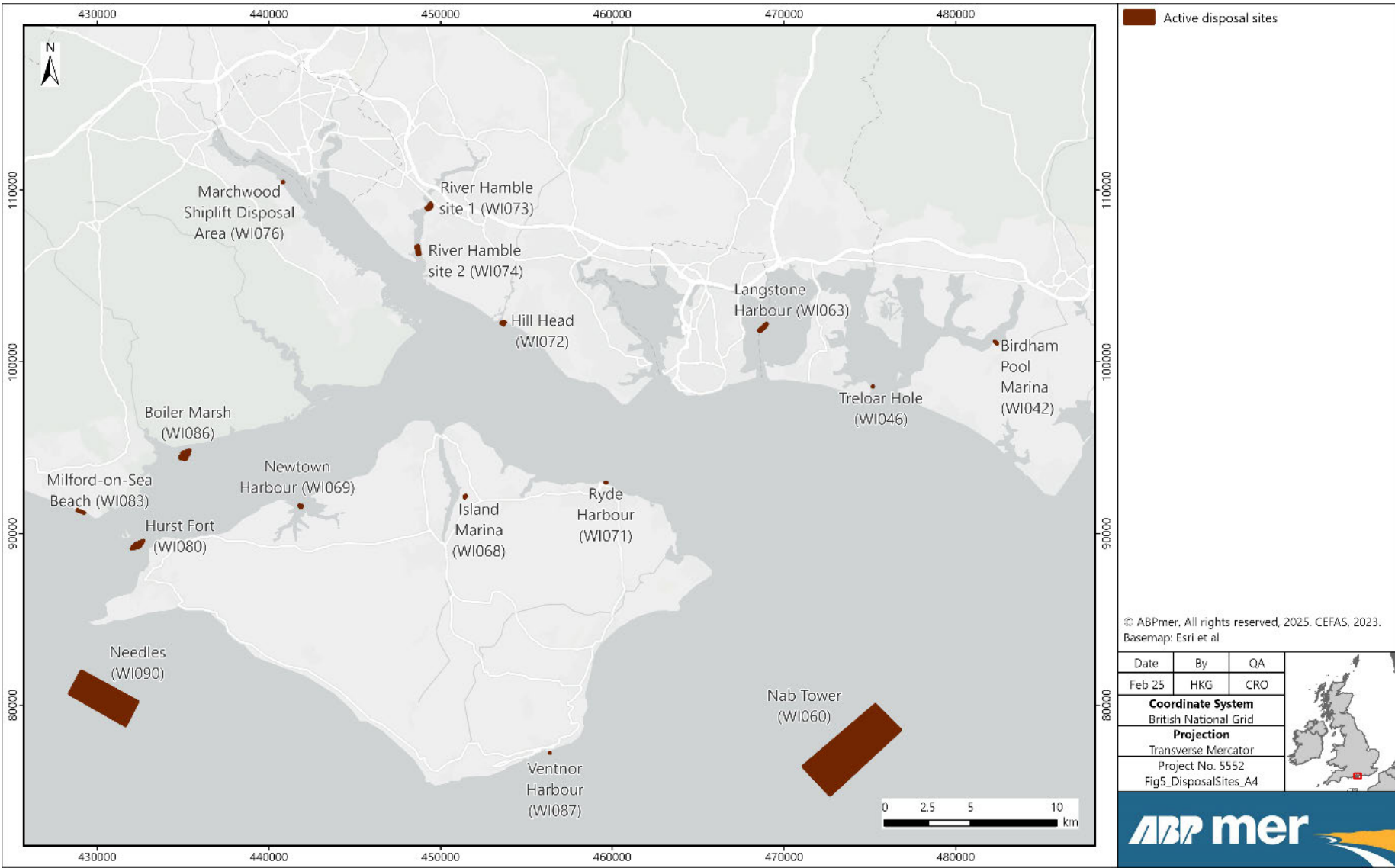


Figure 9. Disposal sites in the study area

Only the Nab Tower (WI060) is currently used for the disposal of maintenance dredge arisings by ABP Southampton. The Nab Tower (WI060) disposal site is located in the Eastern Approaches to the Solent in approximately 40 m water depth, 12 km off the southwest coast of the Isle of Wight (Figure 9). This deposit site receives both capital and maintenance dredged material from nearby harbour areas including Southampton, Portsmouth, Chichester and Cowes.

Third party organisations within the SHA principally use the Nab Tower (WI060), along with Hurst Fort (WI080) and the Needles (WI090). In all cases, a Marine Licence is required for the disposal of material at these sites.

The Disposal at Sea (DAS) records for the Nab Tower (WI060), Hurst Fort (WI080) and the Needles (WI090), for the period between 2013 and 2023 were obtained from Cefas and are included in (Table 10). It should be noted that this data includes disposal volumes from all dredge activities within the wider study area (i.e., not only ABP Southampton). The dredge volumes within this table also include both capital and maintenance dredge disposal volumes, as standalone maintenance dredge disposal data was not available from Cefas at the time of writing (March 2025).

For the Nab Tower (WI060) disposal site, the peak amount disposed at this site occurred in 2014. Large disposal volumes in 2014 are linked to the Southampton Approach Channel Dredge project. During this time, approximately 4.9 million tonnes of material was disposed, while the annual average amount of material disposed at the site since 2013 was 1.3 million tonnes. For the Hurst Fort (WI080), the peak amount disposed was 124,321 tonnes in 2019, with an annual average of 33,913 tonnes. At the Needles (WI090) disposal site, the peak amount disposed was 6,010 tonnes in 2021, with an annual average of 1,920 tonnes.

Table 10. DAS wet tonnage records for maintenance and capital dredging returns at relevant disposal sites

Site Code	2013	2014	2015	2016	2017	2018	2019
WI060	533,426	4,875,890	702,340	869,587	2,045,562	1,553,794	866,219
WI080	19,370	26,981	35,815	30,939	30,893	25,118	124,321
WI090	1,653	600	364	0	0	0	0
Site Code	2020	2021	2022	2023			
WI060	995,784	1,590,468	829,147	757,722			
WI080	18,835	13,220	26,325	21,229			
WI090	0	6,010	0	975			

4.3 Dredging activity

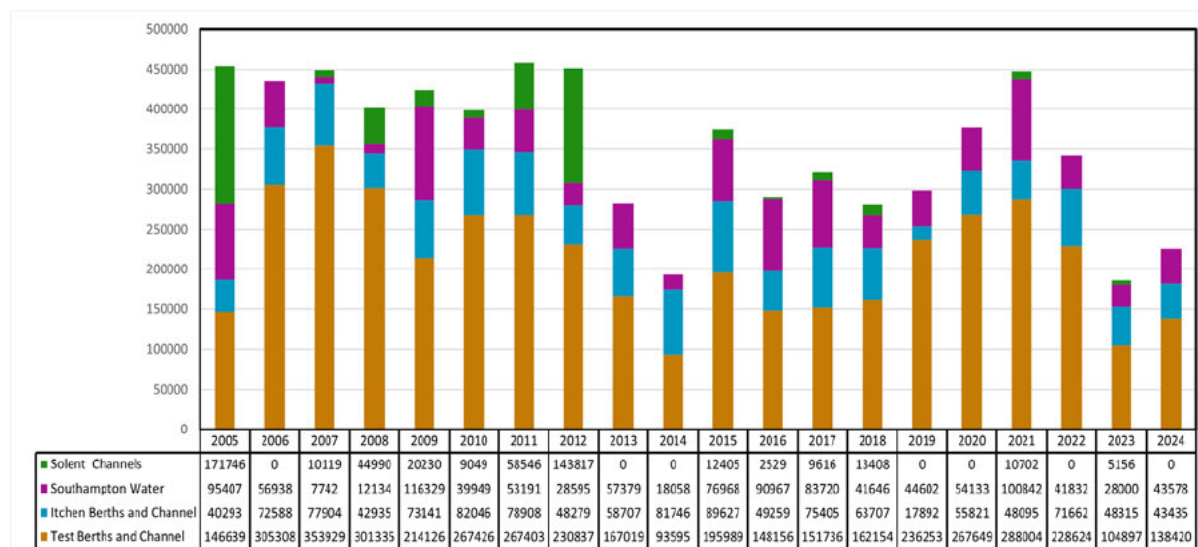
4.3.1 ABP dredging

The total volume of maintenance dredging which has been undertaken by ABP Southampton between 2005 and 2024 ranges from 186,368 m³ to 477,458 m³ per year (Table 11). This is the equivalent of approximately 242,278 to 620,695 wet tonnes per year. Volumes are low in 2023 and 2024 due to capital dredging works in those years, resulting in less volumes arising from maintenance dredging to achieve the required dredge depth. More detailed descriptions of the dredge locations, quantities and methodology over this period are provided below.

A summary of the dredge volume within each grouped maintenance dredge area is demonstrated in Graph 1 for the four areas, with a respective total volume within each area illustrated in Graph 2 to Graph 5.

Table 11. ABP Southampton maintenance dredge material volume (m³) from 2005 to 2024

Year	Dredge Volume (m ³) Total
2005	454,085
2006	326,697
2007	449,693
2008	401,394
2009	423,826
2010	398,470
2011	458,048
2012	451,528
2013	283,105
2014	381,956
2015	303,295
2016	427,665
2017	455,078
2018	477,458
2019	298,747
2020	377,603
2021	447,643
2022	342,118
2023	186,368
2024	225,433
Average	378,511

**Graph 1. ABP maintenance dredge volumes (m³) across the SHA (2005 – 2024)**

Siltation regime

The siltation regime for the ABP maintenance dredge areas are summarised together for the whole harbour area, as the entire estuary is open to tidal influence. Further details on the sediment regime of the estuary are provided in Section 3.3.

Tides are the primary influence on water movements throughout the study area, due to the sheltering from waves by the Isle of Wight, Hurst Spit and the Bramble Bank in the Solent. The dominance of the tides thereby controls the erosion, movement and deposition of sediments. In the areas of main flows,

as occurs in Southampton Water and West Solent (in relation to the Solent Channels and Bramble Turn), siltation rates are considered to be low, due to the limited SSC, natural sediment scour and transport by ebb currents (ABPmer, 2012). However, siltation rates are increased in the slower moving areas outside of the main flows. This is especially the case in the inner estuary around Dock Head and further north in the Rivers Test and Itchen. These areas are open to tidal influence, but are outside the areas of strong tidal flows to keep sediment in suspension. As a result, it is in these locations that finer sediments accrete. The highest observed sedimentation rates occur in the berths along the River Test, around Dock Head and the River Itchen (ABPmer, 2012).

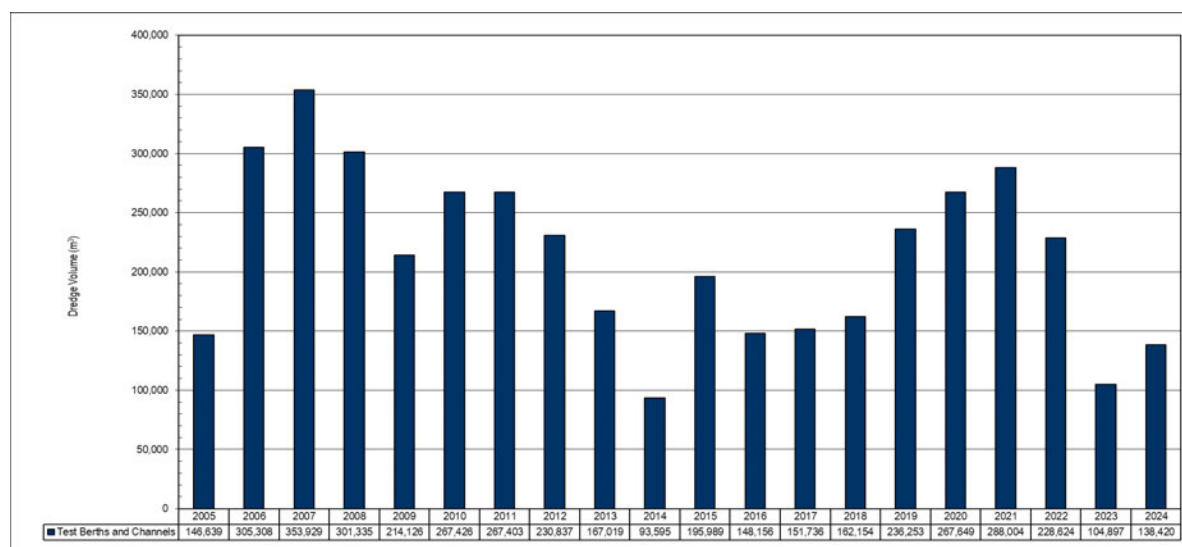
Dredge approach

Maintenance dredging of the ABP berths and approaches is undertaken regularly (see Section 4.1.1). Regular bathymetric surveys are undertaken to assess the amount of material above the nominal maintained depth. Any material above the uptake tolerance is only removed if essential which is subsequently dredged by TSHD and removed to the Nab Tower (W1060) disposal site, after which bed levelling with a plough is then used to smooth out drag head furrows. A further survey is then carried out to assess the interim changes to the seabed. This approach is principally applied across all ABP operated berths and approaches. Local variations such as berth occupancy or quay face orientation may mean that a plough is also used to pull material to a suitable position for a TSHD to collect.

Test berths and channel

Maintenance dredging of the berths and the channel within the River Test berths and channel maintenance dredge area (Figure 4) is carried out to maintain the advertised depth and enable ongoing ABP operations. Dredging mostly occurs on an annual basis, with some berths having a longer time frame between dredging, in relation to low siltation rates.

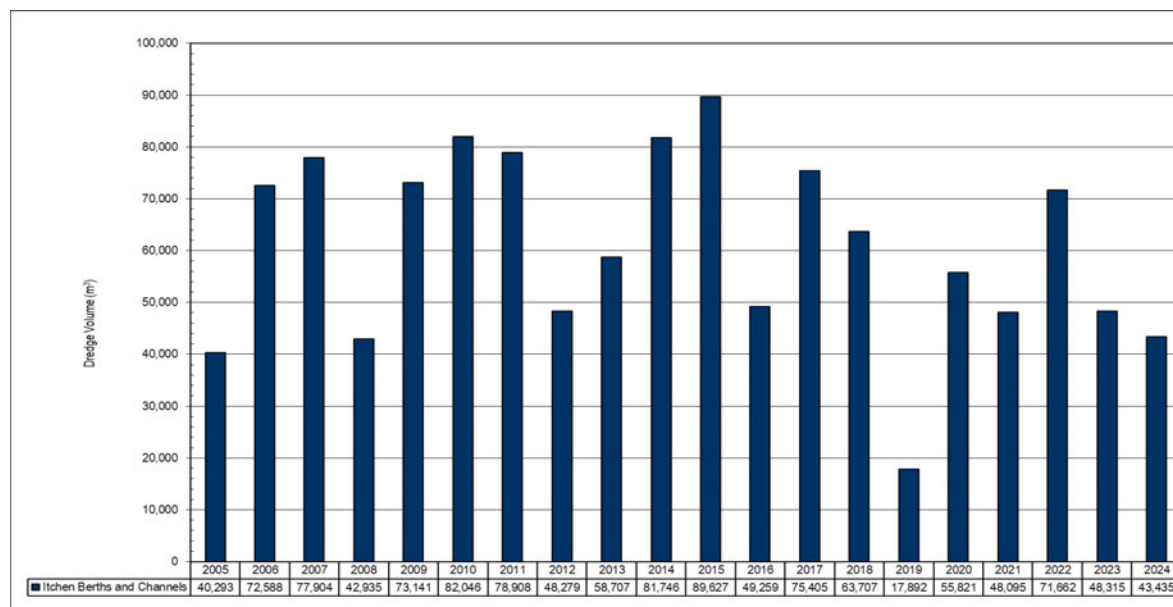
Graph 2 summarises the ABP maintenance dredge volumes for the Test berths and channel dredge area for the period 2005 to 2024. The material dredged from the Test berths and channel dredge area is predominantly composed of fine silts, clay and some sand. The *in situ* bed density is generally of the order of 1,300 to 1,400 kg/m³. The TSHD removes the material at approximately *in situ* density, whereas the average density at the point of disposal from the TSHD is generally between 1,150 to 1,250 kg/m³, depending on material type, when it was last dredged and the amount of material to be dredged. The most amount of material removed from the Test and Berth Channels was 2007 with a total of 353,929m³, and smallest volume dredged over one year was 93,595m³ in 2014.



Graph 2. ABP maintenance dredge volumes (m³) for the Test Berths and Channels (2005-2024)

Itchen berths and channel

Maintenance dredging of the berths and the channel within this area is again carried out to maintain the advertised depth and enable ongoing ABP operations. Dredging mostly occurs on a bi-annual basis, with some berths having a longer time frame between dredging. Graph 3 summarises the ABP maintenance dredge volumes for the Itchen berths and channel dredge maintenance area for the period 2014 to 2024.

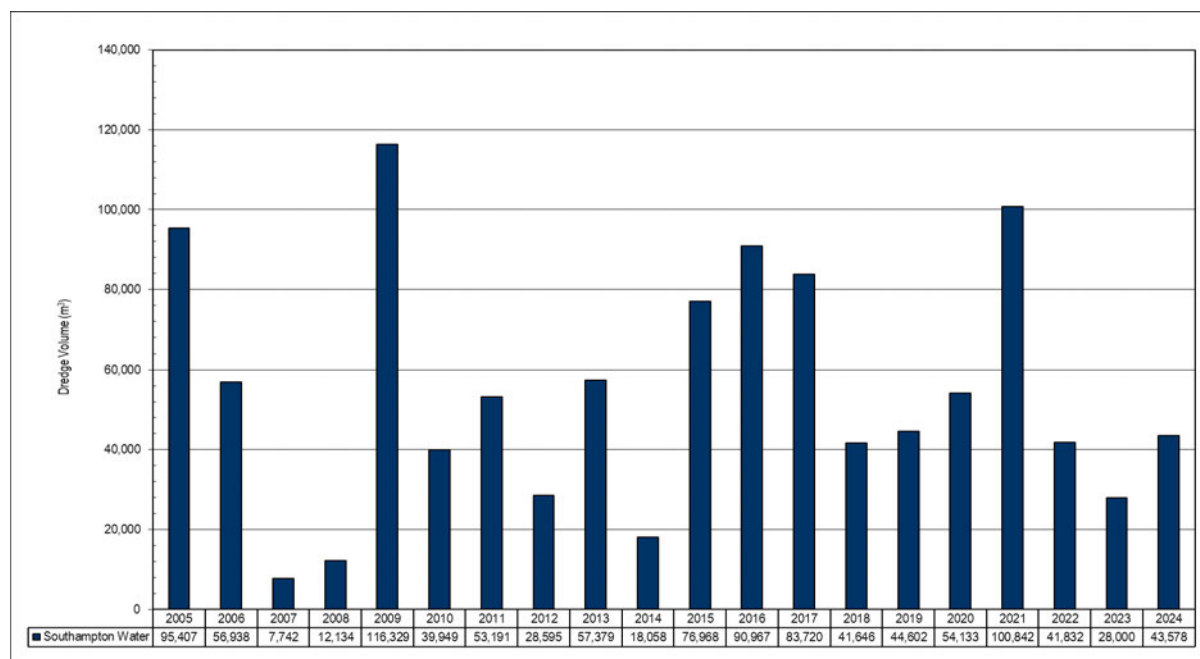


Graph 3. ABP maintenance dredge volumes (m³) for the Itchen Berths and Channels (2005-2024)

The material dredged from this dredge area is again composed of fine silts, clay and some sand. The *in situ* bed density for silt is generally of the order of 1,300 to 1,400 kg/m³. This region was heavily dredged in 2015 with a total maintenance dredge volume of 89,627 m³, and was least dredged in 2019 with a total volume of 17,892 m³.

Southampton Water

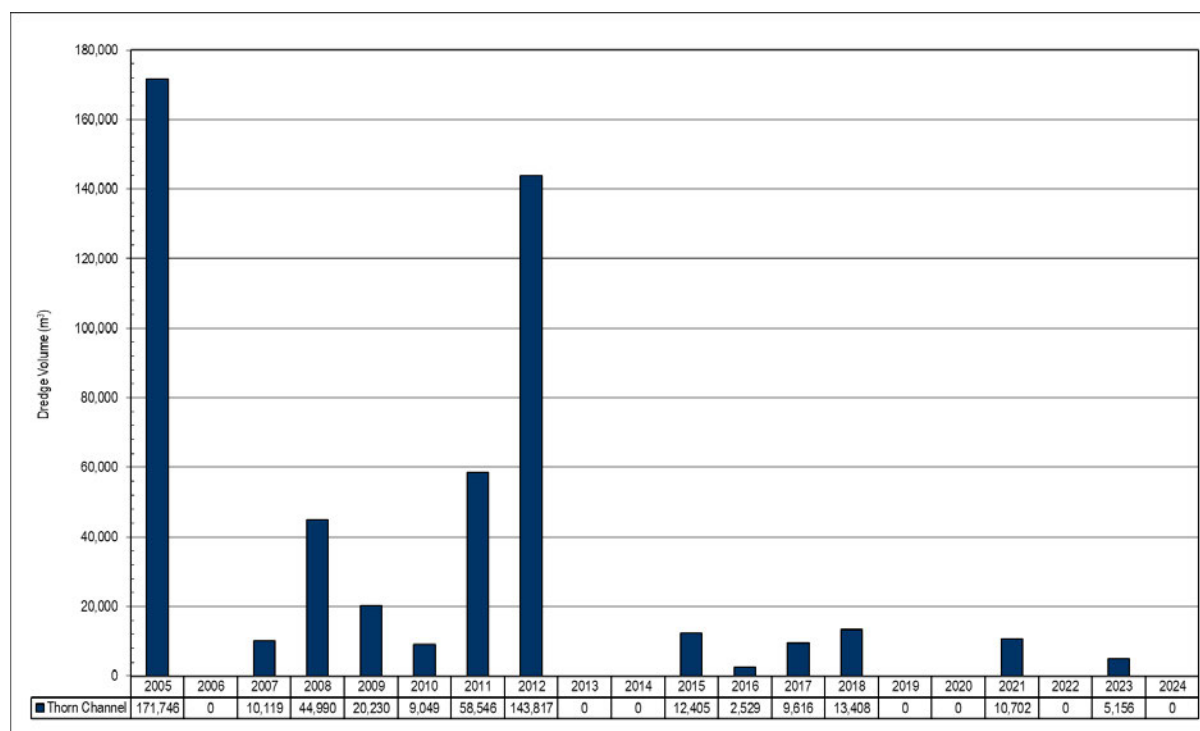
The dredge frequency within this area varies. Only the dredge pockets around Dock Head and approximately adjacent to Hythe and Netley are dredged on an annual basis. Along the rest of the main channel, the maintenance dredge frequency is approximately every two years. The largest annual dredge volumes are obtained from the Dock Head channel south dredge area. Graph 4 summarises the ABP maintenance dredge volumes for the main navigation channel dredge areas for the period 2014 to 2024. This area was dredged the most in 2009 with a total maintenance dredge volume of 116,329 m³ and it was dredged the least in 2007 with a total maintenance dredge volume of 7,742 m³.



Graph 4. ABP Maintenance Dredge Volumes (m³) for the Southampton Water Dredge Areas (2005-2024)

Solent Channels

Due to the channel depth along with the low sediment accretion rate of the Solent Channel, this maintenance dredge area is dredged infrequently with relatively small dredge volumes. The ABP maintenance dredge volumes for the Solent Channel, including the Bramble Turn, for the period 2014 to 2024 are presented in Graph 5. The most amount of dredged material removed from the Solent Channel was 171,746 m³ in 2005.



Graph 5. ABP maintenance dredge volumes (m³) for the Solent Channels Dredge Area (2005-2024)

4.3.2 Non-ABP (third party) dredging

ABP is the navigation and conservancy authority for the study area (excluding the Nab Channel, which is located outside of any SHA). Within ABP Southampton's SHA, a third party organisation wishing to carry out maintenance dredging must first seek consent from the MMO. On receipt of a Marine Licence, a Harbour Works Consent for the majority of all marine works below the HW mark is required from the SHA. This is to ensure safety of navigation and conservancy in the Port will not be compromised. It is normal practice for the Harbour Master's department to consider the application and issue consent, on behalf of the Harbour Authority. Any consents can be accompanied by certain conditions which must be strictly adhered to, and normally require records to be returned to the Harbour Master's office of the location of the works, start dates, completion dates and any surveys that maybe undertaken as part of the scheme. Marine Works are actively monitored through ABP Southampton's Vessel Traffic Services (VTS) control centre and on or near the water by ABP Marine Patrol Officers.

Whilst ABP has no direct responsibility for the dredging operations of other organisations, it is through third party consents issued for navigational purposes that ABP ensures continued compliance with conservancy concerns and the safety of navigation.

Operators of non-ABP facilities contributed advice and data to this Baseline Document. This Baseline Document is a joint exercise between all the operators on the estuary, and it is envisaged that contributory companies and facility operators will continue to work together to achieve updates when requested by the lead authority. An overview of the non-ABP (third party) maintenance dredge operators in the Southampton SHA is detailed in the following sections.

Solent Gateway Limited Marchwood Port

Marchwood Port (formally the Marchwood Sea Mounting Centre (SMC)) is located within the River Test, opposite the ABP Western Docks (Figure 4). Marchwood Port falls within the wider Port of Southampton harbour area and is owned by the Ministry of Defence and operated by Solent Gateway Ltd. In 2023, ABP acquired Solent Gateway Limited, which has a Concession Agreement to operate Marchwood Port on behalf of the DIO until 2051 where the land will revert to the Ministry of Defence including all infrastructure improvements that have been made on the site. Marchwood Port has a role in transporting material on behalf of the UK's armed forces across the world as well as receiving commercial goods. Marchwood Port comprises three jetties: Gunwharf, Falklands and Mulberry Jetty. Of these, the Falklands Jetty is the only jetty servicing military and commercial cargo vessels.

Before ABP acquired Solent Gateway Limited Ltd, Boskalis Westminster Dredging Ltd, carried out the maintenance dredging at the Marchwood Port on behalf of the Ministry of Defence. Maintenance dredging at the port was generally carried out annually and sometimes semi-annually, with the approaches and berths being dredged at this frequency in order to maintain operational and navigation depths. ABP Southampton will carry out maintenance dredging at this site as required in future under their existing Marine Licence for the disposal of maintenance dredge arisings. Maintenance dredging operations at this location are carried out by a combination of TSHD, plough and grab dredging. TSHD is the principal method with plough dredging used in isolation as bed levelling operation and in conjunction with TSHD. Backhoe dredging is used to carry out maintenance dredging in areas that are not generally accessible to a TSHD or where the material could not be ploughed into an accessible area. Material dredged is disposed at the Nab Tower (WI060) disposal site. The dredge areas and maintained depths include the Mulberry jetty and approach and Berth 5, which were all maintained at 5.2 m below CD, the Ship lift jetty which was maintained at 2.8 m below CD and Berth 6 which was maintained at 3.3 m below CD. Also, Berth 4 of the Falklands jetty and approach, which was maintained at 8.5 m below CD and Berth 3 which is maintained at 11.5 below CD. The Solent Gateway Limited dredge areas are

shown in Figure 4, while the volume of material dredged from the areas for the period 2005 to 2024 is summarised in Table 12.

Table 12. Maintenance dredging volumes (m³) for Marchwood Port approaches and berths dredge areas

Location	2004	2005	2006	2007	2008
Marchwood Port approaches and berths	15,109	0	0	0	0
	2009	2010	2011	2012	2013
	2,736	0	0	27,415	5,215
	2014	2015	2016	2017	2018
	0	0	0	33,100	0
	2019	2020	2021	2022	2023
	0	0	0	24,114	13,463
	2024				
	0				

Marina Developments Limited (MDL) Marinas

MDL currently owns and manages the following four marinas within the study area:

- Hythe Marina Village;
- Ocean Village Marina;
- Shamrock Quay; and
- Saxon Wharf.

Hythe Marina Village is located on the west bank of Southampton Water, to the south of Dock Head (Figure 5). Dredging is undertaken to maintain both the approach channel to the marina and the waiting pontoon area (outside of the lock) at typical depths of 1.7 and 2.5 m below CD respectively.

Ocean Village Marina is situated near the mouth of the River Itchen on the western bank, just north of ABP Empress Dock (Figure 10). The marina basin and entrance have historically been maintained between 2.0 and 5.0 m below CD, with deeper depths typically associated with the deep draught berth pockets near the marina entrance.

Shamrock Quay and Saxon Wharf are located close to each other on the western bank of the River Itchen, just downstream of the Northam Bridge (Figure 10). Shamrock Quay is normally maintained between 2.0 and 2.5 m below CD, whilst dredge depths at Saxon Wharf typically vary between 2.0 and 3.5 m below CD due to operational differences between the three basins. Furthermore, a deep berth pocket of 5.0 m below CD has also been historically maintained at Saxon Wharf.

Maintenance dredging across the marinas is achieved using a small backhoe dredger during the winter months (between October and April). Dredge material, comprising silt, is loaded to hopper barges and primarily disposed at the Nab Tower (WI060) disposal site; some dredge material may also be disposed of at the Hurst Fort (WI080) and Needles (WI090) disposal sites during foul weather. Dredging tends to take place annually at Shamrock Quay and every 2 years across the other marinas, although this is dependent upon requirements and the outcome of annual hydrographic surveys. The summary of the dredge volumes within the marinas from 2004 to 2024 is set out in Table 13.

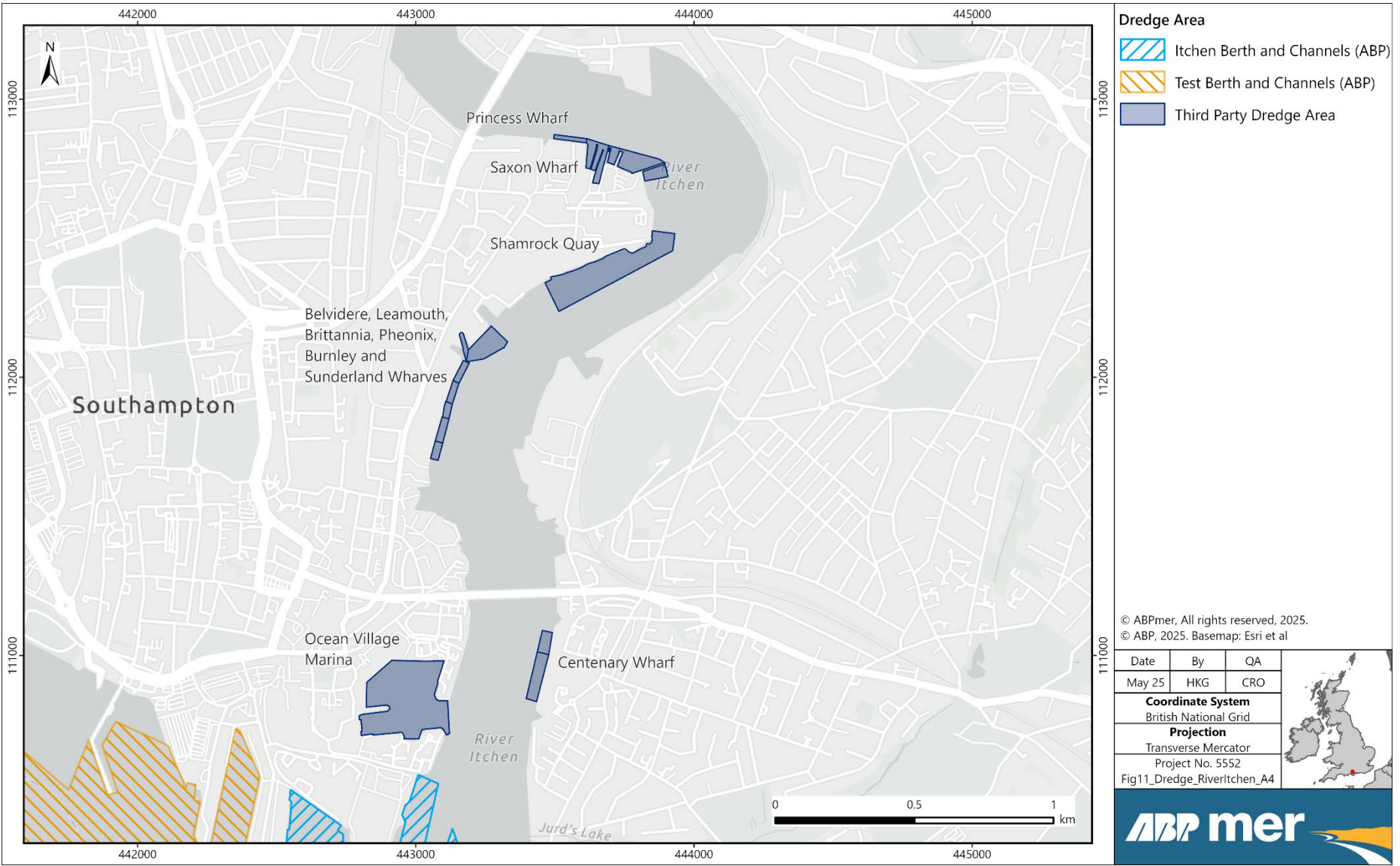


Figure 10. Third party dredge areas in the River Itchen

Table 13. Maintenance dredging volumes (m³) for MDL marina dredge areas

Location	2004	2005	2006	2007	2008
Hythe Marina Village approach	0	3,430	0	2,310	0
	2009	2010	2011	2012	2013
	0	5,200	0	2,965	2,800
	2014	2015	2016	2017	2018
	0	0	0	0	2,922
	2019	2020	2021	2022	2023
	0	2,467	0	0	4,044
	2024				
	0				
Ocean Village Marina	2004	2005	2006	2007	2008
	0	0	4,500	0	0
	2009	2010	2011	2012	2013
	625	0	3,732	0	6,485
	2014	2015	2016	2017	2018
	350	3,276	407	6,712	7,500
	2019	2020	2021	2022	2023
	4,931	0	0	2,106	5,491
	2024				
Shamrock Quay	2004	2005	2006	2007	2008
	9,466	0	1,856	0	4,350
	2009	2010	2011	2012	2013
	0	0	0	4,699	0
	2014	2015	2016	2017	2018
	2,105	0	4,479	0	0
	2019	2020	2021	2022	2023
	5,824	0	0	4,506	0
	2024				
Saxon Wharf	2004	2005	2006	2007	2008
	0	7791	0	4,205	995
	2009	2010	2011	2012	2013
	6,181	6,348	0	0	566
	2014	2015	2016	2017	2018
	4,781	0	3,622	0	0
	2019	2020	2021	2022	2023
	3,205	2,774	0	0	6,934
	2024				
	2,944				

Esso Marine Terminal

The Esso Marine Terminal is located on the western bank of Southampton Water, opposite the mouth of the River Hamble (Figure 7). The Esso facility is owned and operated by Exxon Mobile and is comprised of nine berths and an approach area, which are dredged at an annual frequency to a range of maintained depths from 5.9 to 15.2 m below CD. Bathymetric surveys are carried out prior to any dredging in order to inform the extent and requirement. Historically, dredging has been carried out by

Westminster Dredging Ltd, using a TSHD in combination with a ploughing vessel. The dredged material is disposed at the Nab Tower (WI060) disposal site. In 2013, the dredge contractor changed to UK Dredging, which has continued to undertake the maintenance dredging by TSHD. The volume of material dredged from the areas for the period 2004 to 2024 is summarised in Table 14.

