



PORT OF LONDON  
AUTHORITY

**PRINCES CHANNEL DEVELOPMENT**  
**Recycling of Dredged Material in the**  
**Outer Thames Estuary**

Environmental Scoping Report  
August 2003



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# **1 INTRODUCTION**

## **1.1 Scoping Study**

The Port of London Authority (PLA) is undertaking the deepening of Princes Channel, which forms part of the southern approaches to the Port of London, and since opportunities for beneficial use may not be sufficient to accommodate all the material to be dredged, the PLA proposes to relocate the material dredged from the channel to a site within the outer Thames Estuary. A number of potential relocation areas have been identified and a selection process used to refine the choice to a preferred option of the North Edinburgh Channel plus Princes Channel East as a viable alternative.

This Scoping Report outlines the alternative options and the selection criteria employed to identify the preferred option. The report uses existing data to describe the baseline environment for the selected locations and makes recommendations for additional data requirements needed to inform an environmental assessment. In making these recommendations the Scoping Report draws on the consultation, survey work and assessment already carried out by the PLA for the Princes Channel Development.

This Scoping Report is divided into five Sections. This Section introduces the project and outlines the study area. Section 2 describes the proposals in detail while Section 3 outlines the legislative context in which they are set. Section 4 provides an overview of the potential impacts of the proposals, identifies the existing data relevant to the relocation areas and defines the work required to fully characterize the sites and inform an environmental assessment. Finally, Section 5 summarises the scoping requirements and assessment process.

## **1.2 Project Description**

### **1.2.1 Background**

The PLA has a statutory responsibility for maintaining safe navigation within its port limits, as shown in Figure 1. In practice this responsibility is met by a navigational Safety Management System, which includes state of the art Vessel Traffic Services (VTS), Port Control Centres, hydrographic surveys, chart production, the provision of pilotage, and where necessary, the maintenance of sufficient channel depth to permit safe access.

### **1.2.2 Princes Channel Development**

Princes Channel forms part of the southern approaches to the Port of London. Figure 1 shows the main approaches to the Port. Following recommendations from a navigational risk assessment that studied these approaches, the PLA is proposing to deepen Princes Channel to a depth of -8.0m CD. The deepening is

proceeding in two phases with Phase I undertaken as a trial. The objective of the trial is to deepen the western section of the Channel to approximately  $-7.0\text{m CD}$ , which is marginally below the regime depth at this location, and then to study the channel stability and rate of infill. If the trial in the channel shows the dredged profiles to be sustainable, it is the PLA's intention to deepen the channel to a target depth of  $-8.0\text{m below CD}$ , thus providing an alternative but safer access from the south than is presently available.