Table 14. Maintenance dredging volumes (m³) for Esso and berths and approaches dredge areas

Location	2004	2005	2006	2007	2008
Esso berths and approaches	74,162	49,492	56,238	53,582	0
	2009	2010	2011	2012	2013
	56,471	68,230	0	70,331	0
	2014	2015	2016	2017	2018
	35,633	63,388	84,900	54,644	54,141
	2019	2020	2021	2022	2023
	26,767	180,163	100,764	111,592	31,443
	2024				
	74,677				

British Petroleum (BP) Hamble Marine Terminal

The BP Hamble Marine Terminal is located immediately north of the mouth of the River Hamble on the eastern bank of Southampton Water. The dredge area for the facility is the berth and approaches associated with the BP Jetty as shown in Figure 7. The berth is maintained at a depth of 13.6 m below CD and the approaches are maintained at 11.2 m below CD. These areas are dredged by UK Dredging. The area is maintained on an annual basis by a TSHD, with additional plough dredging for bed levelling. The dredge material consists of silts and fine sand. Dredged material from this site is disposed of at the Nab Tower (WI060) disposal site. A summary of the dredge volumes from this site, for the period 2004 to 2024 is set out in Table 15.

Table 15. Maintenance dredging volumes (m³) for BP Jetty box and approaches dredge areas

Location	2004	2005	2006	2007	2008
BP Jetty box and approaches	0	2,402	5,996	5,166	0
	2009	2010	2011	2012	2013
	14,846	5,498	0	2,735	4,134
	2014	2015	2016	2017	2018
	16,276	13,587	0	16,634	16,046
	2019	2020	2021	2022	2023
	6,500	48,047	0	16,905	0
	2024				
	20,751				

Hythe Marine Park

Hythe Marine Park is currently owned (and Managed) by AEW UK Core Plus Property Fund after ownership was transferred from Fairline Yachts in 2023. Fairline Yachts acquired the site in 2018. Prior to this time, the site was used as a US military base and UK RAF base Hythe. From 2007 onwards, the site was earmarked for development to support a marine business park and owned and managed by South East England Development Agency, with the establishment of vessel repair and service facility.

The site is dredged by ML (UK) Ltd using a backhoe dredger, where the material comprises silt. Up to recently, the dredging was carried out at an *ad hoc* basis, with scope for annual frequency. The dredge area for this site is shown in Figure 5, while a summary of the estimated dredge volumes since 2004 is set out in Table 16.

Table 16. Maximum annual dredge allowance (m³) from Hythe Marine Park dredge areas

Location	2004	2005	2006	2007	2008
Hythe Marine Park	56,000	15,810	16,500	10,000	11,000
	2009	2010	2011	2012	2013
	21,000	0	10,000	0	3,000
	2014	2015	2016	2017	2018
	70,000	70,000	70,000	35,000	35,000
	2019	2020	2021	2022	2023
	35,000	35,000	35,000	35,000	35,000
	2024				
	35,000				

Marchwood Wharf Industrial Area

The Marchwood Wharf industrial area comprises the industrial area known as Marchwood Wharf (previously Husbands Shipyard) and Marchwood slipway (previously Husbands Slipway), which are shown in Figure 4. The site is owned by ABP who lease out areas to other operators, ABP is responsible for dredging as part of port operation. The details of are summarised in Table 17 below.

Table 17. Maintenance dredging volumes (m³) Marchwood Wharf industrial area

Location	2004	2005	2006	2007	2008
Combined Marchwood Wharf Area Dredging	4,400	0	0	29,700	0
	2009	2010	2011	2012	2013
	0	1,554	0	0	0
	2014	2015	2016	2017	2018
	0	0	0	0	0
	2019	2020	2021	2022	2023
	0	0	0	0	0
	2024				
	0				

For Marchwood Wharf, dredging has historically been carried out approximately every 5 to 8-years, with the volume of dredge material varying between 500 m³ and 2,500 m³ at each berth, depending on the interval between dredge campaigns. At the Veolia berth in particular, there were no dredge records prior to 2010, in which 1,554 m³ of material was removed. Since this time, no further dredging has occurred and surveys are periodically carried out to inform the dredge requirement. .

This site has not been maintenance dredged for over 10 years. In 2013, the site was granted consent for a 260-berth marina including a capital dredge, however, working has yet to commence.

Veolia Energy Recovery Facility

The Veolia Energy Recovery Facility is operated by Veolia E.S Hampshire Limited located on the banks of the River Test. Additional dredging is carried out around the cooling water intake channel for the Marchwood Power Station. Following a capital dredge carried out by ML (UK) Ltd of 1,400 m³ in January 2024, maintenance dredging of the intake channel is carried out annually with up to 1,400 m³ of material being removed and disposed at the Nab Tower (WI060) disposal site.

Table 18. Maintenance dredging volumes (m³) at Veolia Energy Recovery Facility

Location	2004	2005	2006	2007	2008
Marchwood Power Station Cooling Water intake	3,200	0	0	29,700	0
	2009	2010	2011	2012	2013
	0	0	0	0	0
	2014	2015	2016	2017	2018
	0	0	0	0	0
	2019	2020	2021	2022	2023
	0	0	0	0	0
	2024				
	1,400				

Fawley Power Station

The Fawley power station is owned by Fawley Waterside Ltd and is located north of Calshot Spit. At the time of compiling this updated Baseline Document (March 2025), the facility has shut down and is being decommissioned. Dredging is carried out in the cooling water intake channel which extends from the facility, across intertidal mudflats and salt marshes, and into Southampton Water (Figure 7). The channel is maintained through WID, over a channel area of 69,155 m², to a depth of 1.5 m below CD. Maintenance dredging is periodically carried out December to February, with each campaign window lasting up to 12 weeks. Dredging was last carried out in March 2024, following an extended period of no maintenance dredging, where approximately 40,000 m³ was removed through WID. Previously maintenance had been carried out in 2004, 2007, 2009, 2012 and 2017.

Princes Wharf

Princes Wharf is located on the west bank of the River Itchen, immediately downstream of Northam Bridge (Figure 5). The facility is operated by European Metal Recycling (EMR) Ltd. In June 2020, a full plough of the berth was undertaken using a Marine Licence Exemption to bring the levels to 2.00 m below CD.

Aggregate Wharves

The aggregate wharves from north to south include Belvedere, Leamouth, Britannia, Phoenix, Burnley and Sunderland Wharves (Figure 10). Of these, only Leamouth and Burnley Wharf undergo maintenance dredging.

Belvedere and Leamouth Wharves are operated and managed by CEMEX UK. There is no systematic dredging programme in place to cover Belvedere Wharf. CEMEX UK obtained a licence in 2022 to undertake a capital dredge at Leamouth Wharf, along with a 10 year maintenance dredge licence. Capital dredging was undertaken in March 2022 by ML UK Ltd (Dredging Division) with a proposed removal of 2,600 m³ and disposal at the Nab Tower (WI060) disposal site.

5 Sediment Quality

The chemical characteristics of the surface sediments within the study area are described in this section. As part of the marine licensing process, sediment samples are routinely collected within respective dredge areas, firstly to support the initial marine licence application/renewal and subsequently to provide interim data. The samples are analysed by MMO-approved laboratories and the results are reviewed to determine the ongoing suitability for dredging works and, if required, disposal at sea.

There are no formal quantitative Environmental Quality Standards (EQS) for the concentration of contaminants in sediments.

Cefas has prepared a series of Guideline Action Levels (ALs) to assist in the assessment of dredged material and its suitability for disposal to sea (Appendix A). In general, contaminant levels in dredged material below Action Level 1 (AL1) are of no concern and are unlikely to influence the licensing decision. However, dredged material with contaminant levels above Action Level 2 (AL2) is generally considered unsuitable for disposal at sea. Dredged material with contaminant levels between AL1 and AL2 may require further consideration before a decision can be made. The Cefas Guideline Action Levels should not be viewed as pass/fail thresholds. However, these guidelines provide an appropriate context for consideration of contaminant levels in sediments and are used as part of a 'weight of evidence' approach to assessing dredged material.

The reference Cefas ALs, along with the results of sediment samples from the study area are tabulated and shown in Appendix A. The reference ALs and analysis results (of surface sediments) from the study area in relation to ABP and third party dredging activity are summarised in Appendix A. For ease of comparison, the tables have been coloured with the current guidance ALs (with blue for exceedance of AL1, and red for exceedance of AL2).

Cefas do not routinely test for the whole range of contaminants, as this is determined on a case-by-case basis depending on a number of factors. However, the chemical characteristics of the sediments are described in terms of a range of chemical parameters, listed below:

- Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) and other metals (aluminium, boron, iron, manganese, selenium, silver and vanadium);
- Organotins (Tributyltin (TBT) and Dibutyltin (DBT));
- Total petroleum hydrocarbons (TPH) (also referred to as Total hydrocarbon content (THC);
- Polycyclic aromatic hydrocarbons (PAHs);
- Polychlorinated biphenyls (PCBs);
- Ammonia; and
- Sulphide.

In addition, sediment samples are often analysed by MMO-approved laboratories for particle size distribution to determine the physical sediment composition (i.e. proportion of silt, sand and gravel in individual samples). Chemical analysis of sediment samples for organochlorine pesticides (OCPs) and polybrominated diphenyl ethers (PBDEs) may also be undertaken due to known historic contamination events or risk from anthropogenic inputs in the area (e.g. agricultural runoff, industrial setting).

Prior to the collection of sediment samples, it is standard practice for the applicant to request a 'Sample Plan' from the MMO, who will consult Cefas to determine the appropriate suite of chemical analysis.

5.1 Sediment quality within the study area

With respect to the study area, analysis has routinely been undertaken throughout Southampton Water and the Rivers Test and Itchen in respect of capital and maintenance dredge activities. This section provides a summary of available sediment quality information, taken primarily from Cefas data records, MMO sediment quality licence information, ABP Southampton records and contributions from third party dredge organisations. It should be noted that the text presents a combined summary (i.e., it does not differentiate between different dredge operators) and includes sediment quality from both capital and maintenance dredge projects. Where capital project samples are included, in some instances, this material will have been removed by the capital scheme itself.

Sediment quality data from a number of locations within the study area, for the period 2001 to 2022, is presented in Appendix A. The locations sampled are shown on Figure 11 and Figure 12,. The sediment quality data that is included in this summary is based on samples obtained from the seabed surface as opposed to those obtained at depth. Within the summary below, the most recent data is considered first. The data included in the relevant tables in Appendix A, however, is listed in succession from old to new (allowing for future updates).



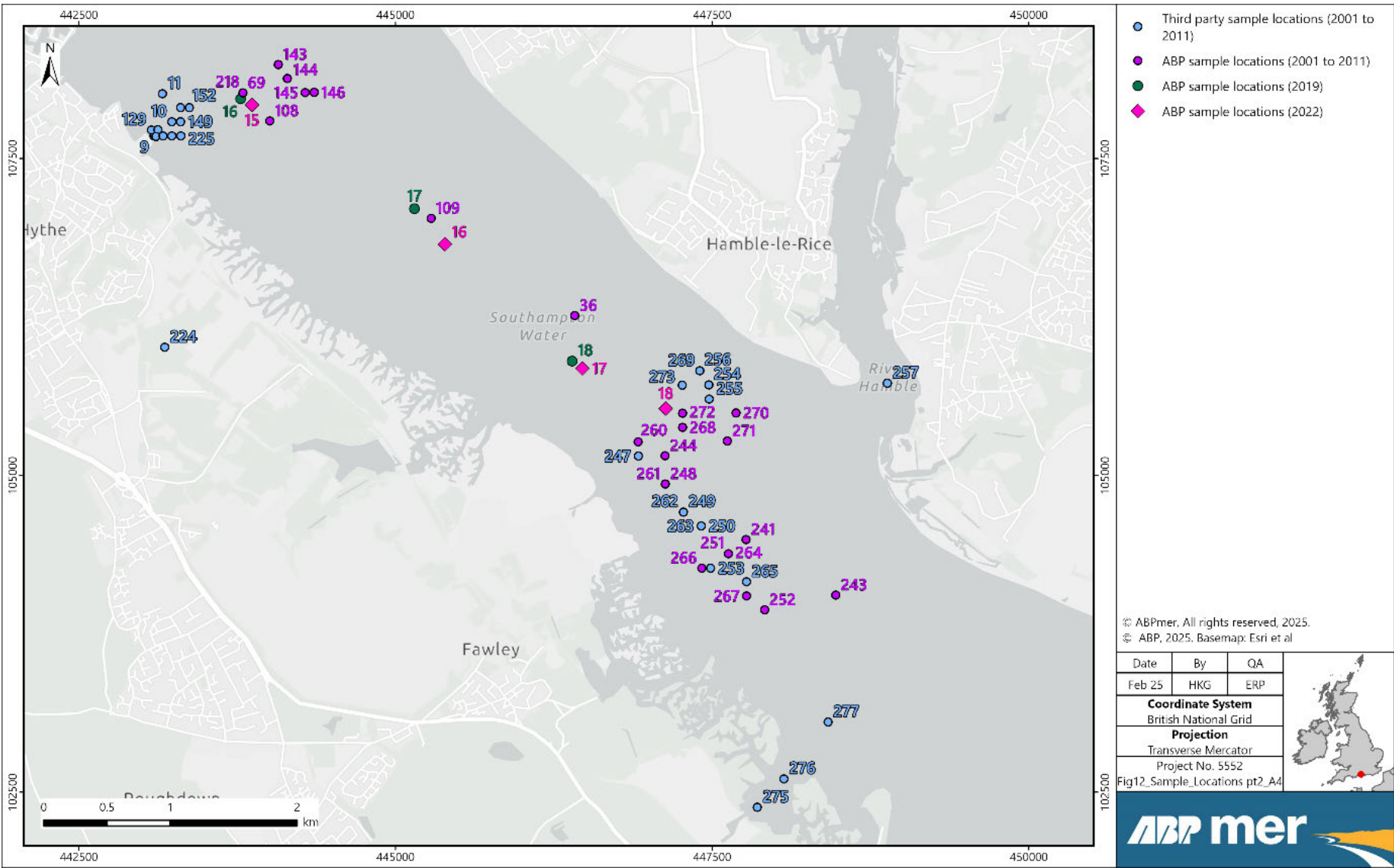


Figure 12. Sediment quality sample locations in Southampton Water and the River Hamble

5.1.1 Metals

Data from the study area for the period 2001 to 2022 indicate that metal concentrations within the Southampton Water, the Rivers Test and Itchen are typically below Cefas ALs or slightly above Cefas AL1. There are two sediment samples that exceeded Cefas AL2 for lead and mercury. These were both recorded in 2011 from the River Itchen dredge area (Table A8). The lead sample was located approximately mid-channel off from Princes Wharf, while the mercury sample was in proximity to the slipway associated with the same Wharf (Figure 11). Both of these were considered to be isolated instances and did not at the time, on balance of information, preclude the issue of a Marine Licence.

5.1.2 Organotins

The levels of DBT and TBT for the period 2001 to 2022 are generally below Cefas ALs or slightly above Cefas AL1. However, there are three sediment samples that exceeded Cefas AL2 for TBT only. Two of these samples were from the SCT berths in the River Test dredge area taken in 2005 and 2022 (Figure 11, Table A2). The third sample is from 2011 at the Ro/Ro berth at the Vehicle Handling Terminal, also within the River Test dredge area (Figure 11). There are no occurrences of DBT above Cefas AL2.

5.1.3 Polychlorinated biphenyls (PCBs)

PCB substances are not typically sampled within the study area. The results that are available from the period 2001 to 2022 have been presented in Table A5 to Table A7, Table A11 to Table A13 and Table A17 to Table A19 for the Rivers Test, Itchen and Southampton Water dredge areas respectively. Of the sampled data, the occurrences of PCBs are predominantly below Cefas ALs, with only isolated instances above Cefas AL1 and one occurrence above Cefas AL2. The occurrence above Cefas AL2 is for PCB's sum of 25 congeners from a sample taken in 2009 which was located in proximity to the jetty associated with the Husbands Shipyard (now referred to as Marchwood Wharf), in the River Test Dredge area (Figure 11, Table A7).

5.1.4 Polycyclic aromatic hydrocarbons (PAHs)

Analysis of sediment samples for PAHs has not been routinely carried out. The results that are available from the period 2001 to 2022 have been presented in Table A3, Table A4, Table A9, Table A10, Table A15 and Table A16 for the Rivers Test, Itchen and Southampton Water dredge areas respectively. Of the sampled and analysed data, many locations exceed Cefas AL1 for a range of PAH substances. This includes Total Hydrocarbons (THC) for which nearly all samples exceed Cefas AL1. However, from the most recent data (2022), only two samples exceeded Cefas AL1. It should be noted that there is no AL2 for PAHs.

5.1.5 Other contaminants

Polybrominated Diphenyl Ethers (PBDEs) and organochlorine pesticides (OCP) have not regularly been tested in sediment samples as part of the requirements for testing under the current maintenance dredging marine licence. However, evidence from sediment analysis undertaken for the Southampton Container Terminal Berth Access Dredge project, a capital dredge of four of the SCT berths (Section 3.1.3) found that all tested PBDEs and OCPs were below the limit of detection with the exception of BDE2009 (though concentrations were still very low). There are no ALs for either PBDEs or OCPs.

5.2 Summary of sediment quality

The sediment quality of material that is maintenance dredged from Southampton Water and the Rivers Test and Itchen has been routinely considered by Cefas on behalf of the MMO as part of the marine licensing process. A restriction based on sediment quality was previously placed on a historic licence from 2004, restricting dredging activities from the King George V dry dock due to elevated levels of TBT. Other than this exclusion, no further restrictions have been placed on maintenance dredging due to contamination issues.

A review of sediment contamination levels within samples across the SHA area indicate in general, the levels are typically below Cefas ALs or slightly above Cefas AL1. Where contamination levels in sediment samples exceeded Cefas AL1, these concentrations have been taken into account by the licensing authority, and have been deemed acceptable for disposal to sea.

6 Licence Information

6.1 ABP licence information

On 21 October 2015, a Marine Licence L/2015/00330/1 was obtained by ABP Southampton, replacing the previous licence L/2011/00233/1. The current licence relates to maintenance dredging of material originating from the following locations:

- River Itchen Berths and Channels;
- River Test Berths and Channels;
- Southampton Water; and
- Solent Channels.

Marine Licence L/2015/00330/4 permits ABP Southampton or any agent, contractor or sub-contractor acting on their behalf under this licence (UK Dredging and ML (UK) Ltd) to remove up to 675,000 tonnes of maintenance material per annum from the above locations between 1 November 2015 and 31 October 2025. The licence also permits the disposal of this maintenance material at the Nab Tower (WI060) disposal site over the same period. Table 19 provides an overview of ABP Southampton's recent licence history.

Table 19. ABP Southampton licence history

Licence Reference	Details
32409/04/0 Issued 18 August 2004. Valid 20 August 2004 to 19 August 2007.	600,000 tonnes/year (1,800,000 tonnes in total). Maintenance dredging from Southampton (Solent, Itchen, Test boundaries defined). Deposit of dredged material at the Nab Tower (WI060) disposal site. Licence includes following agents or contractors: UK Dredging. Licence includes use of the following vessels: UKD Bluefin, UKD Marlin and UKD Dolphin. Area called "Upper Swinging Ground" close to the "King George V Dock" in the River Test excluded from permitted maintenance dredging area until future notification from Licensing Authority.
32409/04/1 Issued 21 September 2004. Valid 21 September 2004 to 19 August 2008.	Replaced licence 32409/04/0. Length of licence reduced. Total dredged material reduced to 600,000 tonnes.
34003/08/0 Issued 19 August 2008. Valid 14 September 2008 to 13 September 2011.	600,000 tonnes/year (1,800,000 tonnes in total). Maintenance dredging boundaries include River Itchen Berths and Channels, River Itchen Berths and Channels 2, Southampton Water and Solent Channels. Barges 'Split 2' and 'Split 3' added to licence. Licence condition added: (9.5) The Licence Holder must ensure that at such time that the EA Fishery Officer informs ABP's hydrographer that the Autumn salmon 'run' has commenced, no dredging will take place North of the Dock Head for a period of three days. Subsequent to this condition, there will be no restrictions to dredging in the areas riverward of the Dock Head boundary.

Licence Reference	Details
L/2011/00233 Issued 22 September 2011. Valid 14 September 2011 to 13 September 2014.	Maintenance dredging boundaries include River Itchen Berths and Channels, River Test Berths and Channels, Southampton Water and Solent Channels. Dredgers 'UKD Orca' and 'Witton II' added to licence. ML (UK) Ltd added as an agent to the licence. Licence condition added: (3.2.9) The Licence Holder must submit their disposal returns on a bi-annual basis, 31 January and the 31 July each year, showing the monthly quantities of deposits at each location.
L/2011/00233/1 Issued 12 March 2012. Valid 12 March 2012 and 13 September 2014.	Maintenance dredging of 600,00 tonnes/year, 1,800,00 tonnes in total over a three year period. Replaced licence L/2011/00233, retaining the previous dredging boundaries of River Itchen Berths and Channels, River Test Berths and Channels, Southampton Water and Solent Channels. Removal of licence condition (3.2.4 of L/2011/00233) which stated the licence holder may not dredge or intentionally/recklessly disturb material north west of a line running from 50 54.482 N, -1 27.599 W to 50 54.225 N, -1 27.873 W whilst further investigations are undertaken of the material. Investigations proved that material in this location was not toxic or harmful.
L/2015/00330/1 Issued 21 October 2015. Valid 1 November 2015 and 31 October 2025.	Current Marine Licence held by ABP Southampton. Replaced licence L/2011/00233/1. 675,000 tonnes/year (6,750,000 tonnes in total over a ten year period). Dredge boundaries updated to River Itchen Berths and Approaches, River Test Berths and Channels, Southampton Water, Solent Approaches and Nab Channel. Licence specific conditions added: 5.2.4 the licence holder must inform MMO of quantities of material disposed by 15 February for months August to January and by 15 August for February to July. Condition 5.2.5 states sampling must be completed by the end of the licence's 1st year and every subsequent 3 years.
L/2015/00330/2 Issued 23 January 2017 Valid 27 January 2017 and 31 October 2025.	Internal MMO variation to remove coordinates from licence L/2015/00330/1 of overlapping dredge areas of other marine licence applications within the consented area.
L/2015/00330/3 Issued 2 April 2019. Valid 2 April 2019 and 31 October 2025.	Variation request raised by the MMO internally in order to enable ABP Southampton to submit disposal returns to the MMO via the online Marine Case Management System.
L/2015/00330/4	Variation request raised by ABP to update the contact information.

6.2 Current Non-ABP (third party) licence information

At the time of writing (March 2025), seven other organisations currently hold Marine Licences to dispose of maintenance dredged material at the Nab Tower (WI060) disposal site. RWE Npower plc previously held a Marine Licence for works in the vicinity of Fawley Power Station located within Southampton Water (L/2012/00028/1); however, the licence expired on 16 January 2013 and the site closed in March 2013. Other previous licences held within Southampton Water include Westminster Dredging Company Limited (L/2014/00051/1) who previously held a licence for Marchwood Seamounting Centre; however the licence expired on 2 March 2017.

6.2.1 AEW Core Plus Property Fund L/2017/00116/2

A Marine Licence (L/2017/00116/1) was obtained by Oceanic Estates Ltd in relation to Hythe Marine Park to allow for annual maintenance dredging. This is a renewal of a previous licence, L/2013/00109/6, held by the Homes and Communities Agency. In March 2023, the Marine Licence was transferred to AEW Core Plus Property Fund (L/2017/00116/2). The licence is valid from 26 April 2017 to 25 April 2027. Up to 35,000 m³ per year of maintenance material dredged from the site is permitted for disposal at the Nab Tower (WI060) disposal site, as well as small quantities at the Needles and Hurst Fort disposal sites (bad weather sites). As part of the Marine Licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.1 The Licence Holder must ensure all reasonable precautions are taken to prevent the disposal of man-made debris at sea. Any man-made material must be separated from the dredged material and disposed of at land;

5.2.3 The licence holder must inform the MMO of the location and quantities of material disposed of each month under this licence. This information must be submitted to the MMO by 15 February each year for the months August to January inclusive, and by 15 August each year for the months February to July inclusive;

5.2.4 The licence holder must ensure that during the course of disposal, material is distributed evenly over the Nab Tower (WI060) disposal site;

5.2.5 Reasonable precautions should be taken to minimise the re-suspension of sediment during the works. Best practice measures should be put in place to ensure there is no overspill of dredged material or water from the hopper barge receiving the dredge arisings;

5.2.7/8 Maintenance dredged material from Hythe Marine Park may only be disposed of at Nab Tower (WI060) at a rate of 35,000 m³ per annum except during instances of foul weather. Foul weather sites (no greater than 10% (4,200 tonnes) per annum) are Hurst Fort (WI080) and Needles (WI090).

6.2.2 Marina Developments Ltd L/2014/00388/1

Marina Developments Ltd obtained a Marine Licence (L/2024/00411/1), a renewal of a previous licence (L/2014/00388/3), to undertake maintenance dredging works to retain basin depths at design levels at the Ocean Village Marina, Southampton. A detailed programme has not been determined, although works will be undertaken annually between the months of October and April, with a typical dredge period of 1 to 4 weeks dependant on the volume of material. The licence is valid from 9 October 2024 to 30 November 2034. The dredged material is permitted for disposal primarily at the Nab Tower (WI060) disposal site. Maximum annual disposal volumes is 10,000 m³ per year. As part of the marine licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.4 The licence holder must undertake an assessment, detailing reasonable alternative uses for the dredged material must be submitted to the MMO at least six weeks prior to the end of the month of October in years three, six and nine;

5.2.6 The disposal site Hurst Fort (WI080) is permitted to be used for up to 10% of annual dredge material, equivalent to 1,000 m³ per licence year. In the event of adverse weather conditions preventing safe travel to the primary disposal site (Nab Tower WI060);

5.2.7 A sediment sampling plan request must be submitted to the MMO at least six months prior to the end of years, three, six and nine from the date of licence issue;

5.2.8 The licence holder must ensure that during the course of disposal, material is distributed evenly over the Nab Tower (WI060) disposal site and in the event of adverse weather conditions preventing safe travel to the primary site, Hurst Fort (WI080).

6.2.3 Marina Developments Ltd L/2014/00407/2

Marina Developments Ltd obtained a Marine Licence (L/2024/00368/1), a renewal of a previous licence (L/2014/00407/2), to undertake maintenance dredging works to retain basin depths at design levels at Shamrock Quay. A detailed programme has not been determined, although works must be undertaken annually between the months of November and March. The licence is valid from 30 October 2024 to 15 March 2035. The dredged material is permitted for disposal primarily at the Nab Tower (WI060) disposal site, but also at small quantities at the Needles and Hurst Fort disposal sites (bad weather sites). The maximum disposal volume is 10,000 m³ per year. As part of the marine licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.3 Sediment sampling and analysis must be completed by a laboratory validated by the MMO and submitted at least eight weeks prior to 30 October 2027, 30 October 2030, and 30 October 2033;

5.2.4 The licence holder must provide an assessment of alternative uses for the sediment at the sampling review stages in years 3, 6 and 9. The MMO request that this be submitted at least 8 weeks prior to the end of years 3, 6 and 9;

5.2.10 Deliberate overfilling of the split hopper or bottom dumping barge, leading to overspill of the silt material and / or water, is not permitted;

5.2.12 No more than 10,000 m³ per annum must be dredged;

5.2.13 No more than 75,000 m³ must be dredged over the 10-year period of the licence;

5.2.14 The disposal site Hurst Fort WI080 must only be used in the event of a bad weather event. This site can only receive a maximum of 10% of the total disposal quantity in each dredge period;

5.2.15 The material to be disposed of within disposal sites Nab Tower WI060 and Hurst Fort WI080 must be placed within the boundaries of that site;

5.2.16 Dredging and disposal activities must only take place between 15 November to 15 March inclusive;

5.2.17 Dredging must not exceed average depths of 2 metres below chart datum across the whole dredge site.

6.2.4 Marina Developments Ltd L/2015/00355/2

Marina Developments Ltd obtained a Marine Licence (L/2015/00355/2) to undertake maintenance dredging works to retain approach channel depths at design levels for Hythe Marina Village and approach channel. A detailed programme has not been determined, although works will be undertaken annually between the months of October and April, with a typical dredge period of about 3 weeks dependant on the volume of material. The licence is valid from 1 May 2016 to 30 April 2026. The dredged material is permitted for disposal primarily at the Nab Tower (WI060) disposal site, but also at small quantities at the Needles and Hurst Fort disposal sites (bad weather sites). Maximum disposal volumes at the Nab Tower (WI060) disposal site are 7,700 tonnes per year (wet weight). As part of the Marine Licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.7 The licence holder must ensure that during the course of disposal, material is distributed evenly over the disposal site Nab Tower (WI060);

5.2.8 The Licence Holder must ensure that no more than 7,700 tonnes of wet weight dredged material is disposed of at Nab Tower (WI060) per annum. The Licence Holder must also ensure that no more than 10% of the annual tonnage is disposed of at Hurst Fort (WI080) or The Needles (WI090) in poor weather conditions;

5.2.10 Measures must be put in place to ensure there is no overspill of dredged material or water from the hopper barge receiving the dredge arisings. The barge must be stabilised to prevent rolling and not overfilled. Industry best practice must be adhered to in order to minimise resuspension of sediment during the dredging activity.

6.2.5 Esso Petroleum Company Ltd L/2016/00108/3

Esso Petroleum Company Ltd obtained a Marine Licence (L/2016/00108/3) to undertake maintenance dredging works to retain berth pocket depths at design levels for the Fawley Marine Terminal. Maintenance dredging is anticipated to be carried out at least annually, occasionally twice a year over the 10-year period of the licence. The licence is valid from 15 April 2016 to 14 April 2026. The dredged material is permitted for disposal at Nab Tower (WI060) disposal site, with maximum disposal volumes of 140,000 tonnes per year (wet tonnes). As part of the Marine Licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.4 No more than 140,000 wet tonnes must be dredged and disposed of in each year of the licence, from 15 April until 14 April the following year, except for 15 April 2016 to 14 April 2017, when no more than 217,000 wet tonnes must be dredged and disposed of;

5.2.6 The material to be disposed of within the Nab Tower (WI060) disposal site must be placed within the boundaries of that site;

5.2.7 During the course of disposal, material must be distributed evenly over the Nab Tower (WI060) disposal site;

5.2.9 The licence holder must submit a sediment sampling plan request at least 6 months prior to the end of years 3, 6 and 9 from the date of issue and based on the outcome of the results of the analysis sampling may then be undertaken every 3 years. The sediment sampling and analysis must be completed by a laboratory validated by the MMO at least 6 weeks prior to the end of years 3, 6 and 9 from the date of issue;

5.2.10 The licence holder must provide an assessment of alternative uses for the sediment at the sediment sampling review stages in years 3, 6 and 9 from the date of issue and therefore this report must be submitted least 6 weeks prior to the proposed commencement of the licensed activities.

6.2.6 BP Oil UK Ltd L/2017/00105/1

BP Oil UK Ltd obtained a Marine Licence (L/2017/00105/3) to undertake maintenance dredging works to retain berth pocket and approach channel depths at design levels for the BP Hamble Jetty. Maintenance dredging is anticipated to be carried out at least annually, occasionally twice a year in spring and autumn. The licence is valid from 4 April 2017 to 3 April 2027. The dredged material is permitted for disposal at Nab Tower (WI060) disposal site, with maximum disposal volumes of 76,500 tonnes per year (wet tonnes). As part of the Marine Licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.1 The dredging must only be undertaken using a Trailing Suction Hopper Dredger (TSHD) with support from plough dredging for bed levelling;

5.2.2 There must be minimal overspill of silt material or water from the hopper or bottom dumping barge receiving the material;

5.2.6 The dredged material must be distributed as evenly as possible over the Nab Tower (WI060) disposal site during the course of each disposal;

5.2.7 The total amount of material deposited at the Nab Tower (WI060) disposal site must not exceed 76,500 wet tonnes per annum;

5.2.8 The licence holder must submit a sediment sampling plan request at least 6 months prior to the end of years 3, 6 and 9 from the date of issue. The sediment sampling and analysis must be completed by a laboratory validated by the MMO at least 6 weeks prior to the end of years 3, 6 and 9 from the date of issue;

5.2.11 Pre and post bathymetric surveys must be undertaken and uploaded to the MMO's online system, along with a difference calculation, within 4 weeks of each campaign being completed.

6.2.7 Southampton International Boat Show Ltd L/2017/00058/1

Southampton International Boat Show Ltd obtained a Marine Licence (L/2017/00058/1) to undertake maintenance dredging works to overcome natural siltation and thus enable the long-term operational suitability of the site. Maintenance dredging is expected to be carried out every 2 years over the 10-year period of the licence. The licence is valid from 27 February 2017 to 26 February 2027. The dredged material is permitted for disposal at the Nab Tower (WI060) disposal site, with maximum disposal volumes of 4,200 tonnes biennially. As part of the Marine Licence, the following specific conditions

were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.1 Material must be disposed of within the Nab Tower (WI060) disposal site with up to 10% of this total volume (up to 420 tonnes maximum) biennially, deposited to Hurst Fort (WI080) or Needle (WI090) as a bad weather site;

5.2.2 No more than 4,200 tonnes wet weight must be disposed of at the Nab Tower (WI060) disposal site biennially, with up to 10% of this total volume (up to 420 tonnes maximum) biennially, deposited to Hurst Fort (WI080) or Needles (WI090) as a bad weather site;

5.2.3 During the course of disposal, material must be distributed evenly over the Nab Tower (WI060), Hurst Fort (WI080) and Needles (WI090) disposal sites;

5.2.5 Backhoe dredging must be used during the dredging activity;

5.2.7 The licence holder must submit a sediment sampling plan request at least 6 months prior to the end of year 5 of this licence from the date of issue. The sediment sampling and analysis must be completed by a laboratory validated by the MMO at least 6 weeks prior to the end of year 5 from the date of issue. Samples must be collected, analysed and approved by the MMO in consultation with Cefas and the Environment Agency prior to dredging in the sixth year of this licence.

6.2.8 Fawley Waterside Limited L/2024/00027/1

Following the closure of the Fawley Power Station, Fawley Waterside Limited obtained a Marine Licence (L/2024/00027/1) to undertake maintenance by WID at the former Fawley Power Station intake channel. Maintenance dredging is expected to be carried out every 3 to 4 years from December to February over the 10-year period of the licence. The licence is valid from 24 January 2024 to 23 January 2034. As part of the Marine Licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.3 A sediment sampling plan request must be submitted to the MMO at least 6 months prior to the end of year 4 from the date of issue. The sediment sampling and analysis must be completed by a laboratory validated by the MMO at least 6 weeks prior to the end of year 5 from the date of issue.

6.2.9 Veolia E.S Hampshire Limited L/2023/00347/1

Veolia E.S Hampshire Limited obtained a Marine Licence (L/2023/00347/1) to facilitate a capital dredge of the cooling water intake channel in 2023 and an annual maintenance dredge to maintain this channel as required from 2024 to 2033 at the Energy recovery facility on the banks of the River Test. The dredged material is permitted for disposal at the Nab Tower (WI060) disposal site, with maximum disposal of 14,000 m³. The licence is valid from 28 September 2023 to 27 September 2033. As part of the Marine Licence, the following specific conditions were itemised within the licence as a result of advice received from the consenting consultation process and conditions the MMO wished to add to the dredge operation.

Licence Condition (referencing condition number):

5.2.6 All Pre and post dredge surveys must be submitted, together with an interpretation of the difference between the survey results and a volume calculation within 4 weeks of completion of each dredge campaign;

5.2.6 All works must take place during the months of January and February, inclusive;

5.2.7 A revised Water Framework Directive Assessment must be submitted within 6 months of the publication of the new "2028" river basin management plan (RBMP), unless otherwise agreed with the MMO. The licensed activities must not recommence until written approval is provided by the MMO;

5.2.9 A sediment sampling plan request must be submitted to the MMO at least 6 months prior to the end of years 3, 6 and 9 from the date of issue. The sediment sampling and analysis must be completed by a laboratory validated by the MMO at least 6 weeks prior to the end of years 3 and 6 from the date of issue. The dredge and disposal activities must not recommence until written approval is provided by the MMO.

7 Environmental Information

This section of the Baseline Document introduces national and international designated sites and features in the study area (Section 7.1), and associated conservation advice (Section 7.3), followed by details of relevance to the WFD, including water body status, designated bathing waters and Shellfish Water Protected Areas (Section 7.4).

7.1 Designated sites and features

The nature conservation importance of Southampton Water and the surrounding area is recognised through a number of protected sites (Figure 13 and Figure 14). The following sections provide further information on the interest features of each of the relevant protected sites.

7.1.1 Special Protection Areas

The Birds Directive (79/409/EEC) requires all member states to identify areas to be given special protection for the rare or vulnerable species listed in Annex 1 of the Directive (Article 4.1), for regularly occurring migratory species (Article 4.2) and for the protection of wetlands, especially wetlands of International importance. This legislation has since been transposed into UK legislation by the Habitats Regulations.

An overview of the reasons for designating the SPAs that occur within the study area is included in Table 20. The locations of these sites are shown in Figure 13. The bird species using the marine component of the SPAs at the time of classification are listed in Appendix B.

Table 20. SPAs within the study area

Site	SPA Qualifying Features		
	Article 4.1	Article 4.2	Sub Features
Solent and Southampton Water	✓	✓	Sand and shingle, saltmarsh, intertidal mudflats and sandflats, shallow coastal waters, boulder and cobble shores, mixed sediment shores.
Solent and Dorset Coast	✓	-	This site is located along the coasts of Dorset, Hampshire, Isle of Wight and West Sussex and adjacent areas offshore. No sub-features are specifically mentioned in the citation.
Portsmouth Harbour	-	✓	Saltmarsh, intertidal mudflats and sandflats, shallow coastal waters.
Chichester and Langstone Harbours	✓	✓	Sand and shingle, shallow coastal waters, shingle, saltmarsh, intertidal mudflats and sandflats, mixed sediment shores.

Source: English Nature, 2001a; Natural England, 2019, 2016

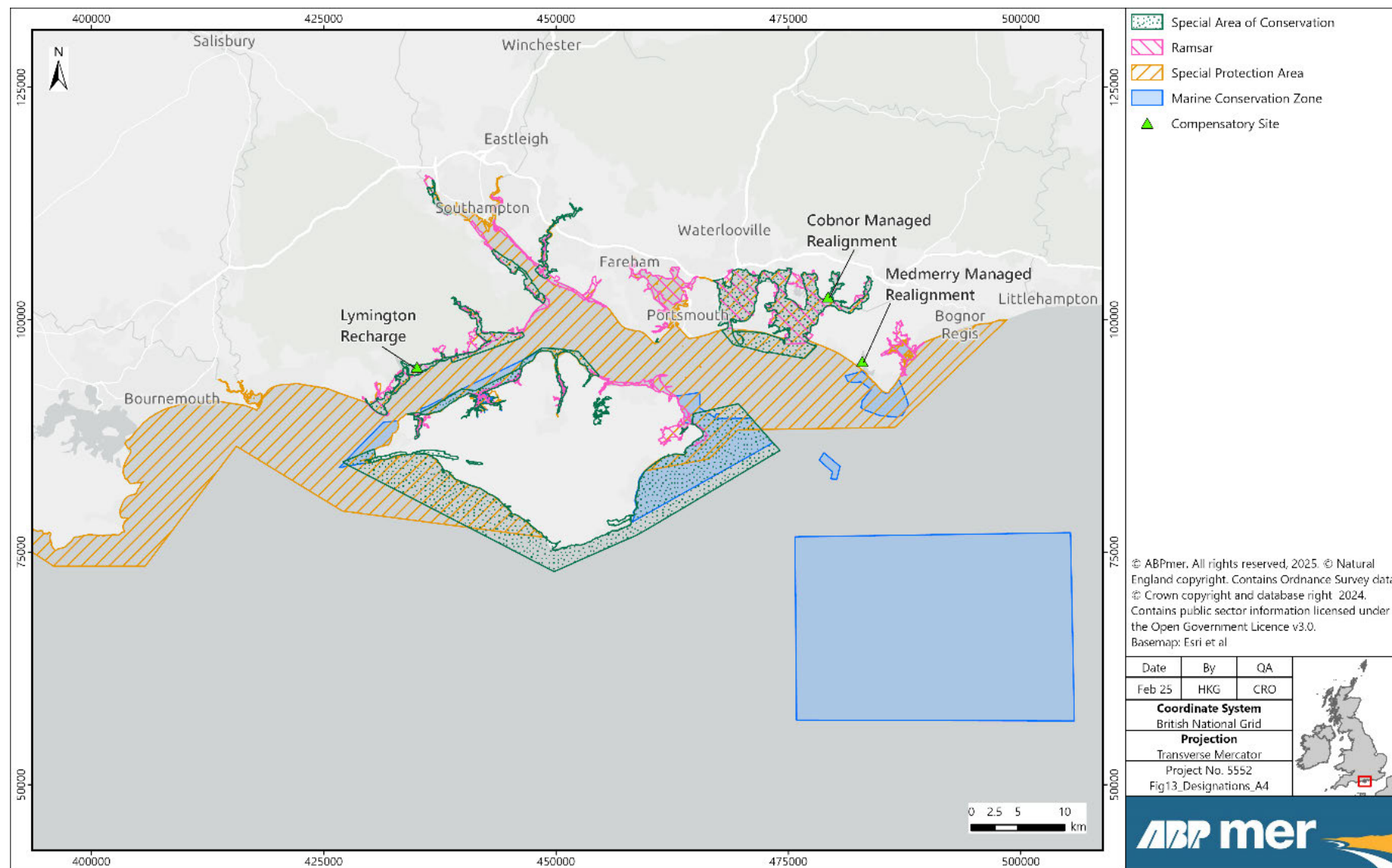


Figure 13. European/Ramsar sites and MCZs in Southampton Water and the Solent

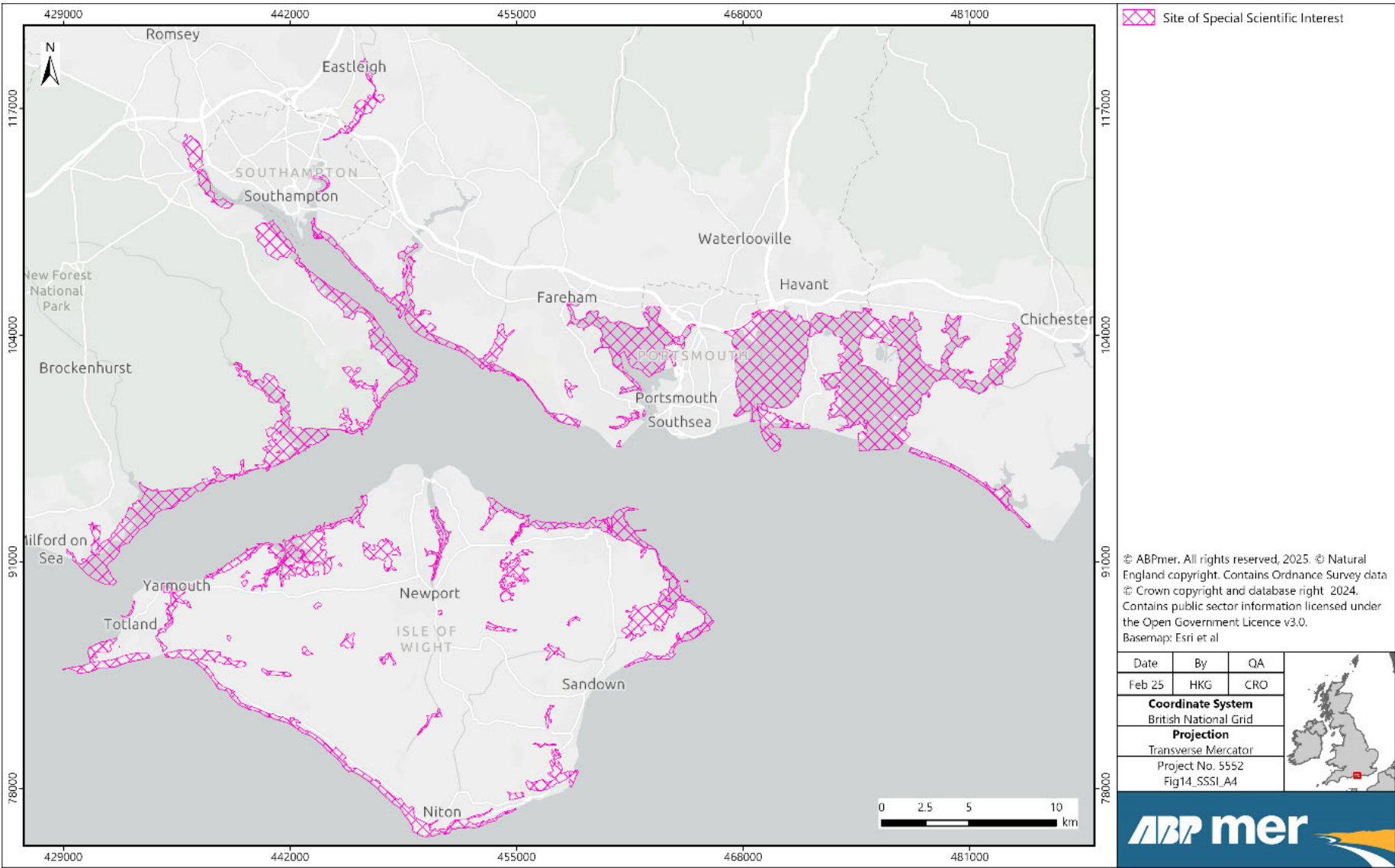


Figure 14. SSSIs in Southampton Water and the Solent

7.1.2 Ramsar Sites

Under the 1971 Ramsar Convention on Wetlands of International Importance, it is a requirement of signatory states to protect wetland sites of international importance, including those that are important waterfowl habitats. An overview of the reasons for designating the Ramsar sites that occur within the study area is included in Table 21. The locations of these sites are shown in Figure 13.

Table 21. Ramsar sites within the study area

Site	Ramsar Qualifying Criteria
Solent and Southampton Water	Criterion 1 The site is one of the few major sheltered channels between a substantial island and mainland in European waters, exhibiting an unusual strong double tidal flow and has long periods of slack water at high and low tide. It includes many wetland habitats characteristic of the biogeographic region: saline Criterion 2 The site supports an important assemblage of rare plants and invertebrates. Criterion 5 Waterfowl assemblages of international importance Criterion 6 Species/populations occurring at levels of international importance
Portsmouth Harbour SPA	Criterion 3 The intertidal mudflat areas possess extensive beds of eelgrass <i>Zostera angustifolia</i> and <i>Zostera noltei</i> which support the grazing dark-bellied brent geese populations. The mud-snail <i>Hydrobia ulvae</i> is found at extremely high densities, which helps to support the wading bird interest of the site. Common cord-grass <i>Spartina anglica</i> dominates large areas of the saltmarsh and there are also extensive areas of green algae <i>Enteromorpha</i> spp. and sea lettuce <i>Ulva lactuca</i>. More locally the saltmarsh is dominated by sea purslane <i>Halimione portulacoides</i> which gradates to more varied communities at the higher shore levels. The site also includes a number of saline lagoons hosting nationally important species. Criterion 6 Species/populations occurring at levels of international importance
Chichester and Langstone Harbours	Criterion 1 Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes. Criterion 5 Waterfowl assemblages of international importance Criterion 6 Species/populations occurring at levels of international importance

Source: JNCC, 2008a, b; c

7.1.3 Special Areas of Conservation

The Habitats Directive (92/43/EEC) requires the establishment of a network of important high quality conservation sites that will make a significant contribution to conserving the 169 habitat types and 623 species identified in Annexes I and II of the Habitats Directive. This legislation has since been transposed into UK legislation by the Habitats Regulations.

An overview of the reasons for designating the SACs that occur within the study area is included in Table 22. The locations of these sites are shown in Figure 13.

Table 22. SACs within the study area

Site	SAC Qualifying Features	
	Annex 1 Habitats	Annex II Species
Solent Maritime	1110 Sandbanks which are slightly covered by sea water all the time ² 1130 Estuaries ¹ 1140 Mudflats and sandflats not covered by seawater at low tide ² 1150 Coastal lagoons ² 1210 Annual vegetation of drift lines ² 1220 Perennial vegetation of stony banks ² 1310 <i>Salicornia</i> and other annuals colonizing mud and sand ² 1320 <i>Spartina</i> swards (<i>Spartinion maritimae</i>) ¹ 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) ¹ 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes") ²	1016 Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>) ²
South Wight Maritime	1170 Reefs ¹ 1230 Vegetated sea cliffs of the Atlantic and Baltic Coasts ¹ 8330 Submerged or partially submerged sea caves ¹	-
River Itchen	3260 Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation ¹	1044 Southern damselfly (<i>Coenagrion mercurial</i>) ¹ 1092 White-clawed (or Atlantic stream) crayfish (<i>Austropotamobius pallipes</i>) ² 1096 Brook lamprey (<i>Lampetra planeri</i>) ² 1106 Atlantic salmon (<i>Salmo salar</i>) ² 1163 Bullhead (<i>Cottus gobio</i>) ¹ 1355 Otter (<i>Lutra lutra</i>) ²
Solent and Isle of Wight Lagoons	1150 Coastal lagoons ¹	
¹ Priority feature ² Present as a qualifying feature, but not a primary reason for selection of this site		

Source: JNCC, 2025a, b, c, d, Natural England, 2020

7.1.4 European Marine Sites

European Marine Sites is the collective term for SACs and SPAs that are covered by tidal water (continuously or intermittently) and protect some of Britain's most special marine and coastal habitats and species of European importance. In accordance with Government advice in both England and Wales, Ramsar sites must be given the same consideration as European sites when considering plans and projects which might affect them (DCLG, 2012). European Marine Sites form part of the MPA network (Natural England, 2014).

The following European Marine Sites and corresponding international designations which are described above are located in the study area:

- Solent European Marine Site, comprising:
 - Solent Maritime SAC;
 - Solent and Isle of Wight Lagoons SAC;
 - Solent and Southampton Water SPA and Ramsar site;
 - Chichester and Langstone Harbours SPA and Ramsar site; and
 - Portsmouth Harbour SPA and Ramsar site.
- South Wight Maritime European Marine Site, comprising:
 - South Wight Maritime SAC.

7.1.5 Compensatory Sites

The December 2024 National Planning Policy Framework (NPPF), which sets out the Government's planning policies for England confirms (in Paragraph 194) that "*sites identified, or required, as compensatory measures for adverse effects on habitat sites*" should be given the same protection as European sites (DCLG, 2024, p56). On this basis, all completed managed realignment or recharge sites that have been created for compensatory purposes were identified. These are shown on Figure 13 and are as follows.

- Cobnor managed realignment;
- Lymington recharge; and
- Medmerry managed realignment.

The interest features of the compensatory sites that occur in the study area are not known, however, it is considered that these will support features already designated by other European/Ramsar sites, in particular coastal habitats and supporting species, and foraging and migratory birds.

7.1.6 Marine Conservation Zones (MCZ)

A summary of the legislative basis for the designation of MCZs is provided in Section 2.3. There are 91 MCZs in waters around England. These were designated in three phases after a process closely involving stakeholders. The first 27 zones were designated on 21 November 2013. Following consultation, 23 sites in the second phase were announced on 17 January 2016, and during a third phase a further 41 sites and 12 additional features were announced on 31 May 2019.

There are a number of MCZs that are located in the study. These are shown on Figure 13 and are as follows.

- Offshore Overfalls MCZ;
- Utopia MCZ;

- Bembridge MCZ;
- Yarmouth to Cowes MCZ;
- The Needles MCZ; and
- Selsey Bill and the Hounds.

7.2 Protected Habitats and Species

The Wildlife and Countryside Act 1981 (as amended) (WCA) protects various animals, plants, habitats in the UK. Relevant protected WCA species recorded in the Solent region include the tentacled lagoon worm, the lagoon sand shrimp, cetacean (whale and dolphin) species and all bird species.

Marine species are also protected from being killed, injured or disturbed both inside and outside designated sites under the provisions of the Habitats Regulations⁴. Of relevance to the Solent region are common seal and grey seal (listed in Annex II and V), bottlenose dolphin and harbour porpoise (listed in Annex II and IV), sea lamprey (listed in Annex II) and river lamprey (listed in Annex II and V), and Atlantic salmon (listed in Annex II and V). All naturally occurring wild bird species, their eggs, nests and habitats are strictly protected under the Habitats Regulations.

Seals are also protected under the Conservation of Seals Act 1970.

In addition, some marine fauna and habitats are listed as priority species and habitats of principle importance in England, as required under Section 41 of the Natural Environment and Rural Communities (NERC) Act. Species of principal importance which are of relevance to the Solent region include various species of waterbirds, commercial fish (such as cod and herring), migratory fish (such as lampreys, Atlantic salmon and European eel).

Habitats of principle importance which are of relevance to the Solent region include intertidal mudflats, coastal saltmarsh and saline lagoons. Based on the current geographic extent and location of habitats of principal importance under Section 41 of the NERC Act 2006 that are publicly available on the MAGiC website (Natural England, 2025b).

European eels are also afforded protection as part of the Eels (England and Wales) Regulations 2009. The regulations which apply to all freshwater and estuarine waters of England and Wales give powers to statutory bodies to implement measures for the recovery of European eel stocks including improving access, habitat quality and easing fishing pressure.

7.3 MPA conservation advice

Natural England has a statutory responsibility to advise relevant authorities as to the conservation objectives for all MPAs within English territorial waters, as well as operations which may cause deterioration or disturbance of natural habitats and species. MPA designations include SACs, SPAs, Ramsar Sites and MCZs.

Natural England undertook an MPA conservation advice project to provide conservation advice that is clear, easily understood and meets the needs of the organisations and individuals that use it. Conservation advice packages for all SPAs and SACs within the study area have been produced (Natural England, 2018a, b, 2019, 2020, 2021a). At the time of writing this report, conservation advice packages for all MCZs are available (Natural England, 2021b, 2023a, b, 2024a, b) other than Offshore Overfalls MCZ.

⁴ These have been modified by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

The role of the conservation objectives is to define the nature conservation aspirations for the features of interest. The following sections summarise the relevant favourable condition attributes for which targets have been set for each of the relevant sub-features.

7.3.1 SPA sub-features

The Regulation 37 advice for the Solent European Marine Site (formerly Regulation 35) recognises that bird populations' change, therefore the advice focuses on the condition of the habitat to support birds rather than the bird numbers themselves. In this respect the ecologically important sub-features associated with the bird features have been identified (Table 20). The maintenance of the favourable condition of these habitats is considered fundamental in the maintenance of the European/Ramsar sites.

The conservation objective for the relevant sub-features that have been identified within the SPAs of the Solent European Marine Site (see Section 7.1.1) is to maintain the sub-features (habitats) in favourable condition. Details of how to recognise favourable condition is summarised in the respective Regulation 37 Advice (English Nature, 2001a; Natural England, 2015). The favourable condition attributes for which targets have been set for each of the relevant sub-features can be summarised as follows:

- Sand and shingle - extent and distribution of habitat, vegetation characteristics;
- Saltmarsh - extent and distribution of habitat, vegetation characteristics, food availability;
- Intertidal mudflats and sandflats - extent and distribution of habitat, food availability;
- Shallow coastal waters – food availability;
- Boulder and cobble shores - extent and distribution of habitat, food availability;
- Mixed sediment shores - extent and distribution of habitat, food availability; and
- Shingle - extent and distribution of habitat.

Birds can also be affected by disturbance, particularly changes in noise, movement and lines of sight so the Habitats Regulations requires measures to avoid such forms of significant disturbance.

7.3.2 Ramsar sub-features

The Regulation 37 advice focuses on the condition of the habitats that support the interest features as opposed to the features themselves. The conservation objectives for the sub-features identified within the Ramsar sites comprising the Solent European Marine Site therefore relate to the supporting habitats. The favourable condition attributes for which targets have been set for each of the relevant sub-features can be summarised as follows:

- Estuaries – extent, morphological equilibrium, water density – temperature and salinity, nutrient status;
- Saline lagoons – extent, salinity, water depth, isolating barrier – presence and nature, species composition, water clarity;
- Saltmarsh – extent and distribution of habitat, vegetation characteristics, food availability;
- Intertidal reefs – extent, water temperature and salinity, water clarity, characteristic species;
- Cordgrass swards – distribution and extent;
- Intertidal mudflats and sandflats - extent and distribution of habitat, food availability;
- Boulder and cobble shores - extent and distribution of habitat, food availability;
- Mixed sediment shores - extent and distribution of habitat, food availability;
- Sand and shingle - extent and distribution of habitat, vegetation characteristics; and
- Shallow coastal waters – food availability.

7.3.3 SAC sub-features

The conservation objectives for the SAC interest features of the Solent and South Wight Maritime European Marine Sites are to maintain each in favourable condition subject to natural change. Details of how to recognise favourable condition is summarised in the respective Regulation 37 Advice (English Nature, 2001a; 2001b; Natural England, 2016).

The favourable condition attributes for which targets have been set for each of the SAC interest features of the Solent and South Wight Maritime European Marine Sites are summarised as follows:

- Estuary – extent, morphological equilibrium, water density – temperature and salinity, nutrient status;
- Annual vegetation of drift lines – extent, mobility, coastal processes, substrate composition, characteristic species of annual vegetation of drift lines;
- Atlantic salt meadows – distribution and extent, species composition;
- *Salicornia* and other annuals colonising mud and sand – algal mat cover, distribution and extent of common cordgrass *Spartina anglica* community;
- Cordgrass swards – distribution and extent of small, smooth and Townsend's cordgrass communities;
- Intertidal mudflats and sandflats – extent, topography, nutrient enrichment – macroalgal mats, sediment character, range and distribution of characteristic mud biotopes (e.g. LMU), sand and gravel biotopes (e.g. LMS), mixed sediment biotopes (e.g. LMX), extent of eelgrass beds;
- Sandbanks which are slightly covered by seawater all the time – extent, sediment character, topography, range and distribution of characteristic subtidal muddy sand biotopes (e.g. IMU), gravelly sand and sand biotopes, extent of eelgrass beds; and
- Reefs – extent, absence of coastal defence, water temperature and salinity, water clarity, range and distribution of characteristic sea cave biotope complexes, rock shore communities, kelp forest communities, subtidal red algae communities, subtidal faunal turf communities, species composition of characteristic biotopes.

The River Itchen SAC does not form part of a European Marine Site and therefore there is no Natural England advice under Regulation 35 of the favourable condition targets or conservation objectives for the qualifying interest features of this site. It is assumed that the objectives of the site will be to maintain the features in favourable condition.

7.3.4 Favourable condition status

Favourable condition status has not yet been defined specifically for the European/Ramsar sites in the study area, however, a condition assessment of the respective Sites of Special Scientific Interest (SSSIs) which cover virtually the same geographic extent as the European/Ramsar sites that occur in the study area has been undertaken by Natural England (Natural England, 2025a).

Advice on Operations has also been prepared by Natural England for MPAs to identify pressures associated with the most commonly occurring marine activities to designated features and subfeatures, including the potential impact of maintenance dredging and disposal activities. It provides a detailed assessment of sensitivity for each feature/sub-feature or supporting habitat to these pressures. Conservation objectives, latest condition assessment and the assessment of marine activities, pressures and any supporting evidence can be found on Natural England's Designated Sites Viewer (Natural England, 2025c).

A summary of the favourable condition status of the SSSIs within the study area are presented in Table 23.

Table 23. Favourable condition status of SSSIs

SSSI	% Area Meeting PSA Target ⁵	% Area Favourable	% Area Unfavourable Recovering	% Area Unfavourable No Change	% Area Unfavourable Declining	% Area Destroyed/ Part Destroyed	% Area Not Recorded
Bembridge Down	100.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bembridge School and Cliffs	0.00%	0.00%	0.00%	100%	0.00%	0.00%	0.00%
Bonchurch Landslips	100.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bouldnor and Hamstead Cliffs	100%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Bracklesham Bay	92.30%	46.15%	46.15%	0.00%	7.69%	0.00%	0.00%
Brading Marshes to St Helen's Ledges	47.37%	42.11%	5.26%	15.79%	21.05%	0.00%	15.79%
Chichester Harbour	65.39%	30.77%	34.62%	3.85%	19.23%	0.00%	11.54%
Compton Chine to Steeplehill Cove	88.24%	17.65%	70.59%	0.00%	5.88%	0.00%	5.88%
Compton Down	42.86%	14.29%	28.57%	0.00%	0.00%	0.00%	57.14%
Dibden Bay	0.00%	0.00%	0.00%	100%	0.00%	0.00%	0.00%
Eling and Bury Marshes	42.86%	14.29%	28.57%	0.00%	0.00%	0.00%	57.14%
Gilkicker Lagoon	50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	50.00%
Headon Warren and West High Down	41.67%	41.67%	0.00%	0.00%	0.00%	8.33%	50.00%
Hurst Castle and Lymington River Estuary	14.29%	14.29%	0.00%	0.00%	0.00%	0.00%	85.71%
Hythe to Calshot Marshes	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%

⁵ The Government's Public Service Agreement (PSA) target to have 95% of the SSSI area in favourable or recovering condition.
<https://publications.parliament.uk/pa/cm200304/cmselect/cmenvfru/475/47504.htm>

SSSI	% Area Meeting PSA Target5	% Area Favourable	% Area Unfavourable Recovering	% Area Unfavourable No Change	% Area Unfavourable Declining	% Area Destroyed/ Part Destroyed	% Area Not Recorded
King's Quay Shore	50.00%	50.00%	0.00%	0.00%	0.00%	0.00%	50.00%
Langstone Harbour	91.30%	91.30%	0.00%	0.00%	0.00%	0.00%	8.70%
Lee-on-the Solent To Itchen Estuary	23.67%	7.69%	15.98%	15.38%	0.00%	0.00%	76.92%
Lincegrove and Hackett's Marshes	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
Lower Test Valley	50.00%	33.33%	16.67%	0.00%	0.00%	0.00%	50.00%
Medina Estuary	43.75%	43.75%	0.00%	0.00%	0.00%	0.00%	56.25%
Newtown Harbour	26.67%	26.67%	0.00%	0.00%	0.00%	0.00%	73.33
North Solent	41.94%	32.26%	9.68%	3.23%	16.13%	0.00%	38.71%
Portsmouth Harbour	63.64%	0.00%	63.64%	27.27%	0.00%	0.00%	0.00%
River Itchen	100.00%	100.00%	0.00%	20.00%	0.00%	0.00%	0.00%
River Test	0.00%	0.00%	0.00%	15.38%	0.00%	0.00%	84.62%
Ryde Sands and Wootton Creek	0.00%	0.00%	0.00%	33.33%	0.00%	0.00%	66.67%
Sinah Common	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
Sowley Pond	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
Titchfield Haven	50.00%	50.00%	0.00%	0.00%	50.00%	0.00%	0.00%
Thorness Bay	84.00%	84.00%	0.00%	0.00%	16.00%	0.00%	0.00%
Warblington Meadow	50.00%	50.00%	0.00%	50.00%	0.00%	0.00%	0.00%
Whitecliff Bay and Bembridge Ledges	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	40%
Yar Estuary	57.14%	57.14%	0.00%	0.00%	0.00%	0.00%	42.86%

Source: Natural England, 2025a

The majority of SSSI units (over 50%) are described as being in favourable condition. The main habitats in the units which were not considered to be meeting Public Service Agreement (PSA) targets include littoral sediment, supralittoral sediment, neutral grassland-lowland, broadleaved mixed and yew woodland-lowland, fen, marsh and swamp- lowland. Typical reasons for this classification included coastal squeeze, inappropriate habitat management, encroachment of vehicles, insufficient and inappropriate water level control (by tidal sluice), a lack of grazing or cutting management, build-up of litter, overshadowing of river banks and fen vegetation, and scrub encroachment.

7.3.5 Marine Conservation Zones

The features and conservation objectives for each of the MCZs in the study area are included in Table 24. The conservation objective "maintain" means that in general the current levels of activity in the area are considered acceptable, but they will be monitored and restrictions may have to be introduced if the condition declines. "Recover" means that restrictions on certain activities causing the pressure may be necessary to allow the feature to recover to favourable condition. It does not necessarily mean that an activity will be prohibited, as other mitigation measures might be appropriate (e.g. change in fishing gear type, reduction in intensity, seasonal restrictions etc.).

Table 24. Features and conservation objectives for designated MCZs within the study area

MCZ	Feature Type	Feature Name	Conservation Objectives
Offshore Overfalls MCZ	Broad-scale habitat	A5.1 Subtidal coarse sediments	Recover
		A5.2 Subtidal sand	Recover
		A5.4 Subtidal mixed sediments	Recover
	Geomorphological Feature	English Channel outburst flood features	Maintain
Utopia MCZ	Habitat Features of Conservation Importance (FOCI)	Fragile sponge and anthozoan communities	Recover
Bembridge MCZ	Broad-scale habitat	A5.2 Subtidal sand	Maintain
		A5.3 Subtidal mud	Maintain
		A5.4 Subtidal mixed sediments	Maintain
	Habitat FOCI	Maerl beds	Recover
		Mud habitats in deep water	Maintain
		Rossworm (<i>Sabellaria spinulosa</i>) reef	Recover
		Seagrass beds	Recover
		Native oyster (<i>Ostrea edulis</i>) beds	Recover
		Sea-pen and burrowing megafauna communities	Recover
	Species FOCI Low mobility	Tentacled lagoon worm (<i>Alkmaria romijni</i>)	Maintain
		Lagoon sand shrimp (<i>Gammarus insensibilis</i>)	Maintain
		Kaleidoscope stalked jellyfish (<i>Haliclystus auricula</i>)	Maintain
		Long-snouted seahorse (<i>Hippocampus guttulatus</i>)	Maintain
		Short-snouted seahorse (<i>Hippocampus hippocampus</i>)	Maintain

MCZ	Feature Type	Feature Name	Conservation Objectives
		Starlet sea anemone (<i>Nematostella vectensis</i>)	Maintain
		Native oyster (<i>O. edulis</i>)	Recover
		Peacock's tail (<i>Padina pavonica</i>)	Maintain
		Sea snail (<i>Paludinella littorina</i>)	Maintain
Yarmouth to Cowes MCZ	Broad-scale habitats	A2.1 Intertidal coarse sediment	To be assessed
		A1.3 Low energy intertidal rock	Maintain
		A3.2 Moderate energy infralittoral rock	Maintain / Recover
		A5.1 subtidal coarse sediment	Maintain
	Habitat FOCI	Estuarine rocky habitats	Recover
		Intertidal underboulder communities	Recover
		Native oyster beds	Maintain
		Peat and clay exposures	Recover
		Rossworm (<i>Sabellaria spinulosa</i>) reef	Recover
		Seagrass beds	Recover
	Species FOCI Low mobility	Lagoon Sand Shrimp (<i>Gammarus insensibilis</i>)	Maintain
		Native Oyster (<i>Ostrea edulis</i>)	Maintain
The Needles MCZ	Broad-scale habitats	Moderate energy infralittoral rock	Maintain
		High energy infralittoral rock	Maintain
		Moderate energy circalittoral rock	Maintain
		Subtidal chalk	Recover
		Subtidal coarse sediment	Recover
		Subtidal mixed sediments	Recover
		Subtidal sand	Recover
		Subtidal mud	Recover
		Sheltered muddy gravels	Recover
	Habitat FOCI	Seagrass Beds	Recover
	Species FOCI Low mobility	Stalked jellyfish (<i>Lucernariopsis campanulata</i>)	Maintain
		Peacock's tail (<i>Padina pavonica</i>)	Recover
		Native oyster (<i>Ostrea edulis</i>)	Recover
Selsey Bill and the Hounds MCZ	Broad-scale habitats	Bracklesham Bay geological feature	Maintain
		Subtidal mixed sediments	Maintain
		Subtidal sand	Maintain
		High energy infralittoral rock	Recover
		Low energy infralittoral rock	Recover
		Moderate energy infralittoral rock	Recover
		Moderate energy circalittoral rock	Recover
	Habitat FOCI	Peat and clay exposures	Recover
	Species FOCI Low mobility	Short-snouted seahorse (<i>Hippocampus hippocampus</i>)	Maintain

Source: Defra, 2013; JNCC, 2016

7.4 Water Framework Directive baseline information

The WFD (2000/60/EC) came into force in 2000 and established a framework for the management and protection of Europe's water resources. It is implemented in England and Wales through the Water Environment (WFD) (England and Wales) Regulations 2017 (the Water Framework Regulations) (as amended). The overall objective of the WFD is to achieve good status (GS) in all inland, transitional, coastal and ground waters by 2021, unless alternative objectives are set and there are appropriate reasons for time limited derogation. While the UK left the EU on 31 January 2020, the UK continues to be committed to meeting high environmental standards. The main provisions of the WFD have been retained in English law through the Floods and Water (Amendment etc.) (EU Exit) Regulations 2019.

The WFD divides rivers, lakes, lagoons, estuaries, coastal waters (out to one nautical mile from the low water mark), man-made docks and canals into a series of discrete surface water bodies. It sets ecological as well as chemical targets (objectives) for each surface water body. For a surface water body to be at overall GS, the water body must be achieving good ecological status (GES) and good chemical status (GCS). Ecological status is measured on a scale of high, good, moderate, poor or bad, while chemical status is measured as good or fail (i.e. failing to achieve good) (Environment Agency, 2022a).

Each surface water body has a hydromorphological designation that describes how modified a water body is from its natural state. Water bodies are either undesignated (i.e. natural, unchanged), designated as a heavily modified water body (HMWB) or designated as an artificial water body (AWB). HMWBs are defined as bodies of water which, as a result of physical alteration by sustainable human use activities (such as flood protection and navigation) are substantially changed in character and cannot, therefore, meet GES. AWBs are artificially created through human activity. The default target for HMWBs and AWBs under the WFD is to achieve good ecological potential (GEP), a status recognising the importance of their human use while ensuring ecology is protected as far as possible.