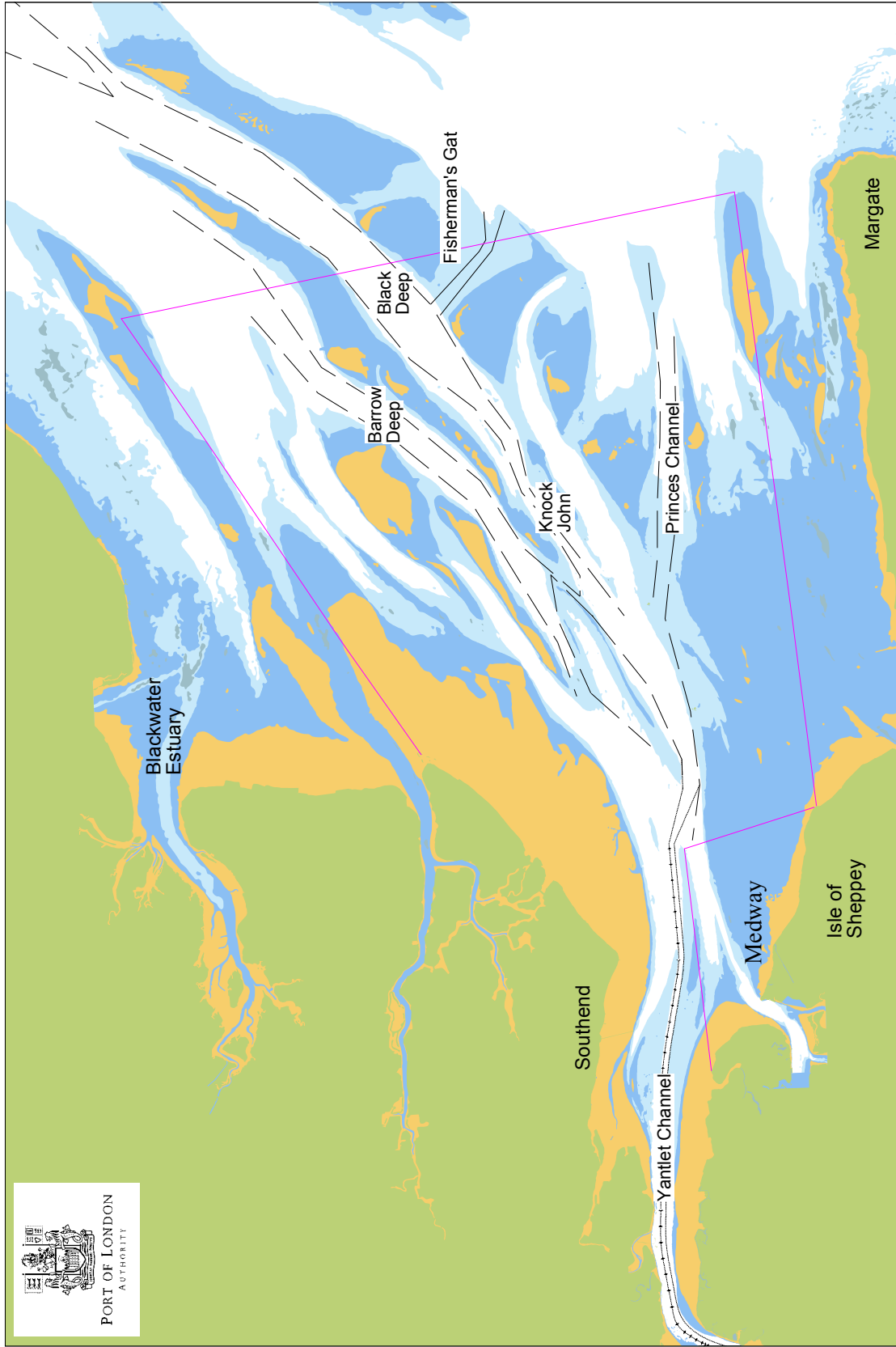
Further information on the Princes Channel deepening is available in the Princes Channel Development Environmental Review prepared by the PLA (2003).

### 1.2.3 Beneficial Use of Dredged Material

The PLA is committed to using dredged material beneficially where possible, in accordance with Government guidance and International requirements, including the London Convention and OSPAR. Investigations are ongoing to identify uses for dredged material from Phase II and all potential uses will be considered, including construction projects, habitat creation, coastal defences and recycling within the estuary system. Offshore disposal at a licensed marine disposal site will be considered a last resort and only when beneficial use is not available, or for material that is physically unsuitable for beneficial use.