The ecological status of surface waters is classified using information on the biological (e.g. fish, benthic invertebrates, phytoplankton, angiosperms and macroalgae), physico-chemical (e.g. dissolved oxygen (DO) and salinity) and hydromorphological (e.g. hydrological regime) quality of the body of water, as well as several specific pollutants (e.g. copper and zinc). Compliance with chemical status objectives is assessed in relation to environmental quality standards (EQS) for a specified list of 'priority' and 'priority hazardous' substances. These substances were first established by the Priority Substances Directive (PSD) (2008/105/EC) which entered into force in 2009. The PSD sets objectives, amongst other things, for the reduction of these substances through the cessation of discharges or emissions.

As required by the WFD and PSD, a proposal to revise the list of priority (hazardous) substances was submitted in 2012. Subsequently, an updated PSD (2013/39/EU) was published in 2013, identifying new priority substances, setting EQSs for those newly identified substances, revising the EQS for some existing substances in line with scientific progress and setting biota EQSs for some existing and newly identified priority substances. The updated PSD is transposed into UK legislation through the Water Environment (WFD) (England and Wales) (Amendment) Regulations 2015, which entered into force in September 2015, and explained in the WFD (Standards and Classification) Directions (England and Wales) 2015.

In addition to surface water bodies, the WFD also incorporates groundwater water bodies. Groundwaters are assessed against different criteria compared to surface water bodies since they do not support ecological communities (i.e. it is not appropriate to consider the ecological status of a groundwater). Therefore, groundwater water bodies are classified as good or poor quantitative status in terms of their quantity (groundwater levels and flow directions) and quality (pollutant concentrations and conductivity), along with chemical (groundwater) status.

River Basin Management Plans (RBMPs) are a requirement of the WFD, setting out measures for each river basin district to maintain and improve quality in surface and groundwater water bodies where necessary. In 2009, the Environment Agency published the first cycle (2009 to 2015) of RBMPs for England and Wales, reporting the status and objectives of each individual water body (Environment Agency, 2009). The Environment Agency subsequently published updated RBMPs for England as part of the second cycle (2015 to 2021) (Environment Agency, 2015), as well as providing water body classification results from 2015 via the Environment Agency Catchment Data Explorer (<http://environment.data.gov.uk/catchment-planning>) (Environment Agency, 2025). The latest updates to RBMPs took place in January 2024, and this third stage of the RBMP approach to water body management covers the period from 2022 to 2027.

The maintenance dredging and disposal activities within Southampton SHA are located within the South East River Basin District which is reported in the South East river basin district RBMP (Environment Agency, 2022b).

Consideration of WFD requirements is necessary for works which have the potential to cause deterioration in ecological, quantitative and/or chemical status of a water body or to compromise improvements which might otherwise lead to a water body meeting its WFD objectives. Therefore, it is necessary to consider the potential for the routine maintenance activities to impact WFD water bodies, specifically referring to the following environmental objectives, as set out in Section 13 (Subsections 1 to 7) of the Water Framework Regulations:

- **For surface water bodies**, the objectives are to:
 - (a) Prevent deterioration of the status of each body of surface water;
 - (b) Protect, enhance and restore each body of surface water (other than an artificial or heavily modified water body) with the aim of achieving good ecological status and (...) good surface water chemical status, if not already achieved (...);
 - (c) Protect and enhance each artificial or heavily modified water body with the aim of achieving good ecological potential and (...) good surface water chemical status, if not already achieved (...); and
 - (d) Aim progressively to reduce pollution from priority substances and aim to cease or phase out emissions, discharges and losses of priority hazardous substances.
- **For shellfish water protected areas**, in addition to the [above] objectives (...) for the surface water bodies in which they are located, the objectives are such objectives as are necessary or desirable to improve or protect the shellfish water protected area in order to support shellfish life and growth and to contribute to the high quality of shellfish products suitable for human consumption as the appropriate authority may direct.
- **For groundwater bodies**, the objectives are to:
 - (a) Prevent deterioration of the status of each body of groundwater;
 - (b) Prevent or limit the input of pollutants into groundwater;
 - (c) Protect, enhance and restore each body of groundwater, and ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater chemical status and good groundwater quantitative status, if not already achieved (...); and
 - (d) Reverse any significant and sustained upward trend in the concentration of any pollutant resulting from the impact of human activity in order to progressively reduce pollution of groundwater.

- **For each protected area**, other than a shellfish water protected area, the objective is to achieve compliance with any standards and objectives required by or under [the retained EU law] under which the area or body is protected:
 - (a) By 22 December 2021, if not already achieved, or
 - (b) If different, by any date for compliance set in [the relevant retained EU law].

Where two or more objectives set under this regulation apply to the same body of water, or the same part of a body of water, the most stringent objective applies.

7.4.1 Water bodies in the study area

Within the study area, a number of water bodies have the potential for a hydromorphological link with maintenance dredging and/or disposal activities. These include two coastal, three transitional and 42 fluvial water bodies. Information on the water bodies are summarised in Table 25 and Table 26. The location of these water bodies are shown in Figure 15.

Many of the fluvial water bodies with a potential for a hydromorphological link can be screened out due to the location of the Natural Tidal Limit (NTL), or the presence of weirs, sluice or tide, which limits tidal exchange. There is only one fluvial water body, where there is still the potential for tidal exchange between the transitional and fluvial water bodies, and therefore, a hydromorphological link with dredging activities, which is the River Test (lower) (Table 26). These fluvial water bodies are not discussed further.

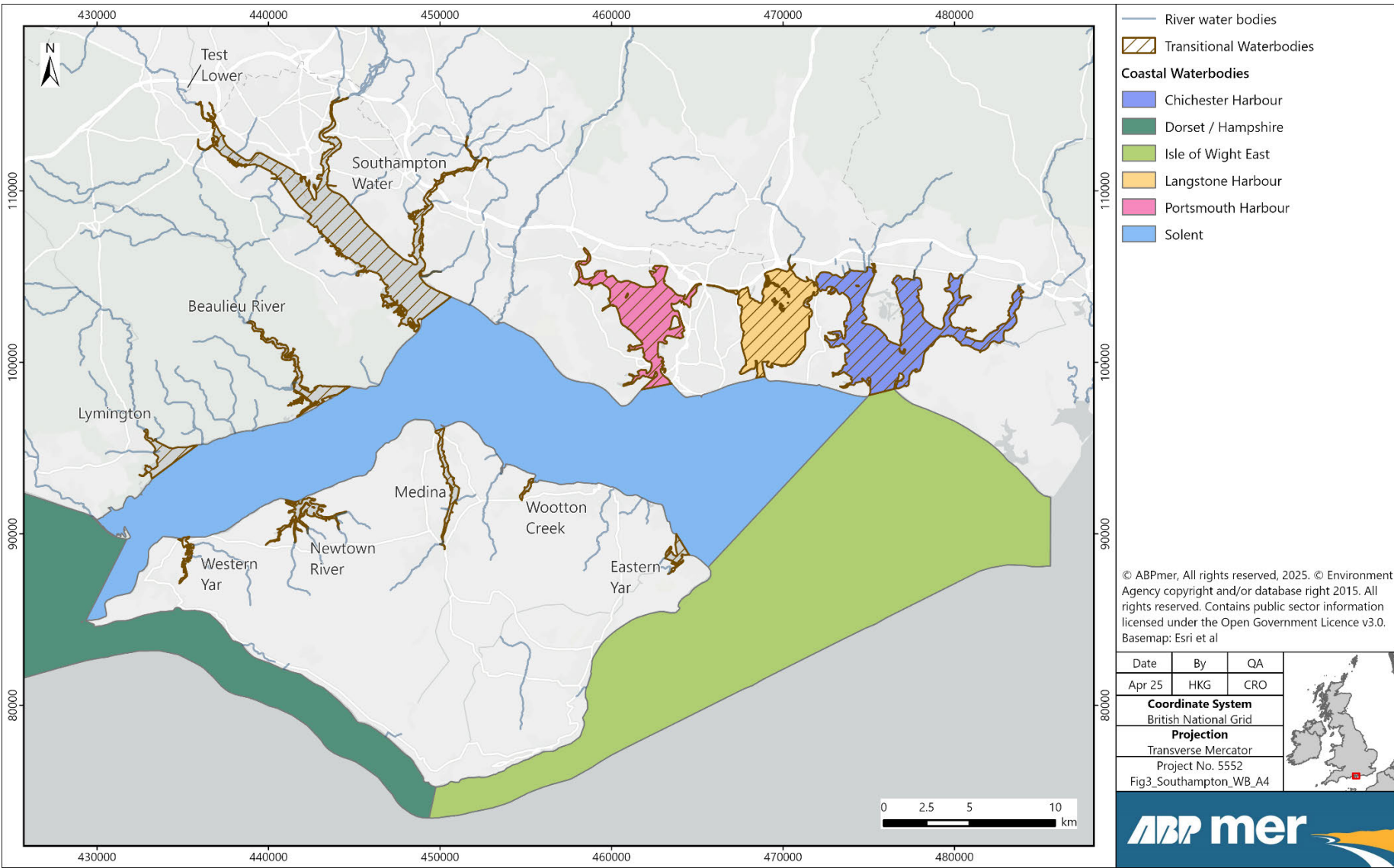


Figure 15. Location of WFD water bodies in the study area

Table 25. Coastal and transitional water bodies within 5 km of maintenance dredging and/or disposal activities

Water Body Name	Map Code	Water Body Reference	Water Body Type	Hydromorphological Designation
Solent	C4	GB650705150000	Coastal	HMWB
Isle of Wight East	C5	GB650705530000	Coastal	HMWB
Beaulieu River	T2	GB520704201400	Transitional	HMWB
Medina	T4	GB520710101600	Transitional	HMWB
Southampton Water	T17	GB520704202800	Transitional	HMWB
HMWB Heavily Modified Water Body; AWB Artificial Water Body				

Table 26. Fluvial water bodies within 5 km of maintenance dredging and/or disposal activities

Catchment	Map Code	Water Body Reference	Water Body Name	Scoping Relevance (Reason)	Hydromorphological Designation
New Forest	R4	GB107042011200	River Beaulieu	Out (Weir)	HMWB
	R10	GB107042011290	Stone Farm Stream	Out (NTL/Piping)	None
	R11	GB107042011310	Mopley Pond Stream	Out (NTL/Piping)	None
	R13	GB107042011330	Dark Water	Out (Piping)	HMWB
	R14	GB107042011340	Cadland Stream	Out (NTL/Piping)	None
	R15	GB107042011350	Langdown Stream	Out (NTL/Piping)	HMWB
	R18	GB107042016690	Marchwood Park Stream Tributary	Out (NTL/Piping)	HMWB
	R21	GB107042016730	Bartley Water	Out (Weir)	HMWB
	R29	GB107042011210	Beaulieu Abbey Stream	Out (NTL/Piping)	None
	R22	GB107042016740	Jacobs Gutter	Out (NTL/Piping)	None
	R30	GB107042016700	Magazine Lane Stream	Out (NTL/Piping)	HMWB
East Hampshire	R1	GB107042011920	Hamble	Out (Sluice)	None
	R13	GB107042011240	Bromwich Stream	Out (NTL/Piping)	None
	R14	GB107042011250	Hook Lake	Out (NTL/Piping)	HMWB
	R15	GB107042011370	River Alver	Out (NTL/Piping)	None
	R16	GB107042016500	Hamble	Out (Sluice)	None
	R17	GB107042016520	Hamble	Out (NTL/Piping)	HMWB

Catchment	Map Code	Water Body Reference	Water Body Name	Scoping Relevance (Reason)	Hydromorphological Designation
	R21	GB107042016640	River Meon	Out (Tide gates)	None
	R22	GB107042016830	Hamble	Out (NTL/Piping)	HMWB
Isle of Wight	R9	GB107101006100	Blackbridge Brook	Out (Weir)	HMWB
	R10	GB107101006120	Monktonmead Brook	Out (NTL/Piping)	HMWB
	R11	GB107101006190	Palmers Brook	Out (NTL/Piping)	None
	R16	GB107101006240	Gunard Luck	Out (NTL/Piping)	None
	R25	GB107101006110	Dodnor Creek	Out (NTL/Piping)	None
	R26	GB107101006130	Binstead Stream	Out (NTL/Piping)	HMWB
	R27	GB107101006140	Quarr Stream	Out (NTL/Piping)	HMWB
	R28	GB107101006160	Alverstone Stream (Medina)	Out (Lock gates)	HMWB
	R29	GB107101006170	Great Thorness Stream	Out (NTL/Piping)	HMWB
	R30	GB107101006180	Little Thorness Stream	Out (Weir/Sluice)	None
	R31	GB107101006200	Barton Manor Stream	Out (NTL/Piping)	None
Test and Itchen	R1	GB107042022580	River Itchen	Out (Weir/Sluice)	HMWB
	R5	GB107042016310	Monks Brook	Out (Weir/Sluice)	HMWB
	R7	GB107042016380	Cadnam River	Out (NTL/Piping)	None
	R8	GB107042016430	Tadburn Lake	Out (NTL/Piping)	None
	R12	GB107042016530	Butlocks Heath Stream	Out (NTL/Piping)	None
	R13	GB107042016550	Westwood Stream	Out (NTL/Piping)	None
	R28	GB107042016620	Tanner's Brook	Out (NTL/Piping)	HMWB
	R32	GB107042016800	Luzborough Lane Stream	Out (NTL/Piping)	None
	R34	GB107042016840	Test (Lower)	In	None
	R43	GB107042016220	Sholing Common Streams	Out (NTL/Piping)	HMWB
	R44	GB107042016230	Highfield Stream	Out (NTL/Piping)	HMWB
	R51	GB107042016790	River Blackwater	Out (NTL/Piping)	None
HMWB Heavily Modified Water Body; NTL Natural Tidal Limit					

7.4.2 Current status of water bodies

Table 27 provides a summary of water body status (based on 2019 cycle 3 classifications) for the relevant water bodies in the study area (see Section 7.4.1). The current ecological potential for the Solent and Isle of Wight East coastal water bodies are 'moderate' and 'good' respectively. All the transitional water bodies, namely Southampton Water, Beaulieu River and the Medina, are all 'moderate'. The current ecological status for the Test (Lower) fluvial water body is 'good'. The chemical status of all the water bodies is a 'fail'. Further information regarding the status of all relevant water bodies in the study area, together with their objectives and relevant protected area information, can be found in the Catchment Data Explorer (Environment Agency, 2025).

Table 27. WFD water body summary table

Water Body Name	Solent	Isle of Wight East	Southampton Water	Beaulieu River	Medina	Test (Lower)
Water Body ID	GB650705150000	GB650705530000	GB520704202800	GB520704201400	GB520710101600	GB107042016840
Water Body Type	Coastal	Coastal	Transitional	Transitional	Transitional	River
Water Body Area/Length	259.581 km ²	263.697 km ²	30.913 km ²	3.075 km ²	1.627 km ²	8.579 km
Hydromorphological Designation (Reasons for Designation)	HMWB (coastal protection, flood protection, navigation, ports and harbours)	HMWB (coastal protection, flood protection)	HMWB (coastal protection, flood protection, navigation, ports and harbours)	HMWB (coastal protection, flood protection)	HMWB (navigation, ports and harbours))	Not designated HMWB/AWB
Protected Area Designations	Bathing Water Directive, Conservation of Wild Birds Directive (SPA), Habitats and Species Directive (SAC), Shellfish Water Directive, Nitrates Directive (NVZ), Urban Waste Water Treatment Directive	Bathing Water Directive, Conservation of Wild Birds Directive (SPA), Habitats and Species Directive (SAC), Shellfish Water Directive, Nitrates Directive (NVZ), Urban Waste Water Treatment Directive	Conservation of Wild Birds Directive (SPA), Habitats and Species Directive (SAC), Shellfish Water Directive, Nitrates Directive (NVZ), Urban Waste Water Treatment Directive	Conservation of Wild Birds Directive (SPA), Habitats and Species Directive (SAC), Shellfish Water Directive	Conservation of Wild Birds Directive (SPA), Habitats and Species Directive (SAC), Shellfish Water Directive, Nitrates Directive (NVZ), Urban Waste Water Treatment Directive	Conservation of Wild Birds Directive (SPA), Shellfish Water Directive, Nitrates Directive (NVZ), Urban Waste Water Treatment Directive, Drinking Water Directive
Overall Status	Moderate	Moderate	Moderate	Moderate	Moderate	Good
Ecological Status/Potential	Moderate	Good	Moderate	Moderate	Moderate	Good
Hydromorphology status	Not assessed	Not assessed	Supports Good	Not assessed	Supports Good	Supports Good
Chemical Status	Fail	Fail	Fail	Fail	Fail	Fail
Parameters Not At Good Status	Dissolved Inorganic Nitrogen (moderate), Polybrominated diphenyl ethers (PBDE), Benzo(ghi)perylene, Mercury and its compounds'	Polybrominated diphenyl ethers (PBDE) (fail); Mercury and Its Compounds (fail).	Dissolved Inorganic Nitrogen (moderate), Mitigation Measures Assessment, Polybrominated diphenyl ethers (PBDE), Benzo(ghi)perylene, Mercury and its compounds'	Polybrominated diphenyl ethers (PBDE) (fail); Mercury and Its Compounds (fail).	Macroalgae (Moderate); Invertebrates (Moderate); Dissolved Inorganic Nitrogen (moderate); Hydrological regime (does not support good); Polybrominated diphenyl ethers (PBDE) (fail); Mercury and Its Compounds (fail).	Polybrominated diphenyl ethers (PBDE) (fail); Benzo(g-h-i) perylene (fail); Mercury and Its Compounds (fail).

Water Body Name	Solent	Isle of Wight East	Southampton Water	Beaulieu River	Medina	Test (Lower)
Higher Sensitivity Habitats	Chalk reef (3,308.84 ha) Intertidal seagrass (141.34 ha) Mussel beds, including blue and horse mussel (0.80 ha) Saltmarsh (132.87 ha) Subtidal kelp beds (111.65 ha) Subtidal seagrass (186.05 ha)	Chalk reef (8847.33 ha) Intertidal seagrass (0.81 ha) Maerl (22.63 ha) Mussel beds, including blue and horse mussel (557.87 ha) Subtidal seagrass (42.66 ha)	Clam, cockle and oyster beds (1.28 ha) Saltmarsh (275.04 ha)	Saltmarsh (111.62 ha).	Chalk reef (4.23 ha) Saltmarsh (12.57 ha)	N/A
Lower Sensitivity Habitats	Cobbles, gravel and shingle (129.48 ha) Intertidal soft sediment (1,496.88 ha) Rocky shore (80.05 ha) Subtidal rocky reef (460.77 ha) Subtidal soft sediments (11,772.25 ha)	Cobbles, gravel and shingle (822.08 ha) Intertidal soft sediment (206.07 ha) Rocky shore (75.75 ha) Subtidal rocky reef (10304.64 ha) Subtidal soft sediments (5344.56 ha).	Cobbles, gravel and shingle (0.46 ha) Intertidal soft sediment (1125.93 ha) Rocky shore (4.65 ha) Subtidal soft sediments (132.77 ha)	Intertidal soft sediments (164.99 ha) Rocky shore (0.05 ha) Subtidal soft sediments (125.92 ha).	Intertidal soft sediment (110.32 ha) Rocky shore (0.56 ha) Subtidal rocky reef (4.23 ha) Subtidal soft sediments (81.93 ha).	N/A
Phytoplankton Status	Good	High	Good	High	High	N/A
History of Harmful Algae	Yes	Not monitored	Yes	No	Not monitored	N/A

Environment Agency (2025)

7.4.3 Water quality – Bathing Waters Directive

The Bathing Water Regulations 2013⁶ (as amended) set out the classification categories for Bathing Waters as excellent, good, sufficient or poor according to the levels of certain types of bacteria (intestinal enterococci and *Escherichia coli*) in samples obtained during the bathing season (May to September). The UK Government's target under the revised Bathing Water Directive (2006/7/EC) is to achieve 'sufficient' for all Bathing Waters. .

There are nine designated Bathing Waters with the potential for a hydromorphological link with maintenance dredging and/or disposal activities (see Figure 16). The sites and their water quality classifications for the preceding five period to 2024 are listed in Table 28. Under the current standards and classification, the eight Bathing Waters achieve an 'excellent' or 'good' status.

Table 28. Bathing Waters classifications in study area

Bathing Water	2020	2021	2022	2023	2024
Stokes Bay	-	Excellent	Excellent	Excellent	Good
Lee-on-Solent	-	Excellent	Excellent	Excellent	Excellent
Hillhead	-	Good	Excellent	Good	Good
Calshot	Excellent	Excellent	Excellent	Excellent	Excellent
Lepe	-	Excellent	Excellent	Excellent	Excellent
Gurnard	-	Good	Good	Good	Good
Cowes	-	Excellent	Excellent	Excellent	Excellent
East Cowes	-	-	Excellent	Excellent	Excellent
Ryde	-	Excellent	Good	Good	Good

Source: Environment Agency, 2024

⁶ Replaced by The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 on 31 January 2020.

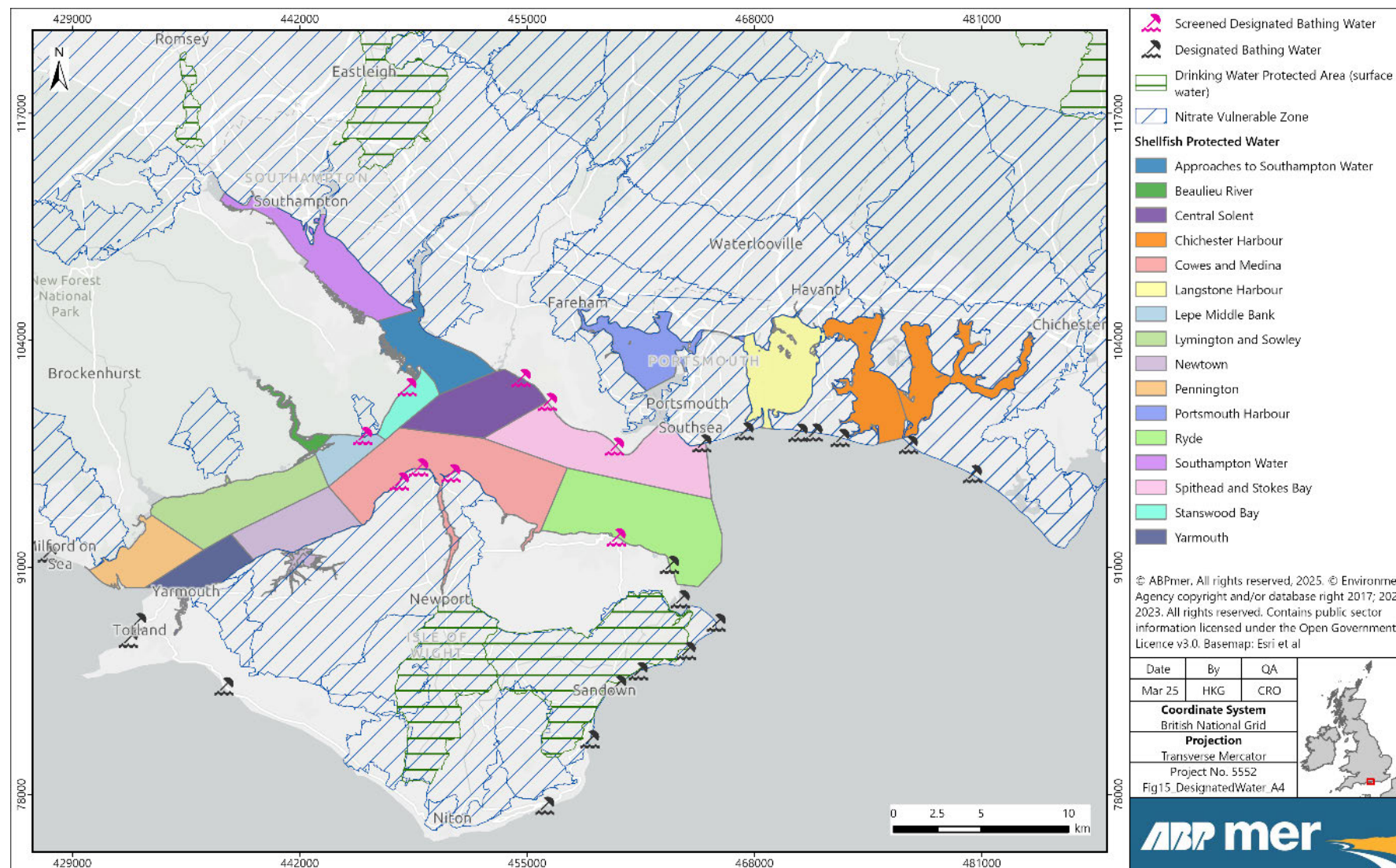


Figure 16. Designated Bathing Waters, Shellfish protected areas, Nitrate Vulnerable zones and Drinking Water Protected Areas in the study area

7.4.4 Water quality – Shellfish Waters Directive

The Shellfish Waters Directive (2006/113/EC) was repealed in December 2013 and subsumed within the WFD. The Shellfish Water Protected Areas (England and Wales) Directions 2016 require the Environment Agency (in England) to endeavour to observe a microbial standard in all Shellfish Water Protected Areas and to assess compliance against this standard to monitor microbial pollution.

The closest Shellfish Waters to the study area and with the potential for a hydromorphological link with maintenance dredging and/or disposal activities, are listed in Table 29 and shown in Figure 16. Compliance by these shellfish waters has been assessed by the Environment Agency using monitoring data.

The objective is to achieve 'imperative standards' and endeavouring to respect the guideline standards of the Shellfish Waters Directive. The last available information is from 2021, based on 2020 shellfish flesh sample results. This latest data show two sites failed and two passed. The remaining four sites were not assessed.

Sites failing on coliform guideline standards usually do so because shellfish accumulate bacteria from water as they filter it to feed. Human and animal waste is generally the source of coliform; control measures to manage source inputs typically include reducing inputs from sewage treatment and better management of farm derived waste.

Table 29. Shellfish waters classifications in study area

Shellfish Water Site	Water Body	2021
Beaulieu River	Beaulieu River	Not assessed
Cowes and Medina	Solent and Medina	Not assessed
Southampton Water Approach	Southampton Water	Fail
Southampton Water	Southampton Water	Fail
Central Solent	Solent	Not assessed
Lepe Middle Bank	Solent	Not assessed
Newtown Bank	Solent	Not assessed
Ryde	Solent	Guideline Pass
Spithead and Stokes Bay	Solent	Guideline Pass
Lymington (includes Sowley)	Solent	Not assessed
Stanswood Bay	Solent	Not assessed

Source: Environment Agency, 2022b

7.4.5 Water quality – Urban Waste Water Treatment Directive

The Urban Waste Water Treatment (England and Wales) Regulations 1994 (as amended) transpose the Urban Waste Water Treatment Directive (91/271/EEC) into English law. It aims to protect the environment from the adverse effects of the collection, treatment and discharge of urban waste water. It sets treatment levels on the basis of sizes of sewage discharges and the sensitivity of waters receiving the discharges. Sensitive areas under the Urban Waste Water Treatment Directive are water bodies affected by eutrophication due to elevated nitrate concentrations and act as an indication that action is required to prevent further pollution caused by nutrients.

There are five designated sensitive eutrophic areas (fluvial and coastal) within 5 km of the maintenance dredging and/or disposal activities. These are the River Test, River Itchen and the River Hamble, Hamble Estuary and Medina Estuary (Environment Agency, 2022a; Defra, 2023).

7.4.6 Water quality – Nitrates Directives

The Nitrates Directive (91/676/EEC), which is implemented in England by the Nitrate Pollution Prevention Regulations 2015 (as amended), aims to reduce water pollution from agricultural sources and to prevent such pollution occurring in the future (nitrogen is one of the nutrients that can affect plant growth). Under the Nitrates Directive, surface waters are identified if too much nitrogen has caused a change in plant growth which affects existing plants and animals and the use of the water body. The Test (Lower) water body overlaps with the Hamble Estuary Eutrophic Nitrate Vulnerable Zone (NVZ) (NVZ ID 3).

7.4.7 Directive overlap

The WFD makes clear that, in the case of protected areas (i.e. where the presence of a protected area introduces different targets to a particular water body), the more stringent objective applies. There is no indication from the latest South East RBMP that any of the WFD objectives would be more stringent than those of the Birds and Habitats Directives. Therefore, it is assumed that any WFD compliance assessment for maintenance dredging and disposal would defer to the outcomes of the MDP with regard to compliance with the objectives of internationally designated sites.

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9 Abbreviations/Acronyms

AA	Appropriate Assessment
ACENAPH	Acenaphthene
ACENAPT	Acenaphthylene
AEW	AEW UK
AHCH	alpha-Hexachlorocyclohexane
AL	Action Level
AL1	Action Level 1
AL2	Action Level 2
ANTHRAC	Anthracene
As	Arsenic
AWB	Artificial Water Body
BAA	Benzo[a]anthracene
BAP	Benzo[a]pyrene
BBF	Benzo[b]fluoranthene
BENZGHI	Benzo[g,h,i]perylene
BEP	Benzo[e]pyrene
BKF	Benzo[k]fluoranthene
BP	British Petroleum Company
BPEO	Best Practical Environmental Option
C1N	C1-Naphthalene
C1PHEN	C1-Phenanthrenes
C2N	C2-Naphthalene
C3N	C3-Naphthalene
CB	Chlorinated Biphenyls
CCO	Channel Coastal Observatory
CD	Chart Datum
Cd	Cadmium
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CHRYSEN	Chrysene
Cr	Chromium
Cu	Copper
DAS	Disposal at Sea
DBENAH	Dibenz[a,h]anthracene
DBENZA	Dibenzo[a,h]pyrene
DBT	Dibutyltin
DCLG	Department for Communities and Local Government
DDT	Dichlorodiphenyltrichloroethane
Defra	Department for Environment, Food and Rural Affairs
DGPS	Differential Global Positioning System
DIELDRIN	Dieldrin
DIO	Defence Infrastructure Estates
DO	Dissolved Oxygen
EA	Environmental Agency
EC	European Commission
EEC	European Economic Community
EMR	European Metal Recycling
EQS	Environmental Quality Standards
EU	European Union

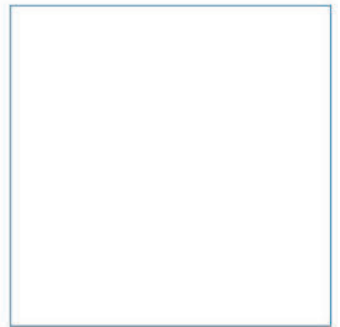
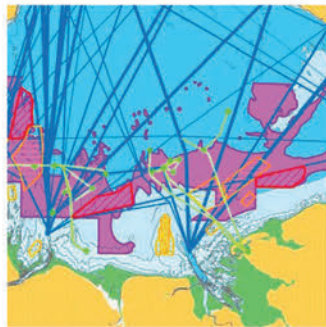
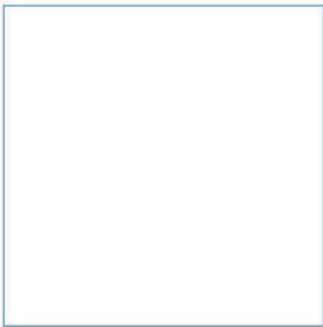
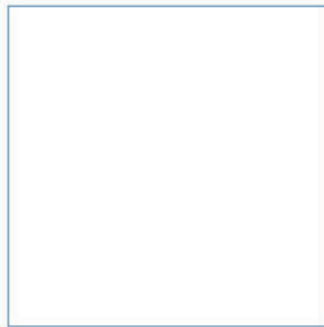
FLUORAN	Fluoran
FLUOREN	Fluorene
FOCI	Features of Conservation Importance
GCS	Good Chemical Status
GEP	Good Ecological Potential
GES	Good Environmental Status
GHCH	gamma-Hexachlorocyclohexane
GOV	Government
GS	Good Status
HAT	Highest Astronomical Tide
HCB	Hexachlorobenzene
Hg	Mercury
HMWB	Heavily Modified Water Body
HRA	Habitats Regulations Assessment
HW	High Water
ICES	International Council for the Exploration of the Sea
ID	Identity
IMU	Infralittoral muddy sand
INDPYR	Indeno[1,2,3-cd]pyrene
JNCC	Joint Nature Conservation Committee
LMS	Littoral Mixed Sediment
LMU	Littoral Muddy Sand
LMX	Littoral Muddy Sediment
LOD	Limit of Detection
LSE	Likely Significant Effect
LSN	Sample ID
LW	Low Water
MAGiC	Multi-Agency Geographic Information for the Countryside
MCZ	Marine Conservation Zone
MDL	Marina Developments Limited
MDP	Heavily Modified Water Body
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMO	Marine Management Organisation
MPA	Marine Protected Area
NAPTH	Naphthalene
NDPB	Non-Departmental Public Body
NERC	Natural Environment and Rural Communities
Ni	Nickel
NPPF	National Planning Policy Framework
NTL	Natural Tidal Limit
NVZ	Nitrate Vulnerable Zone
OCP	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PBDE	Polybrominated Diphenyl Ethers
PCB	Polychlorinated Biphenyls
PERYLEN	Perylene
PHENANT	Phenanthrene
PPDDE	p,p'-Dichlorodiphenyldichloroethylene
PPDDT	p,p'-Dichlorodiphenyltrichloroethane
PPTDE	p,p'-Dichlorodiphenyldichloroethane

PSA	Public Service Agreement
PSD	Priority Substances Directive
PYRENE	Pyrene
RAF	Royal Air Force
Ramsar	Wetlands of international importance designated under the Ramsar Convention
RBMP	River Basin Management Plan
RCP	Representative Concentration Pathways
RIS	Ramsar Information Sheet
SAC	Special Area of Conservation
SCOPAC	Standing Conference on Problems Associated with the Coastline
SCT	Southampton Container Terminal
SHA	Statutory Harbour Authority
SMC	Marchwood Sea Mounting
SPA	Special Protected Area
SSC	Suspended Sediment Concentrations
SSSI	Site of Special Scientific Interest
TBT	Tributyltin
THC	Total Hydrocarbon Content
TPH	Total Petroleum Hydrocarbons
TSHD	Trailing Suction Hopper Dredger
UK	United Kingdom
UKCP	United Kingdom Climate Projections
UKD	United Kingdom Dredge
US	United States (of America)
VTs	Vessel Traffic Services
WCA	Wildlife and Countryside Act
WFD	Water Framework Directive
WID	Water Injection Dredging
Zn	Zinc

Cardinal points/directions are used unless otherwise stated.

SI units are used unless otherwise stated.