### 1.2.4 Recycling with the estuary

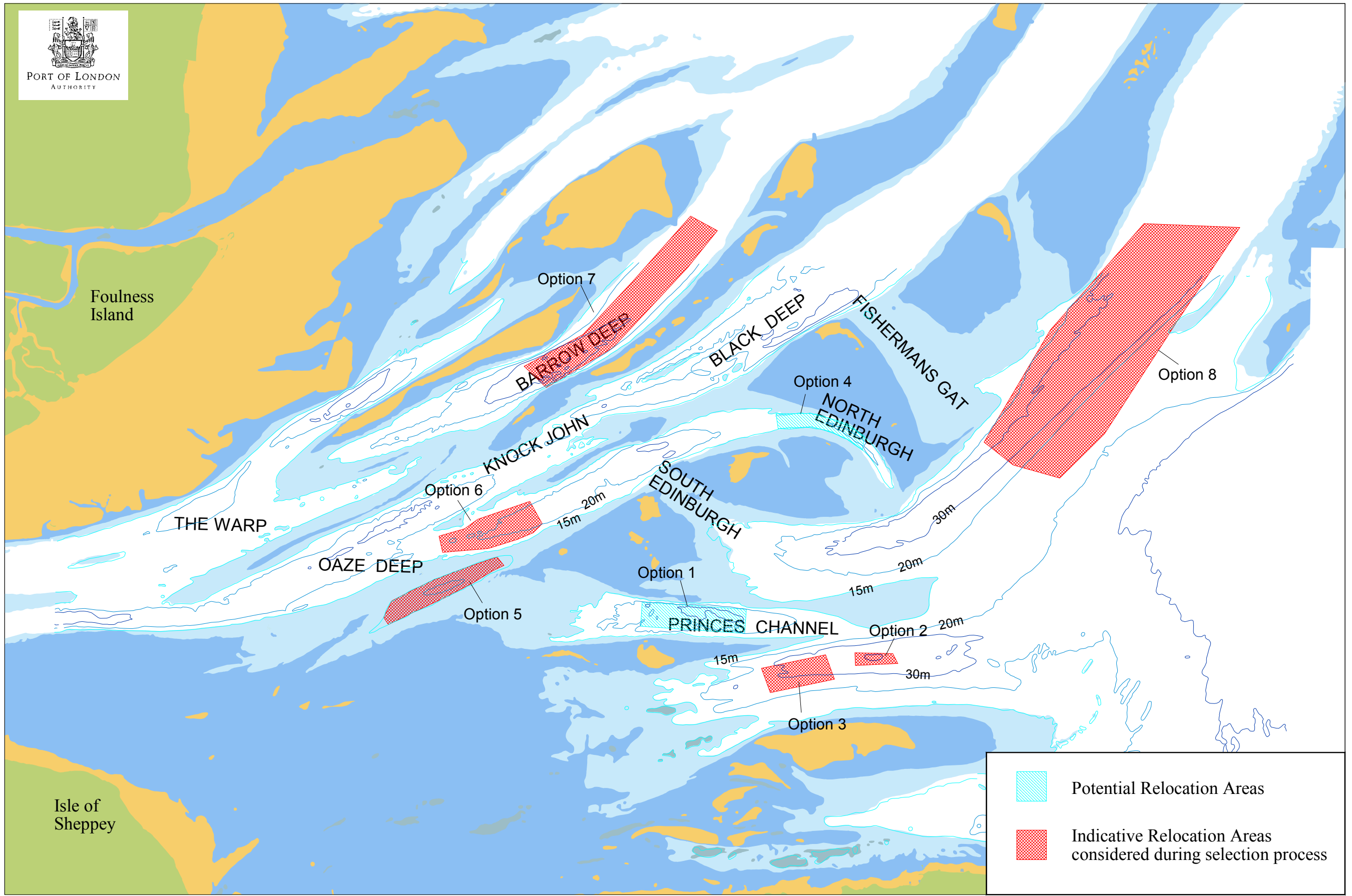
The PLA is considering the option of retaining the dredged material within the outer Thames Estuary by relocating the sand from the western part of Princes Channel to a local area in deeper waters. A number of potential relocation areas were considered and one has been selected for further study. Figure 2 shows these areas. The preferred option is in the North Edinburgh Channel. One other option is considered viable, this being Princes Channel East. Both sites are located at comparable distances from the dredge site. A discussion of the alternative areas considered and the selection process is given in Section 2.



Scale 1:300,000

PLA Hydrographic Service

Figure 1 Approaches to the Port of London



Scale 1:150,000

PLA Hydrographic Service

Figure 2 Potential Relocation Areas

### 1.3 Study Area

Princes Channel is located in the southern part of the Thames Estuary approximately 13km off the north Kent coast. Princes Channel is oriented in an east-west direction and runs parallel to the coast between Margate and Herne Bay. The channel is bordered by drying sand banks and shallow waters typical of the Thames Estuary. Existing water depths in Princes Channel range from more than -20.0m in the east to the much shallower western section with limiting depths of -6.3m (following the Phase I dredge). The relocation areas have been chosen as having water depths of greater than -15m and, for one option, (the Hole), water depths reach -30m.