Appendices



Innovative Thinking - Sustainable Solutions

A Sediment Quality Data

A.1 Cefas Guideline Action Levels (AL)

Table A1. Cefas Guideline Action Levels

Contaminant	Units	Cefas Guideline Action Levels	
		Action Level 1 (AL1)	Action Level 2 (AL2)
Arsenic (As)	mg/kg	20	100
Cadmium (Cd)	mg/kg	0.4	5
Chromium (Cr)	mg/kg	40	400
Copper (Cu)	mg/kg	40	400
Lead (Pb)	mg/kg	50	500
Mercury (Hg)	mg/kg	0.3	3
Nickel (Ni)	mg/kg	20	200
Zinc (Zn)	mg/kg	130	800
Dibutyltin (DBT)	mg/kg	0.1	1
Tributyltin (TBT)	mg/kg	0.1	1
Sum of ICES 7 PCB congeners	µg/kg	10	-
Sum of 25 PCB congeners	µg/kg	20	200
Acenaphthene (ACENAPH)	mg/kg	0.1	-
Acenaphthylene(ACENAPT)	mg/kg	0.1	-
Anthracene (ANTHRAC)	mg/kg	0.1	-
Benzo[a]anthracene (BAA)	mg/kg	0.1	-
Benzo[a]pyrene (BAP)	mg/kg	0.1	-
Benzo[b]fluoranthene (BBF)	mg/kg	0.1	-
Benzo[g,h,i]perylene (BENZGHI)	mg/kg	0.1	-
Benzo[e]perylene (BEP)	mg/kg	0.1	-
Benzo[k]fluoranthene (BKF)	mg/kg	0.1	-
C1-Napthalene (C1N)	mg/kg	0.1	-
C1-Phenanthrenes (C1PHEN)	mg/kg	0.1	-
C2-Napthalene (C2N)	mg/kg	0.1	-
C3-Napthalene (C3N)	mg/kg	0.1	-
Chrysene (CHRYSEN)	mg/kg	0.1	-
Dibenzo[a,h]anthracene (DBENAH)	mg/kg	0.1	-
Fluoranthene (FLUORAN)	mg/kg	0.1	-
Fluorene (FLUOREN)	mg/kg	0.1	-
Indeno[1,2,3-cd]pyrene (INDPYR)	mg/kg	0.1	-
Napthalene (NAPTH)	mg/kg	0.1	-
Perylene (PERYLEN)	mg/kg	0.1	-
Phenanthrene (PHENANT)	mg/kg	0.1	-
Pyrene (PYRENE)	mg/kg	0.1	-
Total Hydrocarbon Content (THC)	mg/kg	100	-
Dichlorodiphenyltrichloroethane (DDT)	µg/kg	1	-
Dieldrin	µg/kg	5	-

A.2 Sediment Quality Data

A.2.1 River Test berths and channel – Metals and tin results

Table A2. River Test Berths and Channel – Metals and Tin Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
159	Third Party	2001/01384	2001	8.2	0.07	20	9.2	13	0.05	8.6	38	0.0120	0.0420
160	ABP	2001/01385	2001	7.2	0.09	26	22	22	0.16	11	63	0.0710	0.2170
161	ABP	2001/01386	2001	8.2	0.06	24	20	17	0.08	11	49	0.0370	0.2010
162	Third Party	2001/01387	2001	8	0.11	29	26	28	0.41	12	69	0.0380	0.1290
163	ABP	2001/01388	2001	6.8	0.06	29	18	18	0.07	12	53	0.0490	0.2370
164	ABP	2001/01389	2001	35	0.06	54	30	29	0.1	27	100	0.0240	0.1060
165	Third Party	2001/01390	2001	7.5	0.08	35	28	24	0.21	12	67	0.0470	0.2560
166	ABP	2001/01393	2001	6.4	0.06	22	14	15	0.09	9.7	137	0.0200	0.0620
167	ABP	2001/01394	2001	14	0.08	34	28	199	0.7	13	94	0.0250	0.0630
171	Third Party	2001/01399	2001	6.8	0.05	19	13	12	0.1	8.3	48	0.0150	0.0560
172	Third Party	2001/01401	2001	8.4	0.18	33	22	42	0.72	15	88	0.0060	0.0110
173	Third Party	2001/01402	2001	5.3	0.04	13	10	9.7	0.05	6.5	38	0.0170	0.0720
174	Third Party	2001/01403	2001	6.2	0.07	28	27	19	0.22	12	68	0.0540	0.3920
176	ABP	2001/01406	2001	6.1	0.05	27	18	13	0.08	11	49	0.0290	0.1740
182	ABP	2001/03070	2001	6	0.06	26	14	12	0.03	9.2	47	0.0640	0.3790
185	Third Party	2001/00350	2001	8.1	0.08	29	47	34	0.1	12	154	0.0010	0.2876
186	Third Party	2001/00351	2001	7.4	0.09	33	25	29	0.14	9.4	74	0.0370	0.2330
187	Third Party	2001/00352	2001	6.1	0.06	27	19	19	0.07	9.1	65	0.0370	0.2330
188	Third Party	2001/00353	2001	7.7	0.09	28	27	26	0.11	9.3	76	0.0990	0.6290
189	Third Party	2001/00354	2001	7.2	0.13	29	20	19	0.1	11	438	0.4400	0.2440
190	Third Party	2001/00355	2001	5.9	0.08	25	20	15	0.07	11	59	0.0260	0.5690
191	Third Party	2001/00356	2001	6	0.06	22	17	18	0.07	7.2	51	0.0430	0.1960
192	Third Party	2001/00357	2001	6.6	0.06	23	17	18	0.08	7.1	44	0.0370	0.2240
193	Third Party	2001/00358	2001	0	0	0	0	0	0	0	0	0.0350	0.1790
194	Third Party	2001/00359	2001	6.2	0.06	26	19	20	0.1	7.6	53	0.0300	0.1430
201	Third Party	2001/01382	2001	7.3	0.12	23	19	24	0.21	9.4	57	0.0330	0.1060
202	ABP	2001/01383	2001	8.5	0.06	27	18	18	0.08	12	52	0.0320	0.1880
203	ABP	2001/01391	2001	9.4	0.08	39	18	16	0.1	17	56	0.0350	0.1840
204	ABP	2001/01392	2001	26	0.04	43	29	76	0.13	18	95	0.0120	0.0200
205	Third Party	2001/01398	2001	7.5	0.09	29	12	26	0.38	13	53	0.0020	0.0030
206	Third Party	2001/01400	2001	5.6	0.06	32	6.6	9	0.02	14	41	0.0010	0.0030
135	Third Party	2004/02498	2004	10	0.35	23	25	25	0.56	14	76	0.0286	0.0723
136	Third Party	2004/02499	2004	10	0.27	24	36	26	1	14	78	0.0576	0.2172
137	Third Party	2004/02500	2004	11	0.37	20	23	26	0.26	14	71	0.0149	0.0446
138	Third Party	2004/02522	2004	8	0.06	19	22	17	0.07	9.9	39	0.0481	0.1385
139	Third Party	2004/02523	2004	7.9	0.06	24	24	19	0.08	10	39	0.0607	0.2072
140	Third Party	2004/02524	2004	8	0.09	25	21	16	0.06	11	48	0.0229	0.0701
141	Third Party	2004/02525	2004	7.7	0.06	22	24	21	0.08	10	50	0.0453	0.1598
142	ABP	2004/02526	2004	9.1	0.06	19	25	22	0.12	8.7	41	0.0410	0.1074
100	ABP	2005/01400	2005	16	0.07	34	35	21	0.01	17	79	0.0394	0.5857
101	ABP	2005/01401	2005	16	0.1	30	26	19	0.03	30	73	0.0269	0.1501
102	ABP	2005/01402	2005	19	0.09	45	41	28	0.07	21	93	0.0312	0.0962
103	ABP	2005/01403	2005	15	0.06	24	26	20	0.01	15	64	0.0020	0.0432
104	ABP	2005/01404	2005	0	0	0	0	0	0	0	0	0.0000	0.0000
105	ABP	2005/01405	2005	12	0.11	27	43	22	0.01	15	85	0.1463	3.2987
106	ABP	2005/01406	2005	16	0.08	38	39	23	0.03	19	86	0.0313	0.2877
111	ABP	2005/01429	2005	17	0.06	31	20	14	0.2	16	56	0.0220	1.3898

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
112	ABP	2005/01430	2005	17	0.07	37	32	19	0.03	19	68	0.0277	0.2379
113	ABP	2005/01431	2005	17	0.08	30	27	17	0.01	19	63	0.0216	0.1517
80	ABP	2007/02179	2007	21	0.12	35	40	42	0.65	22	117	0.0020	0.0427
81	ABP	2007/02180	2007	17	0.18	38	63	41	0.16	25	115	0.0424	0.1087
82	Third Party	2007/02181	2007	20	0.14	35	59	42	0.1	22	128	0.0020	0.0603
83	Third Party	2007/02182	2007	20	0.19	50	43	37	0.08	31	117	0.0337	0.0511
84	Third Party	2007/02183	2007	18	0.19	39	92	65	0.39	23	148	0.0424	0.0836
85	ABP	2007/02184	2007	22	0.11	44	52	38	0.06	26	113	0.0020	0.0020
86	Third Party	2007/06613	2007	20	0.37	48	64	45	0.16	25	134	0.0609	0.1981
87	Third Party	2007/06614	2007	17	0.21	46	39	33	0.2	21	107	0.0328	0.1303
88	Third Party	2007/06615	2007	16	0.17	37	43	32	0.15	19	107	0.0268	0.0884
57	ABP	2008/00301	2008	33	0.15	40	18	19	0.07	23	76	0.0030	0.1176
64	ABP	2008/01550	2008	18	0.1	20	34	29	0.2	15	81	0.0233	0.0504
65	ABP	2008/01551	2008	20	0.11	26	31	29	0.14	17	88	0.0135	0.0373
66	ABP	2008/01552	2008	14	0.13	18	27	23	0.08	13	74	0.0250	0.1649
67	ABP	2008/01553	2008	10	0.03	19	9.5	13	0.02	18	58	0.0020	0.0089
68	ABP	2008/01554	2008	15	0.07	16	17	15	0.05	14	61	0.0219	0.3799
70	ABP	2008/01556	2008	15	0.2	20	34	26	0.11	14	97	0.0203	0.0800
71	ABP	2008/01557	2008	13	0.28	17	25	20	0.08	13	93	0.0110	0.0451
72	ABP	2008/01558	2008	16	0.1	16	27	21	0.07	15	67	0.0182	0.1091
73	ABP	2008/01559	2008	18	0.19	21	43	33	0.21	17	102	0.0286	0.1103
13	ABP	2009/00785	2009	2.3	0.04	0.55	2.8	4.6	0.02	0.81	18	0.0110	0.0581
15	ABP	2009/00787	2009	1.8	0.04	0.42	1.2	2.3	0.02	0.52	8.7	0.0063	0.0604
17	ABP	2009/00789	2009	0.73	0.04	0.35	1.2	1.7	0.02	0.72	6.2	0.0063	0.0241
20	ABP	2009/00792	2009	2.1	0.06	0.38	2.9	4	0.02	0.61	18	0.0119	0.0954
23	ABP	2009/00797	2009	16	0.13	19	38	28	0.13	16	84	0.0274	0.3165
27	ABP	2009/00801	2009	21	0.17	28	50	38	0.18	22	110	0.0164	0.0516
38	ABP	2009/01595	2009	19	0.15	30	41	31	0.19	30	109	0.0246	0.0718
41	Third Party	2009/01598	2009	16	0.14	22	40	34	0.12	19	123	0.0694	0.0895
43	Third Party	2009/01600	2009	19	0.54	41	104	164	0.79	25	343	0.2920	0.7028
46	Third Party	2009/01603	2009	15	0.35	35	97	77	0.67	21	244	0.2769	0.7945
48	Third Party	2009/01605	2009	18	0.43	33	72	67	0.8	25	181	0.0518	0.1063
52	Third Party	2009/01610	2009	0	0	0	0	0	0	0	0	0.0000	0.0000
53	Third Party	2009/01611	2009	0	0	0	0	0	0	0	0	0.0000	0.0000
1	ABP	2010/01527	2010	28	0.1	55	62	49	0.21	30	150	0.0050	0.0080
2	ABP	2010/01528	2010	24	0.1	56	54	46	0.2	28	140	0.0050	0.0376
3	Third Party	2010/01529	2010	17	0.07	34	72	37	0.18	20	118	0.0000	0.0000
4	Third Party	2010/01530	2010	22	0.17	40	69	53	0.3	25	156	0.0060	0.0404
5	Third Party	2010/01531	2010	28	0.09	30	33	30	0.1	19	87	0.0050	0.0090
215	ABP	2011/01112	2011	19	0.07	32	30	30	0.09	20	84	0.0030	0.0239
216	ABP	2011/01113	2011	19	0.11	31	31	31	0.1	19	90	0.0030	0.0767
217	ABP	2011/01114	2011	18	0.16	34	33	26	0.12	18	89	0.0171	0.2315
219	ABP	2011/01116	2011	15	0.09	25	18	21	0.09	17	58	0.0078	0.0272
220	ABP	2011/01117	2011	14	0.04	32	11	15	0.02	18	65	0.0040	0.0222
221	ABP	2011/01118	2011	16	0.15	35	64	91	0.38	19	215	0.2472	8.4804
222	ABP	2011/01119	2011	22	0.07	54	25	28	0.11	23	84	0.0020	0.0209
223	ABP	2011/01120	2011	24	0.1	53	31	30	0.15	24	94	0.0030	0.0155
234	ABP	2011/02826	2011	0	0	0	0	0	0	0	0	0.0342	0.0398
235	ABP	2011/02827	2011	0	0	0	0	0	0	0	0	0.0098	0.0520
236	ABP	2011/02828	2011	0	0	0	0	0	0	0	0	0.0118	0.0361
281	ABP	2012/0645/01	2012	15	0.04	35	28	9	0	28	98	0.0000	0.0190
282	ABP	2012/0646/01	2012	10	0.07	21	17	14	0.04	12	57	0.0150	0.1500
283	ABP	2012/0647/01	2012	13	0.07	24	21	15	0.03	13	64	0.0110	0.1130

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
296	Third Party	2012/01679	2012	20	0.2	43	59	49	0.2	22	130	0.0280	0.0360
297	Third Party	2012/01680	2012	22	0.2	54	54	48	0.18	25	130	0.0290	0.0290
298	Third Party	2012/01681	2012	21	0.26	57.64	172.03	49.87	0.38	33.01	167.86	0.0000	0.0000
310	Third Party	2015/21857	2015	21.74	0.38	64.75	46.63	33.4	0.11	29.45	124.81	0.0000	0.0561
311	Third Party	2015/21858	2015	19.43	0.32	55.74	57.06	30.93	<0.105	26.23	124.36	0.0000	0.0488
312	Third Party	2015/21857	2015	21.74	0.38	64.75	46.63	33.4	0.11	29.45	124.81	0.0000	0.0561
338	ABP	2016/441746 - 110174	2016	10.3	0.053	35.3	10.6	11	0.0431	12.7	46.3	0.0000	0.0000
339	ABP	2016/441114.3- 111073	2016	19.7	0.095	63.3	23.7	28	0.059	26.2	92.7	0.0000	0.0000
346	ABP	2016/440224 - 111841	2016	15.4	0.103	54.1	24.2	24.2	0.0562	20.9	86	0.0000	0.0000
341	ABP	2016/438849- 111724	2016	16	0.128	54.2	33.4	26	0.0853	22.6	102	0.0000	0.0000
342	ABP	2016/437941- 112015	2016	14.8	0.181	45.7	28.9	22.1	0.049	18.9	94.3	0.0000	0.0000
343	ABP	2016/437581- 112505	2016	12.3	0.227	37.9	28.2	23	0.0554	16.9	95.9	0.0000	0.0000
347	ABP	2016/442328.2- 110426	2016	19.3	0.177	58.4	43.1	81.1	0.103	26.3	183	0.0000	0.0000
340	ABP	2016/439476- 111809	2016	19.8	0.047	81.6	13.3	16.9	0.0165	23.3	78.3	0.0000	0.0000
344	ABP	2016/3728578	2016	16	0.084	66.7	20.4	20.7	0.0335	24.3	83.3	0.0000	0.1290
345	ABP	2016/3728579	2016	16	0.084	66.7	20.4	20.7	0.0335	24.3	83.3	0.0000	0.1290
10	ABP	4469705	2019	13	0.21	31	38	25	0.098	16	94	0.0077	0.0110
9	ABP	4469706	2019	11	0.15	36	26	21	0.083	15	76	0.0036	0.0150
8	ABP	4469707	2019	13	0.13	43	27	23	0.085	18	80	0.0043	0.0150
12	ABP	4469708	2019	21	0.059	50	11	16	0.036	11	63	<LOD	0.0019
13	ABP	4469709	2019	12	0.046	47	10	12	0.027	5.2	57	<LOD	0.0065
14	ABP	4469710	2019	16	0.081	50	21	18	0.093	21	74	<LOD	0.0037
7	ABP	4469711	2019	15	0.086	42	21	21	0.082	18	70	<LOD	0.0057
6	ABP	4469712	2019	15	0.084	45	23	24	0.1	19	75	<LOD	0.0058
5	ABP	4469713	2019	16	0.092	45	25	25	0.097	19	77	<LOD	0.0059
11	ABP	4469714	2019	15	0.13	46	34	36	0.15	21	130	0.0068	0.0160
1	ABP	MAR01485.001	2022	12.8	0.12	21.3	34.1	25	0.08	16.4	93.3		
2	ABP	MAR01485.002	2022	14.8	0.17	24.9	38.6	24.4	0.07	17.4	102		
3	ABP	MAR01485.003	2022	14.8	0.12	27.6	44.1	27.7	0.1	18.5	115		
4	ABP	MAR01485.004	2022	13.2	<LOD	16.4	20.7	15.1	0.03	14.8	68.3		
5	ABP	MAR01485.005	2022	11.9	0.16	20	22.5	18.5	0.11	15.2	64.4		
6	ABP	MAR01485.006	2022	16.2	0.16	29.5	36.1	33.9	0.13	18.7	95.3		
7	ABP	MAR01485.007	2022	16.2	0.11	27.1	33.4	28.6	0.11	18.8	89		
8	ABP	MAR01485.008	2022	18.7	0.14	31.4	36	31	0.12	21.1	92.3		
9	ABP	MAR01485.009	2022	18.8	0.13	29.4	31.9	28.5	0.1	20.2	85		
10	ABP	MAR01485.010	2022	19.7	0.3	35.9	32.9	26.9	0.1	27	86		

A.2.2 River Test berths and channel – Polycyclic aromatic hydrocarbon results

Table A3. River Test Berths and Channel – Polycyclic Aromatic Hydrocarbon Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	23BA	ACENAPH	ACENAPT	ANTHRAC	BAA	BAP	BBF	BENZGHI	BEP	BKF	C1N	C1PHEN
173	Third Party	2001/01402	2001	0.0001	0.0001	0.0001	0.0100	0.0940	0.1580	0.1700	0.0730	0.1140	0.0890	0.0320	0.1060
174	Third Party	2001/01403	2001	0.0001	0.0001	0.0001	0.0720	0.3450	0.4230	0.4670	0.1640	0.3070	0.3750	0.0860	0.3630
176	ABP	2001/01406	2001	0.0001	0.0001	0.0001	0.0130	0.1040	0.1840	0.2180	0.1130	0.1570	0.1090	0.0310	0.0960
135	Third Party	2004/02498	2004	0.0000	0.0820	0.0750	0.4760	0.8880	1.8340	2.8850	0.6280	1.3820	1.1080	0.0860	0.8330
136	Third Party	2004/02499	2004	0.0000	0.0440	0.0470	0.2920	0.6680	1.2130	1.9670	0.4810	0.9980	0.7980	0.0560	0.5020
137	Third Party	2004/02500	2004	0.0000	0.0640	0.0630	0.3670	0.6530	1.6940	2.6080	0.5920	1.2830	1.0660	0.0720	0.5710
138	ABP	2004/02522	2004	0.0000	0.0062	0.0053	0.0210	0.0670	0.1690	0.3610	0.1020	0.1890	0.1250	0.0230	0.0910
139	Third Party	2004/02523	2004	0.0000	0.0100	0.0120	0.0270	0.1720	0.3090	0.5910	0.2810	0.2430	0.1940	0.0550	0.1400
140	Third Party	2004/02524	2004	0.0000	0.0050	0.0190	0.0220	0.0700	0.1850	0.3070	0.0091	0.1830	0.1110	0.0350	0.0770
141	Third Party	2004/02525	2004	0.0000	0.0046	0.0110	0.0280	0.1190	0.2730	0.4310	0.1340	0.2650	0.1570	0.0400	0.1200
142	ABP	2004/02526	2004	0.0000	0.0085	0.0120	0.0700	0.1670	0.3770	0.5770	0.1680	0.3500	0.2210	0.0700	0.2230
104	ABP	2005/01404	2005	0.0000	0.0033	0.0049	0.0240	0.0930	0.1540	0.2790	0.0970	0.1200	0.0900	0.0190	0.0920
80	ABP	2007/02179	2007	0.0000	0.0044	0.0087	0.0210	0.0680	0.1580	0.3120	0.0850	0.1360	0.1050	0.0250	0.0940
81	ABP	2007/02180	2007	0.0000	0.0085	0.0110	0.0390	0.1000	0.3050	0.5450	0.1490	0.2190	0.1860	0.0270	0.1220
82	Third Party	2007/02181	2007	0.0000	0.0040	0.0059	0.0230	0.1130	0.1800	0.3240	0.0980	0.1240	0.1140	0.0170	0.0810
83	Third Party	2007/02182	2007	0.0000	0.0066	0.0043	0.0200	0.0780	0.1660	0.2980	0.0840	0.1110	0.0960	0.0110	0.0510
84	Third Party	2007/02183	2007	0.0000	0.0110	0.0170	0.0840	0.3360	0.5110	0.7630	0.2130	0.2800	0.2900	0.0540	0.2430
85	ABP	2007/02184	2007	0.0000	0.0035	0.0030	0.0220	0.0860	0.1530	0.2560	0.0770	0.1000	0.0900	0.0170	0.0710
57	ABP	2008/00301	2008	0.0000	0.0019	0.0054	0.0150	0.0390	0.0730	0.1300	0.0430	0.0570	0.0420	0.0130	0.0420
64	ABP	2008/01550	2008	0.0000	0.0045	0.0063	0.0280	0.0530	0.1030	0.2010	0.0880	0.0850	0.0690	0.0250	0.0990
65	ABP	2008/01551	2008	0.0000	0.0048	0.0083	0.0240	0.0700	0.1290	0.2250	0.0970	0.1010	0.0820	0.0270	0.1170
66	ABP	2008/01552	2008	0.0000	0.0034	0.0060	0.0220	0.0770	0.1460	0.1390	0.0950	0.0690	0.0510	0.0053	0.0460
67	ABP	2008/01553	2008	0.0000	0.0001	0.0004	0.0006	0.0018	0.0027	0.0036	0.0045	0.0011	0.0016	0.0003	0.0028
68	ABP	2008/01554	2008	0.0000	0.0014	0.0057	0.0100	0.0440	0.0660	0.0640	0.0410	0.0310	0.0250	0.0025	0.0300
70	ABP	2008/01556	2008	0.0000	0.0080	0.0200	0.0360	0.1730	0.2670	0.2500	0.1650	0.1250	0.0960	0.0069	0.0770
71	ABP	2008/01557	2008	0.0000	0.0041	0.0360	0.0480	0.1310	0.1640	0.1600	0.0930	0.0760	0.0590	0.0086	0.1000
72	ABP	2008/01558	2008	0.0000	0.0026	0.0046	0.0150	0.0690	0.1310	0.1130	0.0730	0.0570	0.0450	0.0035	0.0490
73	ABP	2008/01559	2008	0.0000	0.0043	0.0110	0.0220	0.0910	0.1370	0.1460	0.0910	0.0700	0.0580	0.0079	0.0610
13	ABP	2009/00785	2009	0.0000	0.0112	0.0354	0.1582	0.2915	0.2750	0.2363	0.2343	0.1717	0.1933	0.0556	0.3664
15	ABP	2009/00787	2009	0.0000	0.0100	0.0062	0.0478	0.1485	0.1611	0.1495	0.1384	0.1062	0.1069	0.0063	0.1360
17	ABP	2009/00789	2009	0.0000	0.0086	0.0046	0.0200	0.0187	0.0608	0.0626	0.0388	0.0387	0.0531	0.0085	0.0377
20	ABP	2009/00792	2009	0.0000	0.0145	0.0204	0.0462	0.1052	0.1602	0.1255	0.1570	0.1208	0.1453	0.0266	0.1161
23	ABP	2009/00797	2009	0.0000	0.0091	0.0071	0.0391	0.0928	0.1393	0.1053	0.1505	0.1182	0.1033	0.0196	0.1632
27	ABP	2009/00801	2009	0.0000	0.0142	0.0123	0.0480	0.0888	0.1504	0.1858	0.1277	0.1148	0.1075	0.0350	0.1571
43	ABP	2009/01600	2009	0.0000	0.0975	0.3247	0.6547	1.5204	1.3276	1.7972	0.6327	0.7870	0.7622	0.2075	2.2305
46	ABP	2009/01603	2009	0.0000	0.0265	0.1878	0.3677	1.3586	1.5971	2.2785	0.9222	1.0598	0.9416	0.1130	0.9186
48	ABP	2009/01605	2009	0.0000	0.0546	1.4346	0.7500	1.7285	2.0809	3.0014	1.0293	1.4045	1.2045	1.0983	2.3016
52	ABP	2009/01610	2009	0.0000	0.0087	0.0284	0.0460	0.1369	0.2813	0.3587	0.1714	0.1883	0.1238	0.0383	0.1774
1	ABP	2010/01527	2010	0.0000	0.0001	0.0001	0.0291	0.0980	0.1374	0.2271	0.1044	0.1097	0.0940	0.0001	0.1141
2	ABP	2010/01528	2010	0.0000	0.0001	0.0086	0.0282	0.1027	0.1304	0.2347	0.1005	0.1134	0.1007	0.0260	0.1035
3	Third Party	2010/01529	2010	0.0000	0.0001	0.0122	0.0378	0.1399	0.1733	0.2699	0.1051	0.1274	0.1260	0.0001	0.1243
4	Third Party	2010/01530	2010	0.0000	0.0001	0.0145	0.0492	0.1746	0.2315	0.3570	0.1424	0.1571	0.1389	0.0001	0.1425
5	Third Party	2010/01531	2010	0.0000	0.0001	0.0001	0.0237	0.1039	0.1216	0.1881	0.0887	0.0920	0.0726	0.0001	0.1277
215	ABP	2011/01112	2011	0.0000	0.0055	0.0053	0.0214	0.0667	0.0931	0.1495	0.0885	0.0811	0.0711	0.0256	0.0916
216	ABP	2011/01113	2011	0.0000	0.0060	0.0060	0.0162	0.0773	0.1050	0.1655	0.1025	0.0904	0.0778	0.0268	0.0963
217	ABP	2011/01114	2011	0.0000	0.0058	0.0083	0.0179	0.0882	0.1301	0.1809	0.1167	0.1009	0.0920	0.0231	0.0903
219	ABP	2011/01116	2011	0.0000	0.0033	0.0048	0.0135	0.0445	0.0653	0.0868	0.0595	0.0558	0.0455	0.0192	0.0629
220	ABP	2011/01117	2011	0.0000	0.0004	0.0014	0.0022	0.0153	0.0088	0.0136	0.0130	0.0069	0.0077	0.0016	0.0159
221	ABP	2011/01118	2011	0.0000	0.0114	0.0249	0.0443	0.1787	0.2786	0.3397	0.2198	0.1949	0.1850	0.0318	0.1753

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	23BA	ACENAPH	ACENAPT	ANTHRAC	BAA	BAP	BBF	BENZGHI	BEP	BKF	C1N	C1PHEN
222	ABP	2011/01119	2011	0.0000	0.0036	0.0038	0.0128	0.0539	0.0755	0.1157	0.0745	0.0659	0.0563	0.0233	0.0754
223	ABP	2011/01120	2011	0.0000	0.0042	0.0035	0.0137	0.0572	0.0775	0.1255	0.0734	0.0652	0.0568	0.0257	0.0980
281	ABP	2012/0645/01	2012	0.0000	0.0000	0.001	0.001	0	0.004	0.006	0.012	0.0030	0.0030	0.002	0.016
282	ABP	2012/0646/01	2012	0.0000	0.0070	0.03	0.029	0.148	0.155	0.21	0.116	0.1030	0.0930	0.013	0.101
283	ABP	2012/0647/01	2012	0.0000	0.0050	0.003	0.009	0.05	0.071	0.092	0.065	0.0490	0.0430	0.01	0.06
296	Third Party	2012/01679	2012	0.0000	0.0120	0.01	0.041	0.129	0.203	0.307	0.181	0.1570	0.1430	0.034	0.141
297	Third Party	2012/01680	2012	0.0000	0.0100	0.008	0.026	0.112	0.183	0.289	0.175	0.1450	0.1370	0.03	0.118
310	Third Party	2015/21857	2015	0.0112	0.0150	0.0279	0.127	0.179	0.184	0.162	0.165	0.0973	0.0382	0.141	0.0703
311	Third Party	2015/21858	2015	0.0105	0.0175	0.0275	0.129	0.17	0.192	0.173	0.181	0.0984	0.0693	0.161	0.117
312	Third Party	2015/21857	2015	0.0112	0.0150	0.0279	0.127	0.179	0.184	0.162	0.165	0.0973	0.0382	0.141	0.0703
10	ABP	4469705.00	2019		26.0000	20	35	170	270	260	200	210	130	42	190
9	ABP	4469706.00	2019		18.0000	18	33	160	260	260	190	210	130	34	100
8	ABP	4469707.00	2019		<LOD	<LOD	14	78	120	120	100	100	59	23	79
12	ABP	4469708.00	2019		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	20
13	ABP	4469709.00	2019		<LOD	<LOD	<LOD	16	17	20	16	16	10	<LOD	20
14	ABP	4469710.00	2019		<LOD	<LOD	<LOD	12	16	19	17	16	<LOD	11	35
7	ABP	4469711.00	2019		<LOD	<LOD	<LOD	32	44	52	37	41	25	12	35
6	ABP	4469712.00	2019		<LOD	<LOD	11	54	73	80	61	64	37	23	63
5	ABP	4469713.00	2019		<LOD	<LOD	14	73	100	120	87	92	54	26	91
11	ABP	4469714.00	2019		<LOD	<LOD	88	49	74	85	64	68	40	27	93

Table A4. River Test Berths and Channel – Polycyclic Aromatic Hydrocarbon Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	C2N	C3N	CHRYSEN	DBENZAH	FLUORAN	FLUOREN	INDPYR	NAPTH	PERYLEN	PHENANT	PYRENE	THC
173	Third Party	2001/01402	2001	0.0570	0.1230	0.0830	0.0170	0.1560	0.0001	0.0920	0.0120	0.0690	0.0420	0.1940	0
174	Third Party	2001/01403	2001	0.1120	0.2140	0.3180	0.0730	0.6340	0.0001	0.1470	0.0450	0.1420	0.1350	0.5890	0
176	ABP	2001/01406	2001	0.0420	0.0860	0.1140	0.0270	0.2030	0.0001	0.1350	0.0140	0.1720	0.0310	0.2710	0
135	Third Party	2004/02498	2004	0.1440	0.1100	1.0350	0.1590	1.4000	0.1210	0.6480	0.0960	0.6060	0.3580	9.1420	2003
136	Third Party	2004/02499	2004	0.1090	0.3760	0.7410	0.1080	1.1800	0.0840	0.4750	0.0640	0.4310	0.3360	5.1170	1358
137	Third Party	2004/02500	2004	0.1160	0.3980	0.8460	0.1440	1.2070	0.0950	0.5850	0.0750	0.5830	0.3480	7.0520	1727
138	ABP	2004/02522	2004	0.0480	0.1190	0.0780	0.0200	0.1390	0.0087	0.0960	0.0130	0.1340	0.0430	0.2390	231
139	Third Party	2004/02523	2004	0.0890	0.1890	0.1110	0.0620	0.2220	0.0130	0.3460	0.0300	0.2040	0.0630	0.3290	532
140	Third Party	2004/02524	2004	0.0420	0.0780	0.0790	0.0026	0.1700	0.0140	0.0110	0.0150	0.1240	0.0580	0.2860	493
141	Third Party	2004/02525	2004	0.0560	0.1100	0.1260	0.0450	0.2660	0.0130	0.1700	0.0150	0.1850	0.0720	0.3510	426
142	ABP	2004/02526	2004	0.0910	0.2180	0.1830	0.0570	0.4220	0.0160	0.2060	0.0240	0.2230	0.1030	0.5250	516
104	ABP	2005/01404	2005	0.0400	0.0980	0.1170	0.0280	0.1880	0.0073	0.1210	0.0120	0.1450	0.0460	0.3950	255
80	ABP	2007/02179	2007	0.0490	0.0990	0.0840	0.0260	0.1540	0.0110	0.0920	0.0150	0.1720	0.0490	0.2090	212
81	ABP	2007/02180	2007	0.0630	0.0880	0.0930	0.0430	0.2170	0.0130	0.1820	0.0200	0.2040	0.0730	0.4130	288
82	Third Party	2007/02181	2007	0.0280	0.0750	0.1040	0.0250	0.3150	0.0110	0.1240	0.0140	0.1630	0.0480	0.0470	282
83	Third Party	2007/02182	2007	0.0230	0.0440	0.0430	0.0240	0.1800	0.0096	0.1080	0.0120	0.1260	0.0320	0.3870	292
84	Third Party	2007/02183	2007	0.0940	0.1640	0.2580	0.0580	0.9260	0.0300	0.2650	0.0360	0.2750	0.1850	0.0640	489
85	ABP	2007/02184	2007	0.0240	0.0760	0.0680	0.0230	0.2320	0.0055	0.1020	0.0120	0.1340	0.0360	0.2250	242
57	ABP	2008/00301	2008	0.0310	0.0790	0.0320	0.0100	0.1020	0.0066	0.0450	0.0069	0.0540	0.0300	0.1330	99
64	ABP	2008/01550	2008	0.0640	0.0980	0.0440	0.0220	0.1500	0.0098	0.0950	0.0150	0.1510	0.0490	0.1940	260
65	ABP	2008/01551	2008	0.0680	0.1290	0.0620	0.0180	0.1860	0.0100	0.1050	0.0150	0.1160	0.0620	0.2110	211
66	ABP	2008/01552	2008	0.0290	0.0620	0.0620	0.0220	0.1930	0.0065	0.0940	0.0100	0.1210	0.0340	0.2030	226
67	ABP	2008/01553	2008	0.0019	0.0075	0.0032	0.0006	0.0051	0.0006	0.0055	0.0010	0.0210	0.0013	0.0088	88
68	ABP	2008/01554	2008	0.0087	0.0320	0.0450	0.0097	0.1020	0.0039	0.0490	0.0048	0.0600	0.0230	0.1210	170
70	ABP	2008/01556	2008	0.0330	0.1250	0.1630	0.0410	0.3740	0.0230	0.1780	0.0250	0.1740	0.0710	0.3750	374
71	ABP	2008/01557	2008	0.0410	0.0990	0.1270	0.0220	0.3420	0.0260	0.0920	0.0270	0.1390	0.1050	0.3190	426
72	ABP	2008/01558	2008	0.0180	0.0690	0.0630	0.0180	0.1520	0.0068	0.0770	0.0087	0.1030	0.0310	0.1760	223
73	ABP	2008/01559	2008	0.0270	0.1440	0.0710	0.0240	0.1890	0.0150	0.0940	0.0200	0.1710	0.0330	0.2500	358

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	C2N	C3N	CHRYSEN	DBENZAH	FLUORAN	FLUOREN	INDPYR	NAPTH	PERYLEN	PHENANT	PYRENE	THC
13	ABP	2009/00785	2009	0.1410	0.4041	0.3091	0.0511	0.6413	0.0342	0.2899	0.0263	0.1381	0.2641	0.5685	467
15	ABP	2009/00787	2009	0.0302	0.1100	0.1523	0.0247	0.3669	0.0069	0.1540	0.0078	0.0679	0.0478	0.3634	295
17	ABP	2009/00789	2009	0.0162	0.0307	0.0266	0.0111	0.0412	0.0039	0.0526	0.0069	0.0387	0.0118	0.2321	194
20	ABP	2009/00792	2009	0.0501	0.0821	0.1170	0.0524	0.2440	0.0095	0.2229	0.0203	0.1241	0.0596	0.2564	347
23	ABP	2009/00797	2009	0.0598	0.0693	0.1078	0.0482	0.1442	0.0092	0.1666	0.0192	0.1395	0.0610	0.1828	313
27	ABP	2009/00801	2009	0.1120	0.1662	0.0928	0.0350	0.1831	0.0145	0.1558	0.0157	0.1490	0.0435	0.2211	344
43	ABP	2009/01600	2009	2.2882	5.0406	1.5368	0.2802	3.6797	0.2560	0.8375	0.2130	0.5911	1.5747	4.2708	1792
46	ABP	2009/01603	2009	0.2401	0.5324	1.0794	0.3312	2.7184	0.1683	1.1456	0.0892	0.5220	1.0875	3.4767	1325
48	ABP	2009/01605	2009	1.5813	1.7568	1.6874	0.3031	7.0507	1.6750	1.2258	0.2694	0.5597	6.7036	7.0251	1802
52	ABP	2009/01610	2009	0.1283	0.2409	0.1321	0.0530	0.3612	0.0321	0.1839	0.0304	0.3069	0.1686	0.7383	423
1	ABP	2010/01527	2010	0.0001	0.0001	0.0800	0.0198	0.2216	0.0001	0.1082	0.0001	0.1334	0.0620	0.2782	384
2	ABP	2010/01528	2010	0.0001	0.0001	0.0530	0.0225	0.2331	0.0001	0.1155	0.0140	0.1479	0.0671	0.2852	408
3	Third Party	2010/01529	2010	0.0001	0.0001	0.0880	0.0250	0.2547	0.0001	0.1230	0.0001	0.1611	0.0743	0.3339	417
4	Third Party	2010/01530	2010	0.0001	0.0001	0.0913	0.0411	0.3045	0.0001	0.1736	0.0001	0.1757	0.0978	0.4447	484
5	Third Party	2010/01531	2010	0.0001	0.0001	0.0733	0.0198	0.2023	0.0001	0.1125	0.0001	0.1323	0.0634	0.2490	453
215	ABP	2011/01112	2011	0.0487	0.0947	0.0431	0.0151	0.1522	0.0072	0.1042	0.0142	0.1311	0.0325	0.1623	307
216	ABP	2011/01113	2011	0.0550	0.1079	0.0538	0.0163	0.1678	0.0086	0.1163	0.0143	0.1198	0.0380	0.1798	308
217	ABP	2011/01114	2011	0.0511	0.0867	0.0670	0.0195	0.2134	0.0091	0.1348	0.0149	0.1225	0.0473	0.1983	306
219	ABP	2011/01116	2011	0.0378	0.0721	0.0272	0.0097	0.0887	0.0059	0.0704	0.0105	0.1525	0.0255	0.1556	252
220	ABP	2011/01117	2011	0.0047	0.0166	0.0041	0.0012	0.0249	0.0013	0.0160	0.0013	0.0209	0.0049	0.0346	81
221	ABP	2011/01118	2011	0.0594	0.1286	0.1368	0.0392	0.4065	0.0248	0.2510	0.0208	0.1439	0.1042	0.4057	422
222	ABP	2011/01119	2011	0.0535	0.1174	0.0338	0.0121	0.1107	0.0063	0.0877	0.0105	0.1192	0.0239	0.1209	278
223	ABP	2011/01120	2011	0.0490	0.1276	0.0396	0.0115	0.1079	0.0059	0.0880	0.0117	0.1296	0.0254	0.1180	280
281	ABP	2012/0645/01	2012	0.004	0.014	0.002	0.001	0.01	0.001	0.014	0.001	0.0250	0.0040	0.014	154
282	ABP	2012/0646/01	2012	0.03	0.065	0.122	0.025	0.319	0.017	0.149	0.008	0.0790	0.1150	0.29	182
283	ABP	2012/0647/01	2012	0.019	0.042	0.035	0.011	0.096	0.004	0.081	0.007	0.0560	0.0230	0.107	152
296	Third Party	2012/01679	2012	0.071	0.134	0.094	0.037	0.267	0.014	0.216	0.022	0.1790	0.0770	0.316	461
297	Third Party	2012/01680	2012	0.068	0.123	0.076	0.032	0.24	0.01	0.199	0.021	0.1720	0.0630	0.276	514
310	Third Party	2015/21857	2015	0.122	0.122	0.0387	0.241	0.0144	0.178	0.0309	0.112	0.0713	0.2630		
311	Third Party	2015/21858	2015	0.147	0.113	0.0446	0.24	0.0169	0.169	0.0567	0.112	0.0833	0.2610		
312	Third Party	2015/21857	2015	0.122	0.122	0.0387	0.241	0.0144	0.178	0.0309	0.112	0.0713	0.2630		
338	ABP	2016/441746 - 110174	2016												109
339	ABP	2016/441114.3- 111073	2016												234
346	ABP	2016/440224 - 111841	2016												203
341	ABP	2016/438849- 111724	2016												311
342	ABP	2016/437941- 112015	2016												448
343	ABP	2016/437581- 112505	2016												504
347	ABP	2016/442328.2- 110426	2016												203
340	ABP	2016/439476- 111809	2016												249
344	ABP	2016/3728578	2016												540
345	ABP	2016/3728579	2016												151
10	ABP	4469705.00	2019	39	62	150	41	360	16	170	74	140	95	380	1100
9	ABP	4469706.00	2019	39	43	130	38	310	15	170	64	140	86	330	490
8	ABP	4469707.00	2019	29	39	61	17	170	<LOD	83	<LOD	95	57	190	380
12	ABP	4469708.00	2019	<LOD	10	<LOD	<LOD	18	<LOD	<LOD	<LOD	17	<LOD	35	140
13	ABP	4469709.00	2019	<LOD	11	12	<LOD	37	<LOD	14	<LOD	19	12	41	96

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	C2N	C3N	CHRYSEN	DBENZAH	FLUORAN	FLUOREN	INDPYR	NAPTH	PERYLEN	PHENANT	PYRENE	THC
14	ABP	4469710.00	2019	16	23	<LOD	<LOD	33	<LOD	14	<LOD	22	14	44	140
7	ABP	4469711.00	2019	18	19	24	<LOD	64	<LOD	32	<LOD	48	14	87	210
6	ABP	4469712.00	2019	26	28	39	10	85	<LOD	53	<LOD	88	24	150	270
5	ABP	4469713.00	2019	30	48	53	15	140	<LOD	70	23	100	35	200	320
11	ABP	4469714.00	2019	26	34	39	11	88	<LOD	57	<LOD	100	25	130	440
1	ABP	MAR01485.001	2022												104
2	ABP	MAR01485.002	2022												41.5
3	ABP	MAR01485.003	2022												12.5
4	ABP	MAR01485.004	2022												16.6
5	ABP	MAR01485.005	2022												8.36
6	ABP	MAR01485.006	2022												17.6
7	ABP	MAR01485.007	2022												22.7
8	ABP	MAR01485.008	2022												18.8
9	ABP	MAR01485.009	2022												21.1
10	ABP	MAR01485.010	2022												16.5

A.2.3 River Test berths and channel – Polychlorinated biphenyl results

Table A5. River Test Berths and Channel – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#101	CB#105	CB#110	CB#118	CB#128	CB#138	CB#141	CB#149	CB#151	CB#153	CB#156	CB#158
173	Third Party	2001/01402	2001	0.0004	0.0000	0.0006	0.0005	0.0000	0.0005	0.0000	0.0004	0.0000	0.0005	0.0000	0.0000
174	Third Party	2001/01403	2001	0.0013	0.0004	0.0026	0.0014	0.0003	0.0020	0.0003	0.0014	0.0004	0.0017	0.0000	0.0000
176	ABP	2001/01406	2001	0.0000	0.0000	0.0011	0.0006	0.0000	0.0006	0.0000	0.0005	0.0000	0.0006	0.0000	0.0000
185	Third Party	2001/00350	2001	0.0016	0.0010	0.0035	0.0020	0.0007	0.0030	0.0008	0.0021	0.0006	0.0029	0.0005	0.0004
186	Third Party	2001/00351	2001	0.0013	0.0009	0.0031	0.0017	0.0006	0.0026	0.0007	0.0019	0.0006	0.0025	0.0005	0.0004
187	Third Party	2001/00352	2001	0.0011	0.0008	0.0026	0.0015	0.0006	0.0023	0.0006	0.0016	0.0005	0.0022	0.0004	0.0003
188	Third Party	2001/00353	2001	0.0020	0.0007	0.0040	0.0020	0.0005	0.0031	0.0006	0.0021	0.0006	0.0031	0.0000	0.0003
189	Third Party	2001/00354	2001	0.0012	0.0000	0.0027	0.0012	0.0000	0.0017	0.0003	0.0011	0.0000	0.0016	0.0000	0.0000
190	Third Party	2001/00355	2001	0.0013	0.0000	0.0025	0.0011	0.0003	0.0016	0.0003	0.0010	0.0000	0.0016	0.0000	0.0000
191	Third Party	2001/00356	2001	0.0011	0.0000	0.0025	0.0012	0.0003	0.0017	0.0004	0.0012	0.0003	0.0018	0.0000	0.0000
192	Third Party	2001/00357	2001	0.0008	0.0000	0.0022	0.0010	0.0000	0.0015	0.0000	0.0009	0.0000	0.0014	0.0000	0.0000
193	Third Party	2001/00358	2001	0.0017	0.0006	0.0031	0.0014	0.0004	0.0021	0.0005	0.0013	0.0004	0.0020	0.0000	0.0002
194	Third Party	2001/00359	2001	0.0011	0.0000	0.0022	0.0010	0.0003	0.0016	0.0003	0.0010	0.0000	0.0015	0.0000	0.0000
135	Third Party	2004/02498	2004	0.0002	0.0015	0.0002	0.0036	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0002	0.0002
136	Third Party	2004/02499	2004	0.0092	0.0033	0.0110	0.0086	0.0018	0.0084	0.0014	0.0053	0.0015	0.0073	0.0012	0.0011
137	Third Party	2004/02500	2004	0.0002	0.0012	0.0002	0.0025	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002	0.0002
138	ABP	2004/02522	2004	0.0006	0.0002	0.0007	0.0006	0.0002	0.0009	0.0002	0.0006	0.0002	0.0008	0.0002	0.0002
139	Third Party	2004/02523	2004	0.0009	0.0003	0.0010	0.0008	0.0002	0.0012	0.0002	0.0009	0.0002	0.0012	0.0002	0.0002
140	Third Party	2004/02524	2004	0.0007	0.0003	0.0008	0.0006	0.0002	0.0009	0.0002	0.0006	0.0002	0.0008	0.0002	0.0002
141	Third Party	2004/02525	2004	0.0007	0.0003	0.0008	0.0007	0.0002	0.0011	0.0002	0.0007	0.0002	0.0010	0.0002	0.0002
142	ABP	2004/02526	2004	0.0009	0.0004	0.0010	0.0008	0.0002	0.0013	0.0002	0.0009	0.0003	0.0012	0.0002	0.0002
80	ABP	2007/02179	2007	0.0005	0.0005	0.0006	0.0006	0.0003	0.0007	0.0003	0.0006	0.0003	0.0007	0.0003	0.0003
81	ABP	2007/02180	2007	0.0010	0.0005	0.0011	0.0009	0.0004	0.0013	0.0004	0.0011	0.0004	0.0016	0.0004	0.0003
82	Third Party	2007/02181	2007	0.0008	0.0005	0.0009	0.0007	0.0003	0.0010	0.0003	0.0008	0.0003	0.0011	0.0003	0.0003
83	Third Party	2007/02182	2007	0.0010	0.0005	0.0011	0.0009	0.0003	0.0011	0.0003	0.0009	0.0003	0.0012	0.0003	0.0003
84	Third Party	2007/02183	2007	0.0013	0.0006	0.0015	0.0012	0.0004	0.0017	0.0004	0.0013	0.0004	0.0018	0.0004	0.0003
85	ABP	2007/02184	2007	0.0006	0.0005	0.0007	0.0006	0.0003	0.0007	0.0003	0.0006	0.0003	0.0007	0.0003	0.0003
57	ABP	2008/00301	2008	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
70	ABP	2008/01556	2008	0.0064	0.0002	0.0049	0.0028	0.0019	0.0130	0.0042	0.0110	0.0035	0.0140	0.0014	0.0015
72	ABP	2008/01558	2008	0.0005	0.0002	0.0008	0.0006	0.0002	0.0006	0.0002	0.0004	0.0002	0.0004	0.0002	0.0002

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#101	CB#105	CB#110	CB#118	CB#128	CB#138	CB#141	CB#149	CB#151	CB#153	CB#156	CB#158
13	ABP	2009/00785	2009	0.0005	0.0002	0.0005	0.0004	0.0002	0.0005	0.0002	0.0005	0.0002	0.0006	0.0002	0.0002
15	ABP	2009/00787	2009	0.0003	0.0002	0.0003	0.0002	0.0002	0.0003	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002
17	ABP	2009/00789	2009	0.0004	0.0002	0.0004	0.0003	0.0002	0.0003	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
20	ABP	2009/00792	2009	0.0007	0.0002	0.0007	0.0006	0.0002	0.0007	0.0002	0.0005	0.0002	0.0007	0.0002	0.0002
23	ABP	2009/00797	2009	0.0009	0.0002	0.0009	0.0008	0.0002	0.0010	0.0002	0.0009	0.0003	0.0011	0.0002	0.0002
48	ABP	2009/01605	2009	0.0051	0.0009	0.0042	0.0030	0.0011	0.0092	0.0018	0.0088	0.0028	0.0100	0.0002	0.0009
52	ABP	2009/01610	2009	0.0022	0.0005	0.0021	0.0017	0.0005	0.0024	0.0004	0.0023	0.0006	0.0027	0.0003	0.0003
53	ABP	2009/01611	2009	0.0687	0.0120	0.0782	0.0495	0.0130	0.0810	0.0100	0.0731	0.0120	0.0717	0.0080	0.0066
281	ABP	2012/0645/01	2012	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
282	ABP	2012/0646/01	2012	0.0004	0.0002	0.0004	0.0004	0.0002	0.0003	0.0002	0.0004	0.0002	0.0005	0.0002	0.0002
283	ABP	2012/0647/01	2012	0.0005	0.0002	0.0004	0.0004	0.0002	0.0004	0.0002	0.0004	0.0002	0.0005	0.0002	0.0002
296	Third Party	2012/01679	2012	0.0008	0.0002	0.0009	0.0008	0.0002	0.0010	0.0002	0.0008	0.0002	0.0011	0.0002	0.0002
297	Third Party	2012/01680	2012	0.0008	0.0002	0.0008	0.0007	0.0002	0.0009	0.0002	0.0008	0.0002	0.0009	0.0002	0.0002
10	ABP	4469705	2019	0.00047	0.00019	0.00051	0.00043	0.00014	0.00061	<LOD	0.00034	0.0001	0.00054	<LOD	<LOD
9	ABP	4469706	2019	0.00031	0.00015	0.00038	0.00029	0.0001	0.0004	0.00027	0.00027	0.00008	0.00042	<LOD	<LOD
8	ABP	4469707	2019	0.00029	0.0001	0.00031	0.00027	0.000084	0.00039	<LOD	0.00023	<LOD	0.00037	<LOD	<LOD
12	ABP	4469708	2019	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
13	ABP	4469709	2019	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.000084	<LOD	<LOD
14	ABP	4469710	2019	0.00041	0.00015	0.00048	0.00024	<LOD	0.00024	<LOD	0.00017	<LOD	0.00024	<LOD	<LOD
7	ABP	4469711	2019	0.00021	<LOD	0.00023	0.00018	<LOD	0.00026	<LOD	0.00019	<LOD	0.0003	<LOD	<LOD
6	ABP	4469712	2019	0.00016	0.000085	0.00019	0.00019	<LOD	0.00022	<LOD	0.00017	<LOD	0.00026	<LOD	<LOD
5	ABP	4469713	2019	0.00019	<LOD	0.00022	0.00017	<LOD	0.00025	<LOD	0.00018	<LOD	0.00028	<LOD	<LOD
11	ABP	4469714	2019	0.00059	0.00013	0.00055	0.00038	0.00024	0.0011	0.00045	0.0017	0.00078	0.0025	0.000083	0.00013

Table A6. River Test Berths and Channel – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#170	CB#18	CB#180	CB#183	CB#187	CB#194	CB#28	CB#31	CB#44	CB#47	CB#49	CB#52	CB#66
173	Third Party	2001/01402	2001	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0003	0.0003	0.0002	0.0000	0.0002	0.0004	0.0005
174	Third Party	2001/01403	2001	0.0005	0.0005	0.0012	0.0003	0.0007	0.0002	0.0013	0.0007	0.0006	0.0002	0.0012	0.0010	0.0015
176	ABP	2001/01406	2001	0.0000	0.0000	0.0004	0.0000	0.0000	0.0000	0.0004	0.0003	0.0002	0.0000	0.0003	0.0004	0.0004
185	Third Party	2001/00350	2001	0.0013	0.0002	0.0024	0.0006	0.0011	0.0004	0.0013	0.0007	0.0007	0.0003	0.0007	0.0011	0.0014
186	Third Party	2001/00351	2001	0.0012	0.0000	0.0020	0.0005	0.0010	0.0004	0.0010	0.0005	0.0005	0.0000	0.0006	0.0007	0.0012
187	Third Party	2001/00352	2001	0.0010	0.0000	0.0017	0.0004	0.0008	0.0003	0.0009	0.0005	0.0004	0.0000	0.0004	0.0006	0.0010
188	Third Party	2001/00353	2001	0.0010	0.0000	0.0021	0.0005	0.0011	0.0003	0.0010	0.0005	0.0006	0.0000	0.0050	0.0007	0.0015
189	Third Party	2001/00354	2001	0.0003	0.0000	0.0010	0.0000	0.0005	0.0000	0.0012	0.0007	0.0006	0.0000	0.0012	0.0008	0.0010
190	Third Party	2001/00355	2001	0.0004	0.0000	0.0010	0.0000	0.0005	0.0000	0.0008	0.0004	0.0004	0.0000	0.0004	0.0005	0.0010
191	Third Party	2001/00356	2001	0.0005	0.0000	0.0013	0.0003	0.0007	0.0000	0.0006	0.0000	0.0004	0.0000	0.0004	0.0005	0.0009
192	Third Party	2001/00357	2001	0.0003	0.0000	0.0010	0.0000	0.0005	0.0000	0.0009	0.0005	0.0005	0.0000	0.0000	0.0006	0.0008
193	Third Party	2001/00358	2001	0.0006	0.0000	0.0140	0.0003	0.0007	0.0000	0.0009	0.0050	0.0006	0.0000	0.0005	0.0008	0.0012
194	Third Party	2001/00359	2001	0.0004	0.0000	0.0010	0.0000	0.0005	0.0000	0.0009	0.0005	0.0005	0.0000	0.0006	0.0005	0.0008
135	Third Party	2004/02498	2004	0.0002	0.0200	0.0002	0.0002	0.0002	0.0003	0.0230	0.0230	0.0100	0.0034	0.0100	0.0110	0.0002
136	Third Party	2004/02499	2004	0.0019	0.0120	0.0036	0.0009	0.0018	0.0009	0.0180	0.0150	0.0087	0.0016	0.0096	0.0110	0.0110
137	Third Party	2004/02500	2004	0.0002	0.0210	0.0002	0.0002	0.0002	0.0002	0.0210	0.0210	0.0002	0.0027	0.0083	0.0090	0.0002
138	ABP	2004/02522	2004	0.0002	0.0002	0.0006	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002	0.0002	0.0009	0.0003	0.0004
139	Third Party	2004/02523	2004	0.0004	0.0002	0.0009	0.0002	0.0005	0.0002	0.0005	0.0003	0.0003	0.0002	0.0009	0.0005	0.0005
140	Third Party	2004/02524	2004	0.0002	0.0005	0.0005	0.0002	0.0003	0.0002	0.0008	0.0006	0.0004	0.0002	0.0012	0.0006	0.0005
141	Third Party	2004/02525	2004	0.0003	0.0002	0.0007	0.0002	0.0004	0.0002	0.0004	0.0003	0.0003	0.0002	0.0003	0.0005	0.0005
142	ABP	2004/02526	2004	0.0003	0.0003	0.0008	0.0002	0.0004	0.0002	0.0005	0.0004	0.0004	0.0002	0.0007	0.0006	0.0006
80	ABP	2007/02179	2007	0.0003	0.0002	0.0005	0.0002	0.0002	0.0002	0.0005	0.0004	0.0003	0.0002	0.0003	0.0003	0.0005
81	ABP	2007/02180	2007	0.0006	0.0003	0.0012	0.0003	0.0006	0.0003	0.0007	0.0005	0.0004	0.0003	0.0005	0.0006	0.0007
82	Third Party	2007/02181	2007	0.0004	0.0003	0.0007	0.0002	0.0004	0.0002	0.0006	0.0005	0.0004	0.0003	0.0004	0.0005	0.0005
83	Third Party	2007/02182	2007	0.0004	0.0011	0.0007	0.0002	0.0004	0.0002	0.0013	0.0011	0.0008	0.0004	0.0011	0.0011	0.0009

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#170	CB#18	CB#180	CB#183	CB#187	CB#194	CB#28	CB#31	CB#44	CB#47	CB#49	CB#52	CB#66
84	Third Party	2007/02183	2007	0.0006	0.0008	0.0012	0.0003	0.0007	0.0003	0.0010	0.0009	0.0007	0.0004	0.0008	0.0009	0.0009
85	ABP	2007/02184	2007	0.0003	0.0002	0.0005	0.0002	0.0003	0.0002	0.0005	0.0005	0.0003	0.0002	0.0003	0.0003	0.0005
57	ABP	2008/00301	2008	0.0002	0.0002	0.0002	0.0002	0.0007	0.0002	0.0003	0.0003	0.0002	0.0002	0.0002	0.0003	0.0002
70	ABP	2008/01556	2008	0.0062	0.0006	0.0100	0.0027	0.0041	0.0013	0.0010	0.0009	0.0008	0.0003	0.0009	0.0014	0.0002
72	ABP	2008/01558	2008	0.0002	0.0045	0.0002	0.0002	0.0002	0.0002	0.0048	0.0048	0.0019	0.0007	0.0022	0.0019	0.0013
13	ABP	2009/00785	2009	0.0002	0.0003	0.0003	0.0002	0.0003	0.0002	0.0005	0.0004	0.0003	0.0002	0.0003	0.0004	0.0003
15	ABP	2009/00787	2009	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0004	0.0003	0.0002	0.0002	0.0004	0.0003	0.0003
17	ABP	2009/00789	2009	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002	0.0007	0.0006	0.0003	0.0002	0.0004	0.0005	0.0003
20	ABP	2009/00792	2009	0.0002	0.0003	0.0003	0.0002	0.0002	0.0002	0.0006	0.0005	0.0003	0.0002	0.0005	0.0005	0.0004
23	ABP	2009/00797	2009	0.0003	0.0015	0.0007	0.0002	0.0005	0.0003	0.0023	0.0021	0.0009	0.0005	0.0012	0.0014	0.0006
48	ABP	2009/01605	2009	0.0041	0.0016	0.0084	0.0017	0.0046	0.0019	0.0025	0.0017	0.0016	0.0008	0.0021	0.0028	0.0027
52	ABP	2009/01610	2009	0.0009	0.0015	0.0017	0.0003	0.0010	0.0005	0.0022	0.0014	0.0012	0.0006	0.0015	0.0017	0.0012
53	ABP	2009/01611	2009	0.0130	0.0029	0.0331	0.0053	0.0130	0.0051	0.0052	0.0040	0.0099	0.0043	0.0190	0.0475	0.0389
281	ABP	2012/0645/01	2012	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
282	ABP	2012/0646/01	2012	0.0002	0.00058	0.00023	0.0002	0.0002	0.0002	0.00059	0.00054	0.0003	0.0002	0.00039	0.0005	0.0003
283	ABP	2012/0647/01	2012	0.0002	0.00054	0.00023	0.0002	0.0002	0.0002	0.00061	0.00057	0.0003	0.0002	0.0004	0.00055	0.0003
296	Third Party	2012/01679	2012	0.00026	0.00028	0.00079	0.00021	0.00063	0.00042	0.00042	0.00029	0.0003	0.0002	0.00042	0.00056	0.0004
297	Third Party	2012/01680	2012	0.0002	0.00022	0.00043	0.0002	0.0003	0.0002	0.00036	0.00024	0.0003	0.0002	0.00038	0.0005	0.0004
10	ABP	4469705	2019	0.000087	0.00045	0.0002	<LOD	0.00016	<LOD	0.00097	0.00079	0.00038	0.00025	0.00044	0.00058	0.00046
9	ABP	4469706	2019	0.000098	0.00047	0.00024	<LOD	0.00013	<LOD	0.00072	0.00063	0.00031	0.0002	0.00036	0.00046	0.0003
8	ABP	4469707	2019	<LOD	0.00066	0.00017	<LOD	0.00011	<LOD	0.00082	0.00078	0.00031	0.0002	0.00038	0.00048	0.00036
12	ABP	4469708	2019	<LOD	0.00073	<LOD	<LOD	<LOD	<LOD	0.00052	0.0005	0.00016	0.000096	0.00017	0.00022	0.00009
13	ABP	4469709	2019	<LOD	0.0013	<LOD	<LOD	<LOD	<LOD	0.00076	0.00096	0.00024	0.00019	0.00037	0.0005	0.00021
14	ABP	4469710	2019	<LOD	0.0035	0.0001	<LOD	<LOD	<LOD	0.0019	0.0024	0.00069	0.00036	0.00083	0.0013	0.0004
7	ABP	4469711	2019	<LOD	0.00032	0.00014	<LOD	0.0001	<LOD	0.00041	0.00038	0.00018	0.00013	0.00021	0.00029	0.00021
6	ABP	4469712	2019	<LOD	<LOD	0.00011	<LOD	<LOD	<LOD	0.00019	0.00014	0.000095	<LOD	0.00012	0.00014	0.00012
5	ABP	4469713	2019	<LOD	0.00011	0.00018	<LOD	0.000094	<LOD	0.00025	0.00018	0.00011	0.00011	0.00013	0.00017	0.00015
11	ABP	4469714	2019	0.00097	0.00022	0.0044	0.0012	0.0029	0.0016	0.00038	0.00031	0.00026	0.0002	0.00039	0.00053	0.00035

Table A7. River Test Berths and Channel – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	TOT25 CBS	TOT ICES7	AHCH	GHCH	HCB	DIELDRIN	PPDDE	PPDDT	PPTDE
173	Third Party	2001/01402	2001	0.0052	0.0030	0.0003	0.0003	0.0000	0.0015	0.0000	0.0035	0.0010
174	Third Party	2001/01403	2001	0.0218	0.0099	0.0000	0.0003	0.0005	0.0009	0.0007	0.0044	0.0012
176	ABP	2001/01406	2001	0.0057	0.0029	0.0000	0.0004	0.0002	0.0016	0.0004	0.0000	0.0009
185	Third Party	2001/00350	2001	0.0313	0.0143	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
186	Third Party	2001/00351	2001	0.0262	0.0118	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
187	Third Party	2001/00352	2001	0.0224	0.0103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
188	Third Party	2001/00353	2001	0.0333	0.0140	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
189	Third Party	2001/00354	2001	0.0170	0.0087	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
190	Third Party	2001/00355	2001	0.0151	0.0079	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
191	Third Party	2001/00356	2001	0.0161	0.0082	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
192	Third Party	2001/00357	2001	0.0129	0.0072	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
193	Third Party	2001/00358	2001	0.0381	0.0228	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
194	Third Party	2001/00359	2001	0.0146	0.0076	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
135	Third Party	2004/02498	2004	0.1091	0.0376	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
136	Third Party	2004/02499	2004	0.1561	0.0661	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
137	Third Party	2004/02500	2004	0.0904	0.0325	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
138	ABP	2004/02522	2004	0.0098	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
139	Third Party	2004/02523	2004	0.0127	0.0058	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
140	Third Party	2004/02524	2004	0.0119	0.0050	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
141	Third Party	2004/02525	2004	0.0107	0.0051	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	TOT25 CBS	TOT ICES7	AHCH	GHCH	HCB	DIELDRIN	PPDDE	PPDDT	PPTDE
142	ABP	2004/02526	2004	0.0132	0.0062	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
80	ABP	2007/02179	2007	0.0095	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
81	ABP	2007/02180	2007	0.0163	0.0072	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
82	Third Party	2007/02181	2007	0.0127	0.0054	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
83	Third Party	2007/02182	2007	0.0179	0.0073	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
84	Third Party	2007/02183	2007	0.0207	0.0091	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
85	ABP	2007/02184	2007	0.0100	0.0039	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
57	ABP	2008/00301	2008	0.0058	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
70	ABP	2008/01556	2008	0.0951	0.0486	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
72	ABP	2008/01558	2008	0.0277	0.0091	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
13	ABP	2009/00785	2009	0.0079	0.0031	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
15	ABP	2009/00787	2009	0.0062	0.0018	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
17	ABP	2009/00789	2009	0.0078	0.0025	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
20	ABP	2009/00792	2009	0.0095	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
23	ABP	2009/00797	2009	0.0192	0.0081	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
48	ABP	2009/01605	2009	0.0845	0.0410	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
52	ABP	2009/01610	2009	0.0315	0.0146	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
53	ABP	2009/01611	2009	0.6849	0.3566	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
281	ABP	2012/0645/01	2012	0.0050	0.0002	0.0000	0.0000	0.0002	0.0003	0.0000	0.0000	0.0000
282	ABP	2012/0646/01	2012	0.0080	0.0029	0.0000	0.0000	0.0004	0.0004	0.0000	0.0000	0.0000
283	ABP	2012/0647/01	2012	0.0083	0.0031	0.0000	0.0000	0.0008	0.0004	0.0000	0.0000	0.0000
296	Third Party	2012/01679	2012	0.0119	0.0055	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
297	Third Party	2012/01680	2012	0.0102	0.0047	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10	ABP	4469705.00	2019	0.0081	0.0038							
9	ABP	4469706.00	2019	0.0066	0.0028							
8	ABP	4469707.00	2019	0.0063	0.0028							
12	ABP	4469708.00	2019	0.0025	0.0007							
13	ABP	4469709.00	2019	0.0046	0.0013							
14	ABP	4469710.00	2019	0.0134	0.0044							
7	ABP	4469711.00	2019	0.0037	0.0018							
6	ABP	4469712.00	2019	0.0022	0.0013							
5	ABP	4469713.00	2019	0.0028	0.0015							
11	ABP	4469714.00	2019	0.0223	0.0099							

A.2.4 River Itchen berths and channel – Metals and tin results

Table A8. River Itchen Berths and Channel – Metals and Tin Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
153	Third Party	2001/00033	2001	5.1	0.04	11	8.5	8.9	0.04	6.4	23	0.0470	0.0770
154	Third Party	2001/00034	2001	8.4	0.06	17	12	11	0.06	11	32	0.0420	0.1440
155	Third Party	2001/00035	2001	6.1	0.04	10	8.8	8.8	0.04	5.3	24	0.0340	0.0960
156	Third Party	2001/00036	2001	8.9	0.05	13	11	11	0.05	6.9	31	0.0370	0.1230
157	Third Party	2001/00037	2001	4.3	0.05	14	13	12	0.06	7	33	0.0360	0.1190
177	Third Party	2001/01596	2001	0	0	0	0	0	0	0	0	0.0440	0.1530
178	Third Party	2001/01598	2001	0	0	0	0	0	0	0	0	0.0510	0.2040
208	Third Party	2001/01594	2001	0	0	0	0	0	0	0	0	0.0010	0.0010
209	Third Party	2001/01595	2001	0	0	0	0	0	0	0	0	0.0700	0.2070
210	Third Party	2001/01597	2001	0	0	0	0	0	0	0	0	0.0380	0.1210
125	Third Party	2004/02232	2004	0	0	0	0	0	0	0	0	0.0685	0.0196
126	ABP	2004/02233	2004	7.6	0.05	20	20	18	0.07	9.8	47	0.0653	0.1828

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
92	Third Party	2005/00983	2005	27	0.09	32	7.9	14	0.04	20	47	0.0020	0.0020
93	Third Party	2005/00985	2005	33	0.1	37	9.3	16	0.07	23	51	0.0020	0.0020
94	Third Party	2005/00986	2005	19	0.11	21	7	11	0.01	17	46	0.0020	0.0020
95	ABP	2005/01395	2005	21	0.12	48	49	37	0.16	24	116	0.0228	0.0791
96	ABP	2005/01396	2005	20	0.11	39	42	31	0.16	20	97	0.0237	0.0517
97	ABP	2005/01397	2005	30	0.12	67	60	49	0.11	32	150	0.0241	0.0588
98	ABP	2005/01398	2005	24	0.14	56	55	44	0.13	27	128	0.0306	0.0733
99	ABP	2005/01399	2005	0	0	0	0	0	0	0	0	0.0000	0.0000
114	Third Party	2005/05728	2005	30	0.12	32	77	55	0.06	29	168	0.0460	0.0769
115	Third Party	2005/05729	2005	24	0.15	28	75	52	0.03	26	165	0.0593	0.0853
116	Third Party	2005/05730	2005	24	0.16	31	73	55	0.11	25	155	0.0656	0.0935
117	Third Party	2005/05732	2005	22	0.44	27	131	107	0.54	34	372	0.1947	0.2196
118	Third Party	2005/05733	2005	24	0.46	27	107	95	0.31	34	323	0.2364	0.1493
119	Third Party	2005/05734	2005	18	0.52	30	109	104	0.12	30	282	0.2994	0.1638
120	Third Party	2005/05735	2005	19	0.51	30	110	100	0.29	30	287	0.3280	0.2339
121	Third Party	2005/05737	2005	14	0.23	20	62	73	0.36	21	179	0.0832	0.1482
122	Third Party	2005/05738	2005	19	0.39	32	101	92	0.94	28	249	0.1886	0.2042
123	Third Party	2005/05739	2005	17	0.5	23	108	100	0.31	25	267	0.2455	0.2462
124	Third Party	2005/05015	2005	28	0.12	31	9.4	15	0.01	19	55	0.0000	0.0000
60	ABP	2008/01546	2008	18	0.16	30	47	38	0.2	18	119	0.0325	0.0668
62	ABP	2008/01548	2008	19	0.11	22	28	30	0.18	16	79	0.0117	0.0409
63	ABP	2008/01549	2008	19	0.13	22	43	37	0.24	16	97	0.0272	0.0509
74	ABP	2008/01677	2008	23	0.06	44	56	45	0.24	26	136	0.0261	0.0735
75	Third Party	2008/01678	2008	23	0.05	36	62	49	0.26	25	138	0.0569	0.0664
76	Third Party	2008/01679	2008	24	0.06	44	60	49	0.4	28	144	0.0364	0.0434
77	Third Party	2008/01808	2008	21	0.43	45	78	151	0.78	26	195	0.0452	0.0873
78	Third Party	2008/01809	2008	19	0.58	42	142	127	1	24	232	0.0612	0.1746
79	Third Party	2008/01810	2008	19	0.53	38	82	80	0.54	22	206	0.0812	0.0919
6	Third Party	2009/00235	2009	26	0.08	18	7.1	13	0.05	14	40	0.0060	0.1060
7	Third Party	2009/00236	2009	24	0.07	15	6.4	12	0.03	13	34	0.0020	0.0030
8	Third Party	2009/00237	2009	26	0.14	17	6.6	12	0.02	13	39	0.0010	0.0010
179	Third Party	2011/00168	2011	11	0.31	47	75	86	2.6	18	221	0.0733	0.0984
180	Third Party	2011/00169	2011	12	0.35	36	103	867	0.76	22	225	0.0548	0.0983
181	Third Party	2011/00170	2011	8.2	0.27	35	119	315	0.41	28	122	0.0462	0.0554
211	ABP	2011/01108	2011	21	0.16	37	69	40	0.18	22	127	0.0220	0.0410
213	ABP	2011/01110	2011	20	0.12	37	31	53	0.16	21	100	0.0020	0.0319
214	ABP	2011/01111	2011	20	0.11	31	37	36	0.2	19	98	0.0217	0.0416
227	Third Party	2011/02730	2011	16	0.41	43	74	72	0.28	25	192	0.0631	0.0770
228	Third Party	2011/02731	2011	14	0.31	37	80	68	0.46	23	213	0.0751	0.0761
229	Third Party	2011/02732	2011	16	0.64	44	95	104	1	26	242	0.0751	0.2503
230	Third Party	2011/02733	2011	17	0.55	48	164	100	0.52	29	409	0.1019	0.1411
231	Third Party	2011/02734	2011	14	0.28	31	106	178	3.4	21	212	0.0517	0.0954
232	Third Party	2011/02735	2011	15	0.37	42	103	80	0.37	27	243	0.1154	0.1886
233	Third Party	2011/02736	2011	13	0.35	41	171	483	0.63	26	367	0.0795	0.5465
237	Third Party	2011/03026	2011	25	0.21	44	68	47	0.26	26	142	0.0000	0.0000
238	Third Party	2011/03027	2011	20	0.18	41	64	46	0.24	24	137	0.0000	0.0000
239	Third Party	2011/03028	2011	26	0.2	39	74	49	0.53	24	148	0.0000	0.0000
240	Third Party	2011/03029	2011	0	0	0	0	0	0	0	0	0.0282	0.0535
278	Third Party	2012/00584	2012	24	0.15	20	17	47	0.32	17	71	0.0000	0.0000
279	Third Party	2012/00585	2012	20	0.1	15	13	30	0.22	15	57	0.0000	0.0000
280	Third Party	2012/00586	2012	13	0.05	12	9.9	15	0.07	9.5	37	0.0000	0.0000
307	Third Party	2013/00031	2013	18	0.15	22	36	29	0.15	16	79	0.0110	0.0170
308	Third Party	2013/00034	2013	18	0.12	28	22	23	0.1	16	72	0.0000	0.0000