The Port of London is in the top three ports in the country in terms of cargo tonnage and the Thames Estuary correspondingly has a very high density of shipping with more than 30,000 movements per annum. Of these movements, 45% are via Princes Channel (and include arrivals and departures to both London and the Medway ports; Polaris, Drewry 2003). A lesser percentage of vessels use Black Deep (the main deep water channel) and Barrow Deep. The diversity of shipping using the port is wide and includes oil tankers, container ships, Ro-Ro, aggregate dredgers and many more.

The Thames Estuary hosts important shellfisheries including cockles, flat oysters and mussels and the area is designated as Shellfish Waters under the Shellfish Waters Directive. Figure 3 shows the environmental designations in the outer Thames estuary. The area also provides shelter for juvenile fish and is a recognized spawning ground for commercial species such as sole and herring. The banks and some of the channels in the outer Thames Estuary are fished for sole using nets and trawls respectively. Consultation with local fishermen has indicated that while the surrounding banks are fished for sole, Princes Channel itself is not actively fished.

Much of the north Kent Coast is designated as a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar site for its bird interest, but these protected areas do not extend significantly offshore (see Figure 3).

Recreational navigation is also an important activity in the study area with inshore waters used for other waterborne activities including windsurfing and personal water craft (PWC).

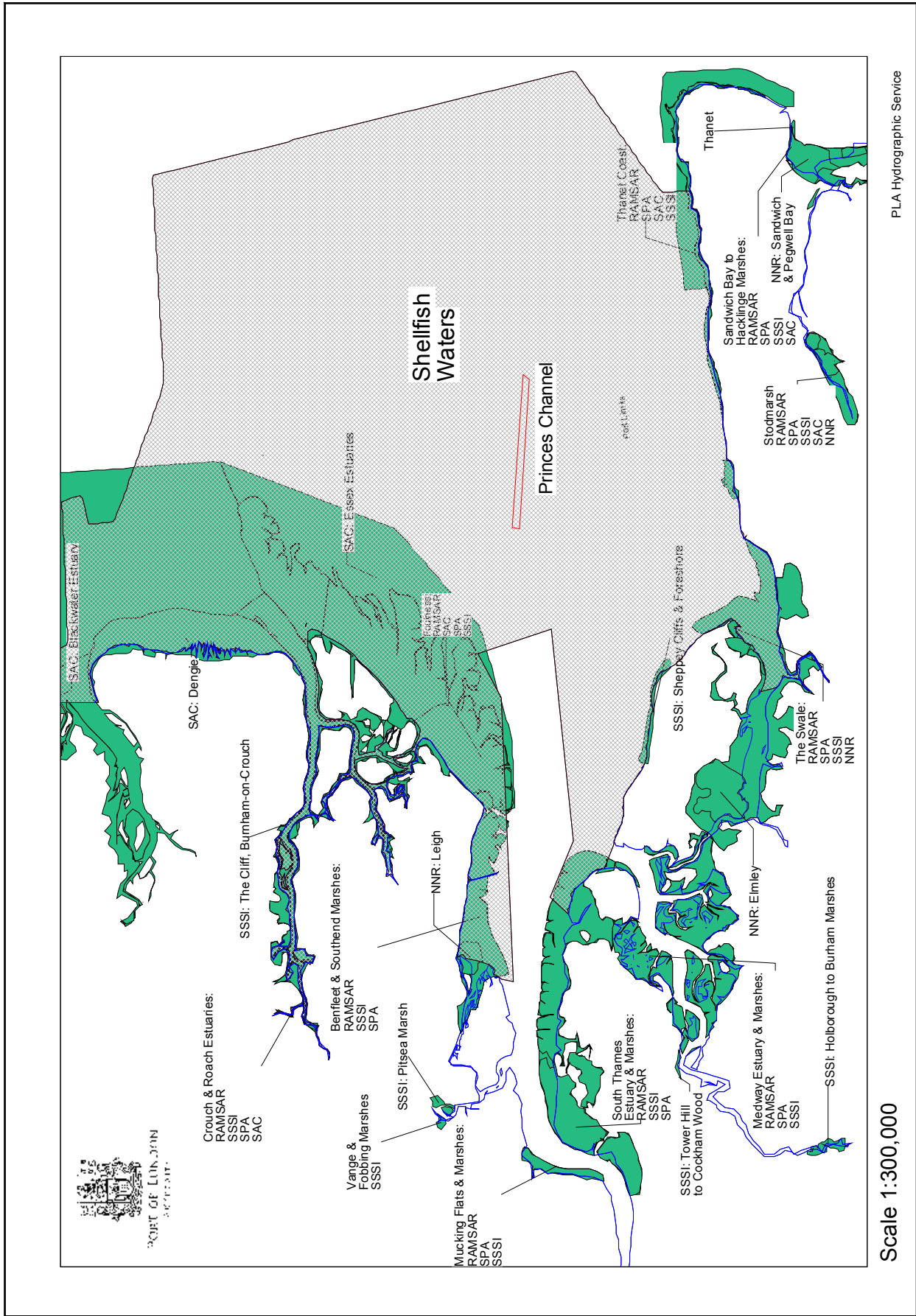


Figure 3 Environmental Designations in the Outer Thames Estuary

## **2 PROJECT DESCRIPTION**

### **2.1 Princes Channel Deepening**

The deepening of Princes Channel is described in the Princes Channel Development Environmental Review (PLA, 2003) but for completeness a description is included in this section.

Southern access to the Port of London has, for many years, been provided by the North Edinburgh Channel, Princes Channel and, more recently, the Fisherman's Gat. The seabed of the Thames Estuary in these areas is in constant flux, and water depths and channel centrelines are continually changing. Historically, there has always been a southern access route to the main entrance channel of the Thames with a minimum channel depth in the region of -7.0 to -8.0m. Currently, this is provided by the Fisherman's Gat, but there are signs that this access is unstable, and recent traffic risk assessment studies (Marico, 2002) have shown that the necessity for vessels to cross busy shipping lanes when entering from this point is not desirable. To address this issue, the PLA has been recommended to consider greater flexibility for access by smaller vessels to the Port and to develop alternative routes to remove the double-crossing situation that exists at the upper end of the Knock John Channel and Black Deep at its confluence with Fisherman's Gat.

Much of the existing Princes Channel is already relatively deep with water depths of, typically, -11.0m to -14.0m CD and as much as -20.0m CD in places. However, towards the western end of Princes Channel, depths are more typically between -5.6m and -8.0m CD, and it is in this area that dredging will be required to achieve the target depth of -8.0m CD throughout. Further, immediately to the west of this, dredging through a part of Shivering Sands (currently at around -6.0m to -8.0m CD) will also be required.

Subject to confirmation of the sustainability of the Channel following the completion of Phase I, Phase II will take the Channel to the desired depth of -8.0m. Once at this depth the southern access route will be restored and the navigational risk reduced from the current level. The quantity of material to be removed during Phase II is estimated to be in the region of 2.5 million m<sup>3</sup>.

### **2.2 Relocation Options**

The PLA is committed to finding beneficial use for as much of the dredged material as practicable and is currently holding discussions with interested parties. There is a possibility, however, that a beneficial use may not be found in the relevant timescale (see Section 2.5) or that some of the dredged material may not be suitable for beneficial use. Should these circumstances occur, then an alternative solution will be required. Ideally, this alternative should permit the

dredged material to be put in the same sedimentary cell that contains the channel. Princes Channel is part of the complex area of channels and banks over which water flows when it is leaving or entering the Thames Estuary from the East and South. It is well known that these channels (Princes, Fishermen's Gat, the Edinburghs etc.) change depth fairly regularly, as do the sand banks that separate and surround them (D'Olier, 1998). The seabed in this area is, thus, known to be mobile. Opportunities therefore exist to relocate dredged material to suitable zones in this area, where the material can then be re-cycled within the sedimentary system.