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
316	Third Party	2015/21862	2015	19.62	0.29	53	41.22	40.27	0.14	25.39	124.92	0.0136	0.0283
317	Third Party	2015/21863	2015	25.12	0.23	57.73	38.79	39.54	0.12	27.22	123.68	0.0000	0.0282
318	Third Party	2015/21863	2015	25.12	0.23	57.73	38.79	39.54	0.12	27.22	123.68	0.0000	0.0282
319	Third Party	2015/00014	2015	19.5	0.65	46.99	94.53	92.02	0.44	26	255.85	0.0646	0.5067
320	Third Party	2015/00014	2015	19.49	0.42	65.59	109.41	99.26	0.42	32.11	219.84	0.0266	0.0717
321	Third Party	2015/00014	2015	14.75	0.46	45.41	79.43	78.19	0.38	22.34	175.86	0.0445	0.1995
349	ABP	2016/442798-109636	2016	19.3	0.129	62.2	39.8	39.4	0.096	25	111	0.0000	0.0000
350	ABP	2016/442559-110277	2016	19.9	0.18	67.3	42.8	37.8	0.112	27.5	123	0.0000	0.0000
351	ABP	2016/442886-110166.9	2016	21.8	0.135	67.7	35.8	37.4	0.0889	28	118	0.0000	0.0000
3	ABP	4469716	2019	16	0.11	49	29	31	0.11	21	92	0.0039	0.0073
4	ABP	4469717	2019	17	0.15	57	38	37	0.14	24	120	0.0050	0.0100
1	ABP	4469718	2019	14	0.14	47	37	31	0.13	20	100	0.0056	0.0120
12	ABP	MAR01485.012	2022	17.7	0.1	29.8	30.8	29.8	0.14	20	87.4		
13	ABP	MAR01485.013	2022	16.1	0.1	28	39.4	33.1	0.15	18.8	94.8		
14	ABP	MAR01485.014	2022	17.9	0.25	26	33.3	27.1	0.11	20.2	87.8		

A.2.5 River Itchen berths and channel – Polycyclic aromatic hydrocarbon results

Table A9. River Itchen Berths and Channel – Polycyclic Aromatic Hydrocarbon Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	23BA	ACENAPH	ACENAPT	ANTHRAC	BAA	BAP	BBF	BENZGHI	BEP	BKF	C1N	C1PHEN
125	Third Party	2004/02232	2004	0.0000	0.0230	0.0220	0.1480	1.2730	1.6840	1.7020	0.5740	1.0950	0.7470	0.0100	0.3000
126	ABP	2004/02233	2004	0.0000	0.0100	0.0110	0.0530	0.3170	0.5210	0.5660	0.1930	0.3720	0.2290	0.0420	0.1900
99	ABP	2005/01399	2005	0.0000	0.0053	0.0280	0.0380	0.1520	0.2190	0.3550	0.1210	0.1710	0.1170	0.0330	0.1540
60	ABP	2008/01546	2008	0.0000	0.0062	0.0270	0.0600	0.1270	0.2350	0.3320	0.1330	0.1520	0.1340	0.0440	0.0180
62	ABP	2008/01548	2008	0.0000	0.0069	0.0180	0.0540	0.0990	0.1560	0.2820	0.1010	0.1150	0.0880	0.0600	0.2170
63	ABP	2008/01549	2008	0.0000	0.0078	0.0140	0.0830	0.1210	0.2090	0.3460	0.1240	0.1640	0.1190	0.0430	0.1490
179	Third Party	2011/00168	2011	0.0000	0.0370	0.0529	0.3029	0.9725	1.0425	1.2489	0.7364	0.6380	0.5858	0.1363	0.7434
180	Third Party	2011/00169	2011	0.0000	0.0504	0.0775	0.3973	1.9250	2.2201	2.1224	1.2783	1.2801	1.1540	0.5601	1.5829
181	Third Party	2011/00170	2011	0.0000	0.0131	0.0404	0.0797	0.4021	0.4554	0.5781	0.3593	0.3150	0.2779	0.0692	0.3079
211	ABP	2011/01108	2011	0.0000	0.0099	0.0107	0.0264	0.1183	0.1947	0.2674	0.1815	0.1530	0.1368	0.0395	0.1333
213	ABP	2011/01110	2011	0.0000	0.0116	0.0104	0.0301	0.1349	0.2138	0.2227	0.1558	0.1428	0.1269	0.0388	0.1464
214	ABP	2011/01111	2011	0.0000	0.0083	0.0079	0.0297	0.1252	0.1803	0.2736	0.1549	0.1412	0.1247	0.0338	0.1505
307	Third Party	2013/00031	2013	0.0000	0.006	0.008	0.059	0.097	0.115	0.168	0.085	0.092	0.062	0.033	0.595
308	Third Party	2013/00034	2013	0.0000	0.003	0.004	0.018	0.047	0.053	0.087	0.055	0.044	0.038	0.022	0.103
316	Third Party	2015/21862	2015	0.0158	0.0101	0.0595	0.23	0.284	0.266	0.209	0.211	0.133	0.0396	0.212	0.0844
317	Third Party	2015/21863	2015	0.022	0.0211	0.0584	0.298	0.338	0.27	0.222	0.236	0.149	0.0559	0.27	0.0976
318	Third Party	2015/21863	2015	0.022	0.0211	0.0584	0.298	0.338	0.27	0.222	0.236	0.149	0.0559	0.27	0.0976
3	ABP	4469716	2019		<LOD	<LOD	20.0000	83.0000	110.0000	110.0000	86.0000	92.0000	55.0000	31.0000	120.0000
4	ABP	4469717	2019		<LOD	12.0000	25.0000	130.0000	190.0000	180.0000	150.0000	150.0000	90.0000	40.0000	120.0000
1	ABP	4469718	2019		<LOD	<LOD	18.0000	88.0000	140.0000	140.0000	120.0000	110.0000	70.0000	34.0000	110.0000

Table A10. River Itchen Berths and Channel – Polycyclic Aromatic Hydrocarbon Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	C2N	C3N	CHRYSEN	DBENZAH	FLUORAN	FLUOREN	INDPYR	NAPTH	PERYLEN	PHENANT	PYRENE	THC
125	Third Party	2004/02232	2004	0.0680	0.5150	1.2260	0.1320	2.1860	0.1730	0.6400	0.0560	0.4890	0.3480	1.8200	805
126	ABP	2004/02233	2004	0.0600	0.1630	0.3110	0.0400	0.6020	0.0210	0.2100	0.0360	0.2860	0.1270	0.7030	459
99	ABP	2005/01399	2005	0.0590	0.1620	0.1670	0.0370	0.2960	0.0110	0.1490	0.0180	0.1850	0.0730	0.3290	368
60	ABP	2008/01546	2008	0.0860	0.2020	0.1430	0.0420	0.3070	0.0290	0.1400	0.0530	0.1360	0.1150	0.3980	371
62	ABP	2008/01548	2008	0.1260	0.2520	0.0860	0.0280	0.2220	0.0200	0.1000	0.0340	0.1400	0.0990	0.2590	254
63	ABP	2008/01549	2008	0.0830	0.1620	0.1220	0.0310	0.2950	0.0170	0.1410	0.0270	0.2020	0.1120	0.3170	321
179	Third Party	2011/00168	2011	0.2515	0.4913	0.7630	0.1590	2.0721	0.0866	0.8248	0.1226	0.3795	0.7143	1.6809	769
180	Third Party	2011/00169	2011	1.1173	1.6476	1.6077	0.3309	4.0976	0.1402	1.5507	0.2222	0.6824	1.2107	3.6592	1282
181	Third Party	2011/00170	2011	0.1901	0.3639	0.3341	0.0745	0.7970	0.0420	0.3953	0.0424	0.1914	0.2841	0.7000	466
211	ABP	2011/01108	2011	0.0752	0.1355	0.0777	0.0288	0.2513	0.0134	0.2099	0.0225	0.1902	0.0560	0.3023	501
213	ABP	2011/01110	2011	0.0664	0.1533	0.1033	0.0271	0.2608	0.0130	0.1852	0.0256	0.1663	0.0479	0.2726	419
214	ABP	2011/01111	2011	0.0657	0.1459	0.0835	0.0272	0.2608	0.0109	0.1855	0.0186	0.1770	0.0508	0.2571	441
307	Third Party	2013/00031	2013	0.141	1.455	0.067	0.02	0.267	0.016	0.098	0.014	0.172	0.071	0.2570	538
308	Third Party	2013/00034	2013	0.048	0.136	0.028	0.01	0.091	0.005	0.055	0.01	0.111	0.032	0.1080	308
316	Third Party	2015/21862	2015	0.161	0.193	0.0518	0.42	0.0145	0.252	0.0283	0.129	0.118	0.423	0.0000	0
317	Third Party	2015/21863	2015	0.187	0.273	0.061	0.474	0.0189	0.272	0.044	0.14	0.122	0.458	0.0000	0
318	Third Party	2015/21863	2015	0.187	0.273	0.061	0.474	0.0189	0.272	0.044	0.14	0.122	0.458	0.0000	0
349	ABP	2016/442798-109636	2016												439
350	ABP	2016/442559-110277	2016												457
351	ABP	2016/442886-110166.9	2016												374
3	ABP	4469716	2019	31	59	71	17	180	<LOD	75	25	100	38	220.0000	350
4	ABP	4469717	2019	41	57	100	27	230	<LOD	120	89	130	62	270.0000	360
1	ABP	4469718	2019	33	50	71	20	150	<LOD	98	<LOD	120	52	210.0000	360
12	ABP	MAR01485.012	2022												18
13	ABP	MAR01485.013	2022												28
14	ABP	MAR01485.014	2022												320

A.2.6 River Itchen berths and channel – Polychlorinated biphenyl results

Table A11. River Itchen Berths and Channel – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#101	CB#105	CB#110	CB#118	CB#128	CB#138	CB#141	CB#149	CB#151	CB#153	CB#156	CB#158
63	ABP	2008/01549	2008	0.0005	0.0003	0.0009	0.0008	0.0002	0.0009	0.0002	0.0006	0.0002	0.0008	0.0002	0.0002
179	Third Party	2011/00168	2011	0.0024	0.0010	0.0026	0.0024	0.0006	0.0028	0.0004	0.0019	0.0005	0.0025	0.0004	0.0003
180	Third Party	2011/00169	2011	0.0020	0.0009	0.0022	0.0020	0.0005	0.0025	0.0004	0.0018	0.0005	0.0022	0.0003	0.0003
181	Third Party	2011/00170	2011	0.0019	0.0009	0.0020	0.0019	0.0005	0.0021	0.0003	0.0014	0.0004	0.0019	0.0003	0.0002
3	ABP	4469716	2019	0.00016	<LOD	0.00019	0.00018	<LOD	0.00023	<LOD	0.00018	<LOD	0.00029	<LOD	<LOD
4	ABP	4469717	2019	0.0005	0.00017	0.00045	0.00043	0.00013	0.00067	0.00008	0.00042	0.00011	0.00066	0.00	<LOD
1	ABP	4469718	2019	0.00061	<LOD	0.0006	0.00046	0.00018	0.00075	0.00011	0.00049	<LOD	0.00074	0.0001	<LOD

Table A12. River Itchen Berths and Channel – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#170	CB#18	CB#180	CB#183	CB#187	CB#194	CB#28	CB#31	CB#44	CB#47	CB#49	CB#52	CB#66
63	ABP	2008/01549	2008	0.0003	0.0003	0.0005	0.0002	0.0003	0.0002	0.0005	0.0004	0.0004	0.0002	0.0005	0.0004	0.0004
179	Third Party	2011/00168	2011	0.0006	0.0022	0.0012	0.0002	0.0005	0.0003	0.0035	0.0026	0.0015	0.0005	0.0014	0.0022	0.0019
180	Third Party	2011/00169	2011	0.0006	0.0013	0.0011	0.0002	0.0004	0.0003	0.0022	0.0017	0.0010	0.0002	0.0009	0.0018	0.0012
181	Third Party	2011/00170	2011	0.0005	0.0012	0.0009	0.0002	0.0004	0.0002	0.0019	0.0015	0.0010	0.0004	0.0009	0.0015	0.0013
3	ABP	4469716	2019	<LOD	<LOD	0.00014	<LOD	0.000085	<LOD	0.00015	0.00011	0.000091	<LOD	0.000095	0.00013	0.000098
4	ABP	4469717	2019	0.00014	<LOD	0.00037	<LOD	0.00016	<LOD	0.00035	0.00021	0.00022	0.00013	0.00021	0.0003	0.00028
1	ABP	4469718	2019	0.00015	0.00014	0.00036	<LOD	0.00023	<LOD	0.00036	0.00025	0.00028	0.00015	0.00029	0.00041	0.00032

Table A13 River Itchen Berths and Channel – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	TOT25CBS	TOTICES7	AHCH	GHCH	HCB	DIELDRIN	PPDDE	PPDDT	PPTDE
63	ABP	2008/01549	2008	0.0091	0.0044	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
179	Third Party	2011/00168	2011	0.0360	0.0170	0.0000	0.0000	0.0003	0.0000	0.0012	0.0000	0.0000
180	Third Party	2011/00169	2011	0.0279	0.0138	0.0000	0.0000	0.0002	0.0000	0.0009	0.0000	0.0000
181	Third Party	2011/00170	2011	0.0252	0.0121	0.0000	0.0000	0.0002	0.0000	0.0008	0.0000	0.0000
3	ABP	4469716	2019	0.0021	0.0013							
4	ABP	4469717	2019	0.0061	0.0033							
1	ABP	4469718	2019	0.0070	0.0037							

A.2.7 Southampton Water – Metals and tin results

Table A14. Southampton Water – Metals and Tin Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
158	Third Party	2001/00040	2001	4.6	0.03	13	19	13	0.08	7.8	46	0.0470	0.1740
168	ABP	2001/01395	2001	18	0.04	26	15	35	1.1	7.1	61	0.0130	0.0450
169	Third Party	2001/01396	2001	15	0.14	54	47	58	0.26	23	120	0.0020	0.0050
170	Third Party	2001/01397	2001	28	0.17	65	71	68	0.33	26	145	0.0010	0.0020
175	ABP	2001/01404	2001	5.3	0.07	22	17	14	0.15	9.2	48	0.0240	0.0510
183	Third Party	2001/00038	2001	15	0.08	21	28	19	0.18	10	54	0.0520	0.1690
184	Third Party	2001/00039	2001	19	0.22	28	56	49	0.36	14	75	0.0280	0.0580
195	ABP	2001/01376	2001	8.2	0.07	29	13	13	0.05	13	43	0.0240	0.1630
196	Third Party	2001/01377	2001	7.5	0.08	23	19	16	2.8	7.6	46	0.0160	0.0510
197	ABP	2001/01378	2001	5.5	0.05	16	8.2	13	0.15	5.3	33	0.0110	0.0550
198	Third Party	2001/01379	2001	8	0.12	21	26	13	0.17	9.3	57	0.0280	0.0670
199	ABP	2001/01380	2001	7.9	0.07	30	17	16	0.07	13	51	0.0350	0.1490
200	ABP	2001/01381	2001	6.9	0.09	23	16	17	0.1	8.4	54	0.0190	0.0580
207	ABP	2001/01405	2001	5.8	0.05	29	14	10	0.06	12	45	0.0250	0.1180
224	Third Party	2001/03627	2001	7.3	0.11	25	78	32	0.15	12	97	0.0660	0.1520
225	Third Party	2001/03628	2001	7.5	0.07	25	31	20	0.13	11	56	0.0510	0.1530
226	Third Party	2001/03629	2001	6.2	0.06	20	27	16	0.09	8.8	47	0.0430	0.1120
127	Third Party	2004/09750	2004	18	0.19	35	124	56	0.29	20	140	0.0615	0.1260
129	Third Party	2004/09752	2004	18	0.22	31	178	74	0.61	21	207	0.0604	0.0983
131	Third Party	2004/09754	2004	17	0.19	27	73	39	0.29	19	99	0.0428	0.0994
133	Third Party	2004/09756	2004	0	0	0	0	0	0	0	0	0.0000	0.0000
143	ABP	2004/02527	2004	8	0.06	20	17	17	0.07	8.6	38	0.0213	0.0638
144	ABP	2004/02528	2004	10	0.06	20	16	16	0.06	9.5	38	0.0023	0.0452
145	ABP	2004/02529	2004	9.5	0.05	21	17	16	0.06	9.4	36	0.0204	0.0553
146	ABP	2004/02530	2004	9.2	0.06	17	17	19	0.08	8.6	43	0.0197	0.0443
147	Third Party	2004/11695	2004	25	0.19	55	88	49	0.42	29	126	0.0434	0.1041

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
148	Third Party	2004/11696	2004	22	0.15	54	82	44	0.19	27	118	0.0387	0.1069
149	Third Party	2004/11697	2004	24	0.18	57	88	47	0.08	28	129	0.0526	0.1143
150	Third Party	2004/11698	2004	22	0.14	54	84	46	0.06	27	120	0.0466	0.1220
151	Third Party	2004/11699	2004	23	0.16	49	82	46	0.03	26	124	0.0438	0.1126
152	Third Party	2004/11700	2004	21	0.15	43	78	44	0.02	24	115	0.0356	0.1044
107	ABP	2005/01407	2005	17	0.09	35	33	24	0.05	19	85	0.0020	0.0591
108	ABP	2005/01408	2005	18	0.09	33	40	25	0.03	19	86	0.0207	0.0704
109	ABP	2005/01409	2005	18	0.09	34	33	24	0.03	19	83	0.0020	0.0481
110	ABP	2005/01411	2005	0	0	0	0	0	0	0	0	0.0000	0.0000
268	ABP	2005/01410	2005	18	0.06	25	21	19	0.01	14	68	0.0020	0.0234
269	Third Party	2005/03724	2005	23	0.09	30	30	29	0.13	22	78	0.0010	0.0344
270	ABP	2005/03725	2005	24	0.09	29	30	30	0.24	21	74	0.0020	0.0275
271	ABP	2005/03726	2005	21	0.08	26	28	28	0.11	20	72	0.0020	0.0406
272	ABP	2005/03727	2005	23	0.09	33	30	28	0.11	21	77	0.0020	0.0342
273	Third Party	2005/03728	2005	21	0.1	23	28	27	0.13	19	70	0.0020	0.0312
274	Third Party	2005/03729	2005	22	0.11	24	30	27	0.14	20	73	0.0020	0.0300
89	ABP	2006/04322	2006	19	0.14	34	63	49	0.49	19	145	0.0030	0.0030
90	Third Party	2006/04323	2006	14	0.05	30	48	38	0.29	16	111	0.0030	0.0030
91	Third Party	2006/04324	2006	16	0.04	30	45	41	0.27	17	115	0.0030	0.0030
260	ABP	2006/01264	2006	16	0.12	31	51	25	0.16	17	75	0.0168	0.0416
261	ABP	2006/01265	2006	15	0.08	18	32	19	0.09	11	59	0.0030	0.0263
262	Third Party	2006/01266	2006	16	0.12	26	45	24	0.12	17	88	0.0030	0.0431
263	Third Party	2006/01267	2006	16	0.1	27	37	25	0.1	16	74	0.0030	0.0397
264	ABP	2006/01268	2006	10	0.08	23	76	30	0.06	22	188	0.0030	0.0842
265	Third Party	2006/01269	2006	15	0.11	23	35	23	0.22	17	81	0.0030	0.0546
266	ABP	2006/01270	2006	18	0.07	30	25	23	0.04	17	73	0.0030	0.0208
267	ABP	2006/01271	2006	15	0.11	30	41	26	0.13	20	82	0.0303	0.1995
61	ABP	2008/01547	2008	17	0.08	21	23	24	0.12	14	70	0.0100	0.0943
69	ABP	2008/01555	2008	15	0.12	16	25	23	0.34	13	67	0.0113	0.0207
9	Third Party	2009/00467	2009	21	0.17	22	42	25	0.13	18	83	0.0077	0.0121
10	Third Party	2009/00468	2009	24	0.13	26	46	29	0.11	21	102	0.0040	0.0070
11	Third Party	2009/00469	2009	25	0.13	32	41	32	0.14	22	99	0.0107	0.0262
12	Third Party	2009/00470	2009	0	0	0	0	0	0	0	0	0.0000	0.0000
29	ABP	2009/00803	2009	16	0.1	21	33	26	0.12	15	91	0.0116	0.0261
36	ABP	2009/00811	2009	52	0.14	13	8.9	51	0.26	9.3	171	0.0020	0.0289
56	ABP	2009/03859	2009	22	0.19	59	59	46	0.35	28	133	0.0186	0.0376
241	ABP	2009/00795	2009	44	0.12	17	15	19	0.05	16	91	0.0101	0.0551
243	ABP	2009/00805	2009	20	0.12	20	26	27	0.13	15	97	0.0229	0.0341
244	ABP	2009/00813	2009	15	0.11	17	28	21	0.1	13	70	0.0095	0.0313
247	Third Party	2009/01196	2009	18	0.16	25	35	22	0.13	14	69	0.0099	0.0209
248	ABP	2009/01197	2009	13	0.12	29	19	17	0.07	16	61	0.0020	0.0132
249	Third Party	2009/01198	2009	15	0.15	24	27	20	0.11	14	65	0.0020	0.0224
250	Third Party	2009/01199	2009	19	0.18	23	35	23	0.37	18	74	0.0132	0.0519
251	ABP	2009/01200	2009	11	0.11	31	19	16	0.05	16	74	0.0078	0.3226
252	ABP	2009/01201	2009	19	0.13	26	27	23	0.09	14	151	0.0319	0.9876
253	Third Party	2009/01202	2009	17	0.14	36	29	23	0.12	18	73	0.0080	0.0210
254	Third Party	2009/03991	2009	21	0.05	43	25	29	0.1	22	86	0.0040	0.0070
255	Third Party	2009/03992	2009	20	0.05	37	24	31	0.16	20	92	0.0050	0.0100
256	Third Party	2009/03993	2009	27	0.06	53	31	32	0.23	26	94	0.0050	0.0110
212	ABP	2011/01109	2011	19	0.14	35	33	31	0.12	21	96	0.0030	0.0521
218	ABP	2011/01115	2011	17	0.13	29	33	27	0.12	19	97	0.0030	0.1735
275	Third Party	2011/03277	2011	29	0.14	70	37	33	0.08	34	129	0.0020	0.0150
276	Third Party	2011/03278	2011	26	0.1	60	27	30	0.07	28	96	0.0020	0.0020

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	AS	CD	CR	CU	PB	HG	NI	ZN	DBT	TBT
277	Third Party	2011/03279	2011	15	0.047	33	14	19	0.04	15	53	0.0010	0.0020
284	Third Party	2012/03530	2012	18	0.23	45	56	39	0.29	23	121	0.0180	0.0320
285	Third Party	2012/03531	2012	20	0.23	50	56	42	0.27	25	123	0.0000	0.0230
286	Third Party	2012/03532	2012	21	0.22	49	53	40	0.23	25	127	0.0000	0.0290
287	ABP	2012/03463	2012	18	0.15	24	39	32	0.13	16	108	0.0170	0.1300
288	ABP	2012/03464	2012	16	0.15	24	44	31	0.12	16	112	0.0200	0.1560
289	ABP	2012/03465	2012	17	0.12	21	35	29	0.11	15	95	0.0130	0.0920
290	ABP	2012/03466	2012	11	0.16	19	37	30	0.11	15	104	0.0210	0.0740
291	ABP	2012/03467	2012	17	0.1	20	33	29	0.1	15	91	0.0000	0.0580
292	ABP	2012/03468	2012	15	0.13	22	32	28	0.1	18	93	0.0370	0.1110
293	Third Party	2012/04246	2012	20	0.11	34	37	33	0.12	24	131		
294	Third Party	2012/04247	2012	23	0.15	60	56	139	0.11	20	119		
295	Third Party	2012/04248	2012	18	0.16	36	109	65	0.1	27	208		
299	Third Party	2012/03399	2012	22	0.23	54	60	45	0.18	27	142	0.0690	0.1320
300	Third Party	2012/03400	2012	13	0.14	30	39	28	0.12	15	120	0.0270	0.0840
301	Third Party	2012/03401	2012	17	0.19	49	62	41	0.23	22	264	0.0500	0.1020
302	Third Party	2012/03402	2012	25	0.14	21	44	33	0.16	16	76	0.0140	0.0330
303	Third Party	2012/03403	2012	30	0.15	30	43	32	0.17	18	93	0.0110	0.0180
304	Third Party	2012/03404	2012	20	0.13	19	36	26	0.13	16	69	0.0770	0.4120
305	Third Party	2012/03405	2012	18	0.12	24	34	26	0.12	17	72	0.0080	0.0160
306	Third Party	2012/03406	2012	15	0.31	18	42	26	0.42	15	193	0.0250	0.7510
309	Third Party	2014/16296	2014	7.437	0.0817	17.96	19.27	12.14		11.48	57.84	0.0053	0.0699
322	Third Party	2015/00003	2015	20.9	0.07	43.62	32.45	26.26	0.14	21.84	84.02	0.0000	0.0101
323	Third Party	2015/00003	2015	75.66	0.32	159.16	96.41	88.47	0.3	74.34	269.28	0.0000	0.0286
324	Third Party	2015/00003	2015	26	0.11	52.71	31.32	32.18	0.26	24.8	95.3	0.0000	0.0105
325	Third Party	2015/00003	2015	26	0.11	52.71	31.32	32.18	0.26	24.8	95.3	0.0000	0.0105
326	Third Party	2015/00003	2015	55.44	0.25	149.39	74.67	81.05	0.3	68.62	249.68	0.0000	0.0272
327	Third Party	2015/00003	2015	33.69	0.08	75.58	54.75	51.08	0.16	43.83	323.17	0.0000	0.1928
328	Third Party	2015/00003	2015	20.57	0.09	38.81	24.82	26.23	0.12	22.35	82.99	0.0000	0.0000
329	Third Party	2015/00003	2015	20.57	0.09	38.81	24.82	26.23	0.12	22.35	82.99	0.0000	0.0000
330	Third Party	2015/00003	2015	17.59	0.04	34.05	16.91	19.78	0.05	17.12	63.19	0.0000	0.0000
331	Third Party	2015/00003	2015	17.59	0.04	34.05	16.91	19.78	0.05	17.12	63.19	0.0000	0.0000
334	ABP	2016/3728568	2016	17.4	0.114	46.9	18.5	22.1	0.0422	22.4	73.4	<LOD	<LOD
335	ABP	2016/3728569	2016	17.4	0.114	46.9	18.5	22.1	0.0422	22.4	73.4	<LOD	<LOD
336	ABP	2016/3728570	2016	17.4	0.114	46.9	18.5	22.1	0.0422	22.4	73.4	<LOD	<LOD
337	ABP	2016/442537-109236	2016	18.5	0.092	62.5	21.9	23.8	0.0569	25	84	<LOD	<LOD
2	ABP	4469715	2019	15	0.11	43	29	29	0.13	19	81	0.0210	0.0160
15	ABP	4469719	2019	15	0.075	41	21	22	0.08	17	70	<LOD	0.0047
16	ABP	4469720	2019	13	0.11	34	14	17	0.064	17	55	<LOD	0.0036
17	ABP	4469721	2019	3.9	<LOD	17	3.7	5.2	0.013	8.3	20	<LOD	<LOD
18	ABP	4469722	2019	15	0.079	39	19	23	0.089	17	64	<LOD	0.0046
11	ABP	MAR01485.011	2022	9.1	0.07	24.3	12.6	9.1	0.01	13	42.4		
15	ABP	MAR01485.015	2022	13.2	0.08	25.8	34.8	25.7	0.11	16.6	77		
16	ABP	MAR01485.016	2022	4.6	<LOD	8.3	9.3	5.7	<LOD	7.7	19.4		
17	ABP	MAR01485.017	2022	16.1	0.13	28.8	25.1	27.2	0.07	20.1	75.2		
18	ABP	MAR01485.018	2022	12.3	0.85	16	16	17.6	0.06	11.7	1353		

A.2.8 Southampton Water – Polycyclic aromatic hydrocarbon results

Table A15. Southampton Water – Polycyclic Aromatic Hydrocarbon Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	23BA	ACENAPH	ACENAPT	ANTHRAC	BAA	BAP	BBF	BENZGHI	BEP	BKF	C1N	C1PHEN
175	ABP	2001/01404	2001	0.0001	0.0001	0.0001	0.0460	0.3080	0.4860	0.4540	0.2080	0.3190	0.2360	0.0420	0.1990
207	ABP	2001/01405	2001	0.0001	0.0001	0.0001	0.0081	0.0570	0.1310	0.1510	0.0760	0.1080	0.0660	0.0190	0.0490
133	Third Party	2004/09756	2004	0	0.0037	0.0100	0.0280	0.6370	0.1740	0.2630	0.0940	0.1400	0.0820	0.0460	0.1140
143	ABP	2004/02527	2004	0	0.0025	0.0032	0.0170	0.0610	0.1370	0.2230	0.0690	0.1380	0.0730	0.0280	0.0950
144	ABP	2004/02528	2004	0	0.0038	0.0041	0.0130	0.0690	0.1260	0.2150	0.0700	0.1430	0.0780	0.0290	0.1010
145	ABP	2004/02529	2004	0	0.0036	0.0044	0.0160	0.0760	0.1450	0.2440	0.0760	0.1500	0.0900	0.0290	0.1040
146	ABP	2004/02530	2004	0	0.0066	0.0048	0.0170	0.0470	0.1080	0.1830	0.0560	0.1200	0.0670	0.0310	0.0740
110	ABP	2005/01411	2005	0	0.0041	0.0030	0.0220	0.0790	0.1180	0.2060	0.0700	0.0950	0.0670	0.0250	0.0960
269	Third Party	2005/03724	2005	0	0.0039	0.0030	0.0140	0.0780	0.0770	0.1540	0.0410	0.0550	0.0450	0.0400	0.0690
270	ABP	2005/03725	2005	0	0.0038	0.0030	0.0170	0.0670	0.0690	0.1490	0.0410	0.0530	0.0450	0.0470	0.0760
271	ABP	2005/03726	2005	0	0.0023	0.0040	0.0230	0.0720	0.0840	0.1750	0.0370	0.0600	0.0520	0.0310	0.0750
272	ABP	2005/03727	2005	0	0.0026	0.0020	0.0150	0.0620	0.0580	0.1290	0.0370	0.0470	0.0360	0.0290	0.0610
273	Third Party	2005/03728	2005	0	0.0055	0.0030	0.0130	0.0720	0.0740	0.1370	0.0370	0.0530	0.0480	0.0330	0.0520
274	Third Party	2005/03729	2005	0	0.0058	0.0035	0.0120	0.0580	0.0720	0.1360	0.0360	0.0500	0.0480	0.0300	0.0590
90	Third Party	2006/04323	2006	0	0.0130	0.0110	0.0440	0.1920	0.2860	0.4530	0.1730	0.2060	0.1510	0.0460	0.1870
260	ABP	2006/01264	2006	0	0.0046	0.0320	0.0700	0.1090	0.1070	0.1850	0.0740	0.0840	0.0720	0.0420	0.3940
261	ABP	2006/01265	2006	0	0.0130	0.0056	0.5730	0.7690	0.6470	1.0120	0.2160	0.3850	0.3250	0.0450	0.3620
262	Third Party	2006/01266	2006	0	0.0050	0.0073	0.0340	0.0510	0.0850	0.1660	0.0510	0.0800	0.0580	0.0280	0.1500
263	Third Party	2006/01267	2006	0	0.0043	0.0042	0.0350	0.0630	0.0770	0.1520	0.0450	0.0590	0.0550	0.0280	0.1700
264	ABP	2006/01268	2006	0	0.0014	0.0008	0.0130	0.0190	0.0310	0.0730	0.0210	0.0300	0.0260	0.0088	0.0610
265	Third Party	2006/01269	2006	0	0.0025	0.0027	0.0260	0.0440	0.0590	0.1360	0.0430	0.0550	0.0380	0.0300	0.1310
266	ABP	2006/01270	2006	0	0.0017	0.0031	0.0170	0.0480	0.0570	0.1290	0.0370	0.0490	0.0370	0.0220	0.1150
267	ABP	2006/01271	2006	0	0.0015	0.0043	0.0310	0.0480	0.0760	0.1960	0.0490	0.0720	0.0540	0.0200	0.1250
61	ABP	2008/01547	2008	0	0.0027	0.0047	0.0190	0.0500	0.0790	0.1140	0.0510	0.0590	0.0480	0.0200	0.0830
69	ABP	2008/01555	2008	0	0.0025	0.0044	0.0160	0.0450	0.0820	0.0710	0.0540	0.0450	0.0300	0.0058	0.0460
12	Third Party	2009/00470	2009	0	0.0196	0.0475	0.0809	0.1483	0.0983	0.1851	0.0912	0.0862	0.0633	0.0929	0.3817
29	ABP	2009/00803	2009	0	0.0088	0.0090	0.0353	0.0557	0.0867	0.1138	0.0998	0.0768	0.0654	0.0328	0.1515
36	ABP	2009/00811	2009	0	0.0028	0.0018	0.0092	0.0107	0.0290	0.0278	0.0236	0.0211	0.0220	0.0122	0.0239
244	ABP	2009/00813	2009	0	0.0103	0.0101	0.0412	0.0226	0.0592	0.0636	0.0575	0.0446	0.0419	0.0310	0.2072
247	Third Party	2009/01196	2009	0	0.0099	0.0127	0.0574	0.1301	0.1263	0.1773	0.0841	0.1005	0.0856	0.0543	0.3819
248	ABP	2009/01197	2009	0	0.0060	0.0189	0.0505	0.1810	0.1811	0.2151	0.0772	0.1198	0.1253	0.0438	0.1828
249	Third Party	2009/01198	2009	0	0.0100	0.0130	0.0244	0.0786	0.0914	0.0993	0.0603	0.0855	0.0626	0.0615	0.1736
250	Third Party	2009/01199	2009	0	0.0076	0.0048	0.0268	0.0591	0.0780	0.1143	0.0537	0.0611	0.0579	0.0355	0.1692
251	ABP	2009/01200	2009	0	0.0012	0.0017	0.0068	0.0177	0.0183	0.0288	0.0104	0.0144	0.0134	0.0116	0.0533
252	ABP	2009/01201	2009	0	0.0034	0.0021	0.0211	0.0384	0.0479	0.0734	0.0330	0.0397	0.0333	0.0209	0.0807
253	Third Party	2009/01202	2009	0	0.0050	0.0052	0.0310	0.0674	0.0706	0.1127	0.0538	0.0637	0.0376	0.0453	0.1911
254	Third Party	2009/03991	2009	0	0.0029	0.0078	0.0161	0.0436	0.0541	0.0981	0.0510	0.0465	0.0338	0.0274	0.0936
255	Third Party	2009/03992	2009	0	0.0035	0.0055	0.0170	0.0470	0.0651	0.1084	0.0561	0.0573	0.0405	0.0329	0.0988
256	Third Party	2009/03993	2009	0	0.0040	0.0053	0.0160	0.0506	0.0811	0.1259	0.0604	0.0605	0.0420	0.0308	0.1017
212	ABP	2011/01109	2011	0	0.0093	0.0114	0.0302	0.1629	0.2240	0.2892	0.1857	0.1646	0.1505	0.0273	0.1528
218	ABP	2011/01115	2011	0	0.0078	0.0148	0.0261	0.1025	0.1422	0.2021	0.1302	0.1225	0.1012	0.0307	0.1163
275	Third Party	2011/03277	2011	0	0.0028	0.0026	0.0093	0.0360	0.0406	0.0555	0.0415	0.0358	0.0273	0.0166	0.0659
276	Third Party	2011/03278	2011	0	0.0018	0.0014	0.0058	0.0238	0.0275	0.0393	0.0274	0.0244	0.0175	0.0122	0.0447
277	Third Party	2011/03279	2011	0	0.0042	0.0039	0.0142	0.0548	0.0614	0.0902	0.0556	0.0483	0.0373	0.0241	0.0873
287	ABP	2012/03463	2012	0	0.007	0.007	0.024	0.09	0.136	0.189	0.115	0.102	0.092	0.028	0.108
288	ABP	2012/03464	2012	0	0.006	0.007	0.025	0.082	0.133	0.188	0.105	0.094	0.087	0.028	0.096
289	ABP	2012/03465	2012	0	0.006	0.006	0.023	0.072	0.12	0.173	0.097	0.082	0.081	0.024	0.088
290	ABP	2012/03466	2012	0	0.008	0.005	0.024	0.083	0.164	0.247	0.128	0.116	0.107	0.023	0.084
291	ABP	2012/03467	2012	0	0.005	0.005	0.02	0.066	0.11	0.157	0.088	0.081	0.07	0.022	0.089

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	23BA	ACENAPH	ACENAPT	ANTHRAC	BAA	BAP	BBF	BENZGHI	BEP	BKF	C1N	C1PHEN
292	ABP	2012/03468	2012	0	0.009	0.008	0.026	0.068	0.168	0.213	0.121	0.114	0.108	0.02	0.085
293	Third Party	2012/04246	2012	0	0.003	0.006	0.013	0.048	0.065	0.092	0.052	0.049	0.048	0.021	0.094
294	Third Party	2012/04247	2012	0	0.003	0.006	0.011	0.039	0.059	0.09	0.052	0.044	0.044	0.018	0.082
295	Third Party	2012/04248	2012	0	0.002	0.016	0.012	0.034	0.05	0.084	0.042	0.038	0.04	0.027	0.064
302	Third Party	2012/03402	2012	0	0.005	0.007	0.037	0.067	0.099	0.143	0.081	0.084	0.052	0.057	0.385
303	Third Party	2012/03403	2012	0	0.005	0.007	0.025	0.048	0.077	0.114	0.064	0.067	0.044	0.059	0.25
304	Third Party	2012/03404	2012	0	0.004	0.005	0.034	0.072	0.104	0.153	0.063	0.077	0.056	0.036	0.258
305	Third Party	2012/03405	2012	0	0.004	0.004	0.031	0.077	0.094	0.127	0.095	0.078	0.061	0.023	0.169
306	Third Party	2012/03406	2012	0	0.003	0.003	0.016	0.026	0.063	0.087	0.051	0.051	0.033	0.017	0.093
2	ABP	4469715	2019		59	<LOD	54	180	190	190	120	140.0000	90.0000	71	160
15	ABP	4469719.00	2019		<LOD	<LOD	12	37	57	32	51	53	32	20	68
16	ABP	4469720.00	2019		<LOD	<LOD	<LOD	24	37	42	30	33	20	10	37
17	ABP	4469721.00	2019		<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
18	ABP	4469722.00	2019		<LOD	<LOD	12	54	71	85	63	66	38	25	96

Table A16. Southampton Water – Polycyclic Aromatic Hydrocarbon Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	C2N	C3N	CHRYSEN	DBENZAH	FLUORAN	FLUOREN	INDPYR	NAPTH	PERYLEN	PHENANT	PYRENE	THC
175	ABP	2001/01404	2001	0.0720	0.1500	0.2480	0.0600	0.5980	0.0001	0.2530	0.0420	0.1820	0.0970	0.8530	0
207	ABP	2001/01405	2001	0.0280	0.0620	0.0280	0.0190	0.1010	0.0001	0.0910	0.0100	0.1090	0.0210	0.2480	0
133	Third Party	2004/09756	2004	0.1390	0.1270	0.1060	0.0220	0.2770	0.0160	0.0900	0.0300	0.2140	0.0600	0.4570	745
143	ABP	2004/02527	2004	0.0440	0.0990	0.0810	0.0190	0.1270	0.0070	0.0880	0.0089	0.1380	0.0320	0.1750	344
144	ABP	2004/02528	2004	0.0530	0.1270	0.0870	0.0170	0.1270	0.0049	0.0780	0.0140	0.1440	0.0360	0.1680	279
145	ABP	2004/02529	2004	0.0510	0.1220	0.0930	0.0180	0.1470	0.0061	0.0920	0.0130	0.1580	0.0410	0.1920	352
146	ABP	2004/02530	2004	0.0440	0.1010	0.0540	0.0140	0.0850	0.0076	0.0700	0.0220	0.1280	0.0290	0.1870	282
110	ABP	2005/01411	2005	0.0440	0.1220	0.0920	0.0210	0.1360	0.0055	0.0790	0.0160	0.1410	0.0330	0.1830	245
269	Third Party	2005/03724	2005	0.0520	0.1020	0.0450	0.0086	0.1020	0.0052	0.0560	0.0140	0.1060	0.0330	0.1140	201
270	ABP	2005/03725	2005	0.0640	0.1170	0.0360	0.0067	0.1100	0.0045	0.0570	0.0170	0.0960	0.0400	0.1160	198
271	ABP	2005/03726	2005	0.0620	0.1120	0.0430	0.0080	0.1600	0.0069	0.0580	0.0110	0.0920	0.0390	0.1510	191
272	ABP	2005/03727	2005	0.0500	0.1280	0.0220	0.0077	0.0830	0.0039	0.0510	0.0087	0.0910	0.0300	0.1000	175
273	Third Party	2005/03728	2005	0.0530	0.0830	0.0520	0.0110	0.0800	0.0046	0.0560	0.0150	0.0940	0.0270	0.0890	158
274	Third Party	2005/03729	2005	0.0420	0.1000	0.0430	0.0120	0.0850	0.0063	0.0520	0.0150	0.0910	0.0340	0.1000	171
90	Third Party	2006/04323	2006	0.1000	0.1720	0.1470	0.0460	0.3380	0.0160	0.2290	0.0310	0.1910	0.0820	0.4870	562
260	ABP	2006/01264	2006	0.1660	0.4710	0.1050	0.0290	0.3720	0.0410	0.0710	0.0200	0.1210	0.2700	0.3370	604
261	ABP	2006/01265	2006	0.0800	0.2830	0.8220	0.0970	1.5560	0.0190	0.2780	0.0510	0.2350	0.2050	1.5650	458
262	Third Party	2006/01266	2006	0.0650	0.1670	0.0470	0.0190	0.1130	0.0110	0.0740	0.0130	0.1280	0.0490	0.1700	445
263	Third Party	2006/01267	2006	0.0760	0.2040	0.0780	0.0220	0.1320	0.0071	0.0560	0.0110	0.1110	0.0480	0.1580	374
264	ABP	2006/01268	2006	0.0270	0.0530	0.0150	0.0071	0.0370	0.0024	0.0280	0.0038	0.0890	0.0150	0.0770	215
265	Third Party	2006/01269	2006	0.0750	0.1640	0.0630	0.0140	0.0900	0.0062	0.0500	0.0096	0.0980	0.0340	0.1280	336
266	ABP	2006/01270	2006	0.0550	0.1460	0.0680	0.0120	0.1140	0.0047	0.0470	0.0100	0.0900	0.0470	0.1200	172
267	ABP	2006/01271	2006	0.0500	0.1090	0.0650	0.0200	0.1100	0.0067	0.0710	0.0074	0.0980	0.0430	0.1660	422
61	ABP	2008/01547	2008	0.0430	0.1240	0.0500	0.0190	0.1030	0.0066	0.0510	0.0140	0.0810	0.0340	0.1430	178
69	ABP	2008/01555	2008	0.0320	0.1600	0.0390	0.0110	0.0880	0.0078	0.0530	0.0076	0.1380	0.0190	0.1420	291
12	Third Party	2009/00470	2009	0.2572	0.8190	0.1731	0.0454	0.3044	0.0516	0.0925	0.0360	0.1400	0.1392	0.3801	504
29	ABP	2009/00803	2009	0.0881	0.1620	0.0731	0.0217	0.1017	0.0107	0.1073	0.0174	0.1410	0.0278	0.1367	320
36	ABP	2009/00811	2009	0.0147	0.0268	0.0137	0.0057	0.0189	0.0019	0.0291	0.0081	0.0147	0.0099	0.0326	54
244	ABP	2009/00813	2009	0.0820	0.2159	0.0337	0.0133	0.0604	0.0094	0.0620	0.0141	0.0947	0.0308	0.1116	278
247	Third Party	2009/01196	2009	0.1786	0.8220	0.1230	0.0475	0.1883	0.0168	0.1197	0.0281	0.1164	0.0485	0.2795	803
248	ABP	2009/01197	2009	0.1073	0.4070	0.1872	0.0318	0.2329	0.0142	0.1068	0.0336	0.4156	0.1248	0.2631	310
249	Third Party	2009/01198	2009	0.1585	0.5370	0.0803	0.0202	0.1110	0.0224	0.0745	0.0376	0.1167	0.0609	0.1913	494
250	Third Party	2009/01199	2009	0.0933	0.2863	0.0649	0.0210	0.1016	0.0125	0.0613	0.0172	0.2538	0.0381	0.1705	472
251	ABP	2009/01200	2009	0.0258	0.0894	0.0132	0.0057	0.0269	0.0033	0.0153	0.0044	0.1016	0.0099	0.0371	90

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	C2N	C3N	CHRYSEN	DBENZAH	FLUORAN	FLUOREN	INDPYR	NAPTH	PERYLEN	PHENANT	PYRENE	THC
252	ABP	2009/01201	2009	0.0417	0.0959	0.0389	0.0151	0.0492	0.0081	0.0484	0.0107	0.0664	0.0220	0.0964	271
253	Third Party	2009/01202	2009	0.1026	0.4616	0.0611	0.0171	0.0976	0.0129	0.0619	0.0173	0.0970	0.0397	0.1560	443
254	Third Party	2009/03991	2009	0.0552	0.1317	0.0403	0.0130	0.1208	0.0068	0.0592	0.0153	0.0800	0.0372	0.1291	184
255	Third Party	2009/03992	2009	0.0703	0.1517	0.0444	0.0157	0.1394	0.0060	0.0728	0.0184	0.0885	0.0463	0.1375	205
256	Third Party	2009/03993	2009	0.0665	0.1637	0.0493	0.0148	0.1382	0.0062	0.0778	0.0156	0.1028	0.0429	0.1503	206
212	ABP	2011/01109	2011	0.0592	0.1237	0.1284	0.0315	0.3408	0.0132	0.2148	0.0191	0.1739	0.0616	0.3024	419
218	ABP	2011/01115	2011	0.0682	0.1275	0.0705	0.0230	0.2408	0.0149	0.1469	0.0175	0.1371	0.0586	0.2232	363
275	Third Party	2011/03277	2011	0.0381	0.0830	0.0202	0.0083	0.0577	0.0040	0.0512	0.0079	0.1018	0.0181	0.0671	176
276	Third Party	2011/03278	2011	0.0243	0.0552	0.0134	0.0053	0.0396	0.0027	0.0347	0.0056	0.0833	0.0121	0.0455	119
277	Third Party	2011/03279	2011	0.0482	0.1090	0.0322	0.0107	0.0993	0.0056	0.0676	0.0096	0.1122	0.0294	0.1077	203
287	ABP	2012/03463	2012	0.047	0.117	0.057	0.025	0.219	0.009	0.142	0.015	0.117	0.048	0.256	199
288	ABP	2012/03464	2012	0.047	0.09	0.047	0.022	0.191	0.01	0.125	0.016	0.172	0.057	0.223	268
289	ABP	2012/03465	2012	0.045	0.094	0.04	0.02	0.16	0.008	0.119	0.012	0.193	0.048	0.201	317
290	ABP	2012/03466	2012	0.04	0.072	0.043	0.028	0.188	0.008	0.159	0.013	0.186	0.048	0.263	359
291	ABP	2012/03467	2012	0.043	0.086	0.039	0.019	0.143	0.007	0.11	0.012	0.163	0.043	0.183	294
292	ABP	2012/03468	2012	0.034	0.063	0.044	0.026	0.13	0.008	0.145	0.013	0.191	0.057	0.324	283
293	Third Party	2012/04246	2012	0.046	0.186	0.041	0.011	0.11	0.006	0.072	0.018	0.08	0.034	0.103	178
294	Third Party	2012/04247	2012	0.044	0.088	0.033	0.011	0.083	0.005	0.071	0.009	0.085	0.033	0.087	196
295	Third Party	2012/04248	2012	0.039	0.062	0.03	0.009	0.11	0.008	0.06	0.013	0.069	0.051	0.102	185
302	Third Party	2012/03402	2012	0.147	0.785	0.05	0.02	0.126	0.011	0.085	0.02	0.198	0.047	0.191	687
303	Third Party	2012/03403	2012	0.119	0.483	0.038	0.015	0.101	0.009	0.07	0.023	0.159	0.047	0.142	471
304	Third Party	2012/03404	2012	0.085	0.533	0.056	0.024	0.135	0.01	0.082	0.026	0.205	0.044	0.179	613
305	Third Party	2012/03405	2012	0.068	0.209	0.049	0.02	0.114	0.006	0.086	0.01	0.163	0.03	0.149	437
306	Third Party	2012/03406	2012	0.041	0.137	0.018	0.012	0.078	0.005	0.06	0.008	0.124	0.02	0.136	339
334	ABP	2016/3728568	2016												180
335	ABP	2016/3728569	2016												180
336	ABP	2016/3728570	2016												180
337	ABP	2016/442537-109236	2016												196
2	ABP	4469715	2019	120.0000	62.0000	130.0000	26.0000	380.0000	47.0000	110.0000	44.0000	140.0000	290.0000	410	520
15	ABP	4469719.00	2019	24.0000	33.0000	34.0000	<LOD	65.0000	<LOD	43.0000	<LOD	85.0000	19.0000	100	300
16	ABP	4469720.00	2019	12.0000	19.0000	19.0000	<LOD	37.0000	<LOD	25.0000	18.0000	85.0000	16.0000	64	120
17	ABP	4469721.00	2019	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	4
18	ABP	4469722.00	2019	33.0000	64.0000	40.0000	11.0000	96.0000	<LOD	53.0000	<LOD	110.0000	25.0000	150	330
11		MAR01485.011	2022												34
15		MAR01485.015	2022												18
16		MAR01485.016	2022												12
17		MAR01485.017	2022												10
18		MAR01485.018	2022												21

A.2.9 Southampton Water – Polychlorinated biphenyl results

Table A17. Southampton Water – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#101	CB#105	CB#110	CB#118	CB#128	CB#138	CB#141	CB#149	CB#151	CB#153	CB#156	CB#158
175	ABP	2001/01404	2001	0.0021	0.0008	0.0050	0.0026	0.0005	0.0029	0.0004	0.0020	0.0005	0.0022	0.0004	0.0003
207	ABP	2001/01405	2001	0.0003	0.0000	0.0012	0.0006	0.0000	0.0005	0.0000	0.0004	0.0000	0.0005	0.0000	0.0000
133	Third Party	2004/09756	2004	0.0011	0.0004	0.0013	0.0011	0.0002	0.0014	0.0003	0.0008	0.0002	0.0012	0.0002	0.0002
143	ABP	2004/02527	2004	0.0003	0.0002	0.0004	0.0003	0.0002	0.0004	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
144	ABP	2004/02528	2004	0.0003	0.0002	0.0004	0.0004	0.0002	0.0005	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
145	ABP	2004/02529	2004	0.0003	0.0002	0.0004	0.0004	0.0002	0.0005	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
146	ABP	2004/02530	2004	0.0003	0.0002	0.0004	0.0003	0.0002	0.0004	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
90	Third Party	2006/04323	2006	0.0010	0.0004	0.0012	0.0009	0.0003	0.0014	0.0002	0.0010	0.0002	0.0012	0.0002	0.0002
260	ABP	2006/01264	2006	0.0005	0.0003	0.0006	0.0006	0.0002	0.0008	0.0002	0.0005	0.0002	0.0006	0.0002	0.0002
261	ABP	2006/01265	2006	0.0002	0.0002	0.0003	0.0003	0.0002	0.0005	0.0002	0.0002	0.0002	0.0004	0.0002	0.0002
262	Third Party	2006/01266	2006	0.0004	0.0003	0.0005	0.0004	0.0002	0.0005	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
263	Third Party	2006/01267	2006	0.0003	0.0003	0.0005	0.0004	0.0002	0.0006	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
264	ABP	2006/01268	2006	0.0002	0.0002	0.0003	0.0003	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
265	Third Party	2006/01269	2006	0.0004	0.0003	0.0005	0.0005	0.0002	0.0006	0.0002	0.0003	0.0002	0.0005	0.0002	0.0002
266	ABP	2006/01270	2006	0.0002	0.0002	0.0003	0.0004	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
267	ABP	2006/01271	2006	0.0007	0.0003	0.0009	0.0008	0.0002	0.0008	0.0002	0.0006	0.0002	0.0008	0.0003	0.0002
69	ABP	2008/01555	2008	0.0003	0.0002	0.0004	0.0004	0.0002	0.0005	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
12	Third Party	2009/00470	2009	0.0005	0.0002	0.0005	0.0005	0.0002	0.0006	0.0002	0.0005	0.0002	0.0006	0.0002	0.0002
29	ABP	2009/00803	2009	0.0004	0.0002	0.0004	0.0004	0.0002	0.0004	0.0002	0.0003	0.0002	0.0005	0.0002	0.0002
247	Third Party	2009/01196	2009	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0002	0.0006	0.0002	0.0002
248	ABP	2009/01197	2009	0.0010	0.0003	0.0009	0.0010	0.0003	0.0014	0.0002	0.0009	0.0002	0.0012	0.0002	0.0002
249	Third Party	2009/01198	2009	0.0005	0.0002	0.0004	0.0004	0.0002	0.0005	0.0002	0.0004	0.0002	0.0005	0.0002	0.0002
250	Third Party	2009/01199	2009	0.0006	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0004	0.0002	0.0006	0.0002	0.0002
251	ABP	2009/01200	2009	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
252	ABP	2009/01201	2009	0.0003	0.0002	0.0003	0.0003	0.0002	0.0004	0.0002	0.0003	0.0002	0.0004	0.0002	0.0002
253	Third Party	2009/01202	2009	0.0004	0.0002	0.0004	0.0004	0.0002	0.0006	0.0002	0.0005	0.0002	0.0007	0.0002	0.0002
287	ABP	2012/03463	2012	0.0016	0.0004	0.0020	0.0015	0.0002	0.0009	0.0002	0.0008	0.0002	0.0010	0.0002	0.0002
288	ABP	2012/03464	2012	0.0016	0.0003	0.0019	0.0014	0.0002	0.0009	0.0002	0.0008	0.0002	0.0009	0.0002	0.0002
289	ABP	2012/03465	2012	0.0008	0.0002	0.0008	0.0008	0.0002	0.0008	0.0002	0.0008	0.0002	0.0009	0.0002	0.0002
290	ABP	2012/03466	2012	0.0008	0.0002	0.0008	0.0007	0.0002	0.0008	0.0002	0.0007	0.0002	0.0009	0.0002	0.0002
291	ABP	2012/03467	2012	0.0008	0.0002	0.0008	0.0007	0.0002	0.0007	0.0002	0.0007	0.0002	0.0008	0.0002	0.0002
292	ABP	2012/03468	2012	0.0010	0.0002	0.0010	0.0009	0.0002	0.0009	0.0002	0.0009	0.0002	0.0011	0.0002	0.0002
299	Third Party	2012/03399	2012	0.0017	0.0004	0.0019	0.0015	0.0004	0.0021	0.0003	0.0020	0.0005	0.0024	0.0002	0.0002
300	Third Party	2012/03400	2012	0.0027	0.0007	0.0026	0.0022	0.0005	0.0028	0.0004	0.0025	0.0006	0.0030	0.0003	0.0003
301	Third Party	2012/03401	2012	0.0031	0.0008	0.0031	0.0026	0.0007	0.0036	0.0005	0.0031	0.0007	0.0038	0.0004	0.0004
309	Third Party	2014/16296	2014	0.0001	0.0000	0.0002	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000
2	ABP	4469715	2019	0.00035	0.000088	0.00042	0.00034	0.000081	0.00037	<LOD	0.00036	0.000082	0.00052	<LOD	<LOD
15	ABP	4469719	2019	<LOD	<LOD	0.00016	0.00015	<LOD	0.0003	<LOD	0.00013	<LOD	0.00024	<LOD	<LOD
16	ABP	4469720	2019	0.0002	<LOD	0.00015	0.00017	<LOD	0.00021	<LOD	0.00014	<LOD	0.00026	<LOD	<LOD
17	ABP	4469721	2019	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
18	ABP	4469722	2019	0.00022	<LOD	0.00019	0.0002	0.000084	0.0003	<LOD	0.00016	<LOD	0.0003	<LOD	<LOD

Table A18. Southampton Water – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	CB#170	CB#18	CB#180	CB#183	CB#187	CB#194	CB#28	CB#31	CB#44	CB#47	CB#49	CB#52	CB#66
175	ABP	2001/01404	2001	0.0007	0.0004	0.0015	0.0002	0.0006	0.0003	0.0012	0.0007	0.0009	0.0003	0.0010	0.0014	0.0022
207	ABP	2001/01405	2001	0.0000	0.0004	0.0003	0.0000	0.0000	0.0000	0.0009	0.0005	0.0004	0.0000	0.0005	0.0006	0.0006
133	Third Party	2004/09756	2004	0.0003	0.0003	0.0007	0.0002	0.0003	0.0002	0.0006	0.0004	0.0004	0.0002	0.0006	0.0006	0.0002
143	ABP	2004/02527	2004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0013	0.0002	0.0002
144	ABP	2004/02528	2004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0002
145	ABP	2004/02529	2004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0007	0.0002	0.0002
146	ABP	2004/02530	2004	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0009	0.0002	0.0002
90	Third Party	2006/04323	2006	0.0003	0.0003	0.0009	0.0002	0.0005	0.0002	0.0006	0.0004	0.0003	0.0002	0.0005	0.0005	0.0006
260	ABP	2006/01264	2006	0.0003	0.0002	0.0006	0.0002	0.0002	0.0002	0.0004	0.0003	0.0002	0.0002	0.0003	0.0002	0.0006
261	ABP	2006/01265	2006	0.0002	0.0002	0.0004	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004
262	Third Party	2006/01266	2006	0.0002	0.0002	0.0004	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
263	Third Party	2006/01267	2006	0.0002	0.0002	0.0004	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
264	ABP	2006/01268	2006	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
265	Third Party	2006/01269	2006	0.0002	0.0002	0.0004	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004
266	ABP	2006/01270	2006	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004
267	ABP	2006/01271	2006	0.0003	0.0002	0.0005	0.0002	0.0002	0.0002	0.0005	0.0004	0.0003	0.0002	0.0005	0.0004	0.0008
69	ABP	2008/01555	2008	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003
12	Third Party	2009/00470	2009	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003
29	ABP	2009/00803	2009	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
247	Third Party	2009/01196	2009	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0002
248	ABP	2009/01197	2009	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003
249	Third Party	2009/01198	2009	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002
250	Third Party	2009/01199	2009	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0002	0.0003	0.0004	0.0003
251	ABP	2009/01200	2009	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
252	ABP	2009/01201	2009	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
253	Third Party	2009/01202	2009	0.0002	0.0002	0.0005	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002
287	ABP	2012/03463	2012	0.00021	0.0117	0.00045	0.0002	0.00031	0.0002	0.0189	0.0153	0.0062	0.0027	0.0064	0.0072	0.0054
288	ABP	2012/03464	2012	0.0002	0.0154	0.00042	0.0002	0.0003	0.0002	0.0233	0.0196	0.0067	0.0028	0.0071	0.0082	0.0052
289	ABP	2012/03465	2012	0.0002	0.001	0.00041	0.0002	0.00029	0.0002	0.0014	0.0011	0.00063	0.00033	0.00077	0.00097	0.0006
290	ABP	2012/03466	2012	0.0002	0.001	0.00043	0.0002	0.00031	0.0002	0.0014	0.0011	0.00064	0.00035	0.0008	0.00097	0.00065
291	ABP	2012/03467	2012	0.0002	0.0023	0.00036	0.0002	0.00026	0.0002	0.0028	0.0024	0.0011	0.00052	0.0012	0.0014	0.0009
292	ABP	2012/03468	2012	0.00021	0.0011	0.00046	0.0002	0.00035	0.0002	0.0015	0.0011	0.00076	0.00041	0.001	0.0012	0.00072
299	Third Party	2012/03399	2012	0.00072	0.0026	0.0015	0.00025	0.0009	0.00043	0.004	0.0031	0.0017	0.0008	0.002	0.0022	0.0014
300	Third Party	2012/03400	2012	0.00081	0.0019	0.0017	0.00031	0.00095	0.00044	0.003	0.0025	0.0014	0.00055	0.0015	0.0024	0.0015
301	Third Party	2012/03401	2012	0.001	0.0013	0.0021	0.00039	0.0012	0.00052	0.0023	0.0017	0.0012	0.00056	0.0014	0.0021	0.0017
309	Third Party	2014/16296	2014	0.000725	0.000725	0.0724	0.000725	0.000725	0.000725							
2	ABP	4469715	2019	0.000092	0.00014	0.0002	<LOD	0.00012	<LOD	0.00033	0.0002	0.00021	0.00016	0.0003	0.00033	0.00026
15	ABP	4469719	2019	<LOD	<LOD	0.00013	<LOD	<LOD	<LOD	0.00014	<LOD	<LOD	<LOD	<LOD	0.00012	<LOD
16	ABP	4469720	2019	0.00008	<LOD	0.00017	<LOD	0.000091	<LOD	0.00017	0.0001	0.0001	<LOD	0.000098	0.00015	0.00017
17	ABP	4469721	2019	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD
18	ABP	4469722	2019	<LOD	<LOD	<LOD	<LOD	<LOD	<LOD	0.00016	0.0001	0.000084	<LOD	0.000092	0.00014	0.00016

Table A19. Southampton Water – Polychlorinated Biphenyl Results

Report Sample No.	Operator	Sample ID (LSN)	Year Sampled	TOT25CBS	TOTICES7	AHCH	GHCH	HCB	DIELDRIN	PPDDE	PPDDT	PPTDE
175	ABP	2001/01404	2001	0.0310	0.0139	0.0000	0.0002	0.0000	0.0012	0.0003	0.0051	0.0012
207	ABP	2001/01405	2001	0.0076	0.0036	0.0000	0.0004	0.0000	0.0011	0.0003	0.0049	0.0011
133	Third Party	2004/09756	2004	0.0135	0.0068	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
143	ABP	2004/02527	2004	0.0070	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
144	ABP	2004/02528	2004	0.0065	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
145	ABP	2004/02529	2004	0.0066	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
146	ABP	2004/02530	2004	0.0065	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
90	Third Party	2006/04323	2006	0.0136	0.0064	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
260	ABP	2006/01264	2006	0.0087	0.0036	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
261	ABP	2006/01265	2006	0.0061	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
262	Third Party	2006/01266	2006	0.0067	0.0026	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
263	Third Party	2006/01267	2006	0.0069	0.0026	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
264	ABP	2006/01268	2006	0.0055	0.0017	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
265	Third Party	2006/01269	2006	0.0073	0.0028	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
266	ABP	2006/01270	2006	0.0058	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
267	ABP	2006/01271	2006	0.0104	0.0045	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
69	ABP	2008/01555	2008	0.0064	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
12	Third Party	2009/00470	2009	0.0072	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
29	ABP	2009/00803	2009	0.0062	0.0022	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
247	Third Party	2009/01196	2009	0.0072	0.0029	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
248	ABP	2009/01197	2009	0.0108	0.0054	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
249	Third Party	2009/01198	2009	0.0067	0.0026	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
250	Third Party	2009/01199	2009	0.0074	0.0031	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
251	ABP	2009/01200	2009	0.0050	0.0014	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
252	ABP	2009/01201	2009	0.0057	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
253	Third Party	2009/01202	2009	0.0072	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
287	ABP	2012/03463	2012	0.0843	0.0315	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
288	ABP	2012/03464	2012	0.0985	0.0367	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
289	ABP	2012/03465	2012	0.0141	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
290	ABP	2012/03466	2012	0.0142	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
291	ABP	2012/03467	2012	0.0195	0.0076	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
292	ABP	2012/03468	2012	0.0161	0.0070	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
299	Third Party	2012/03399	2012	0.0352	0.0154	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
300	Third Party	2012/03400	2012	0.0375	0.0178	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
301	Third Party	2012/03401	2012	0.0404	0.0196	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
309	Third Party	2014/16296	2014	0.0768	0.0729							
2	ABP	4469715	2019	0.0050	0.0024							
15	ABP	4469719	2019	0.0014	0.0011							
16	ABP	4469720	2019	0.0023	0.0013							
17	ABP	4469721	2019	0.0000	0.0000							
18	ABP	4469722	2019	0.0022	0.0013							

B SPA Site Bird Species

Table B1. Bird species qualifying under the Birds Directive using the marine component of the Solent and Southampton Water SPA at the time of classification

Solent and Southampton Water SPA			
Article 4.1			
Mediterranean Gull	<i>Larus melanocephalus</i>	Breeding	
Little Tern	<i>Sterna albifrons</i>	Breeding	
Roseate Tern	<i>Sterna dougallii</i>	Breeding	
Common Tern	<i>Sterna hirundo</i>	Breeding	
Sandwich Tern	<i>Sterna sandvicensis</i>	Breeding	
Article 4.2			
Black-tailed Godwit	<i>Limosa limosa islandica</i>		Overwintering
Dark-bellied Brent Goose	<i>Branta bernicla bernicla</i>		Overwintering
Ringed Plover	<i>Charadrius hiaticula</i>		Overwintering
Teal	<i>Anas crecca</i>		Overwintering
Internationally important assemblages: 51, 361 water birds			

Source: JNCC, 2006a

Table B2. Bird species qualifying under the Birds Directive using the marine component of the Portsmouth Harbour SPA at the time of classification

Portsmouth Harbour SPA			
Article 4.2			
Black-tailed Godwit	<i>Limosa limosa islandica</i>		Overwintering
Dark-bellied Brent Goose	<i>Branta bernicla bernicla</i>		Overwintering
Dunlin	<i>Calidris alpina alpina</i>		Overwintering
Red-breasted Merganser	<i>Mergus serrator</i>		Overwintering

Source: JNCC, 2006b

Table B3. Bird species qualifying under the Birds Directive using the marine component of the Chichester and Langstone Harbours SPA at the time of classification

Chichester and Langstone Harbours SPA			
Article 4.1			
Little Tern	<i>Sterna albifrons</i>	Breeding	
Common Tern	<i>Sterna hirundo</i>	Breeding	
Sandwich Tern	<i>Sterna sandvicensis</i>	Breeding	
Bar-tailed Godwit	<i>Limosa lapponica</i>		Overwintering
Article 4.2			
Black-tailed Godwit	<i>Limosa limosa islandica</i>		Overwintering
Dark-bellied Brent Goose	<i>Branta bernicla bernicla</i>		Overwintering
Dunlin	<i>Calidris alpina alpina</i>		Overwintering
Eurasian Curlew	<i>Numenius arquata</i>		Overwintering
Eurasian Wigeon	<i>Anas penelope</i>		Overwintering
Grey Plover	<i>Pluvialis squatarola</i>		Overwintering
Northern Pintail	<i>Anas acuta</i>		Overwintering
Northern Shoveler	<i>Anas clypeata</i>		Overwintering
Red-breasted Merganser	<i>Mergus serrator</i>		Overwintering
Redshank	<i>Tringa totanus</i>		Overwintering
Ringed Plover	<i>Charadrius hiaticula</i>		Overwintering
Ruddy Turnstone	<i>Arenaria interpres</i>		Overwintering
Sanderling	<i>Calidris alba</i>		Overwintering
Shelduck	<i>Tadorna tadorna</i>		Overwintering
Teal	<i>Anas crecca</i>		Overwintering
Internationally important assemblages: 93,230 waterfowl			

Source: JNCC, 2006c

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