### **2.3 Discussion of Alternatives**

Five alternative areas and two different deposition methods (bottom placement and thin layer spreading) were considered as shown in Figure 2. These areas were initially selected based on hydrodynamic parameters and water depths. An assumption was made that sandbanks and shallow areas would not be considered due to the sensitivity of these banks for shellfish or fishing activity, i.e. for sole. Navigation requirements for minimum depths influenced the selection of area with depths of >15m.

Options 5, 6, 7 and 8 were quickly discounted due to the relative importance of these areas for fishing and the proximity to the proposed London Gateway dredging areas (and hence the inherent potential for cumulative effects). Options 2 and 3 were discounted during discussions with the fishing industry as being important fishing grounds for vessels from Whitstable and nearby ports. Following discussion with the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), the method of thin layer spreading (dispersion of dredged material into the water column to form a thin layer on the seabed) was also discounted due to the difficulties in demonstrating the effects of such a technique. CEFAS advised that, without prejudice to the outcome of an environmental assessment, there is an advantage in confining impacts because monitoring can be carried out to show the effects.

Following a meeting and discussions with representatives of Kent and Essex Sea Fisheries Committee (KESFC) and local fishing associations, a preferred option was selected by the fishing industry. This option is the North Edinburgh Channel (Option 4, see Figure 2). The fishing industry representatives also confirmed that no fishing activity occurs in Princes Channel East (Option 1) but that the adjacent banks are fished.

Given the above, the PLA has taken the advice of the fishing industry and selected the North Edinburgh Channel as its preferred option, subject to the findings of an environmental assessment. Princes Channel East is considered potentially viable but will not be pursued further.

### 2.3.1 North Edinburgh Channel

The North Edinburgh Channel is presently the preferred option for the PLA due to its relative proximity to the dredged area and the advice from the fishing industry that the area is not heavily fished. In addition, the existing dynamic nature of the channel and its adjacent sandbanks support the concept of recycling the dredged material within the sedimentary cell.

## 2.4 The Dredging and Deposition Processes

To achieve the desired depth of -8.0m CD it will be necessary to dredge the western section of Princes Channel. At the far western end, dredging through Shivering Sands will mostly be limited to less than 1m increasing to 1.6m. South of the Girdler, most of the dredging will be less than 1m but in localised areas up to 2.5m will be removed. No dredging is required between these two areas or to the east of the Girdler in the main body of Princes Channel as the depths are already at or below -8.0m CD. Figure 4 shows the areas to be dredged for Phase II.

The dredging will be carried out using a trailer suction hopper dredger (TSHD) and placement at the relocation area would be by discharge back down the dredge pipe or by bottom dumping. The material would be placed in such a way to ensure that the majority of the hopper load traveled directly to the seabed and did not become entrained in the ambient currents. Loads would be of the order of 3,000 to 5,000 m<sup>3</sup> per cycle initially, but could be increased in size if the dredger capacity was increased once the depths at the dredging site allowed. The loads would be placed accurately by GPS to ensure that a notional -10.00m CD channel depth was not infringed at any time.

The approach to the deposition process will be refined during the environmental assessment process to take account of any relevant environmental mitigation.



Figure 4 Phase II Proposed Dredge Areas

## 2.5 Programme

It is important that the PLA meets the recommendation for improving the safety of navigation in the southern approaches in as short a timescale as possible. However, given the current traffic levels and the high quality of vessel traffic management exercised by the PLA, the requirement is not yet essential, although it is becoming increasingly urgent. The PLA would wish to complete both phases of the dredging, from a navigation point of view, within the next three years. However, in order to avoid any potential in-combination effects with the London Gateway project, the programme ideally should commence in June 2004 with completion by the end of 2004. Should this not prove feasible and dredging has to continue beyond this period, close liaison will be maintained with the developers of London Gateway in order to co-ordinate dredging operations, and thus avoid potential conflict and possible in-combination effects.

This programme provides sufficient time for monitoring Phase I, carrying out any additional environmental work necessary for Phase II, and continuing to seek beneficial use (including obtaining sea disposal licences if required). The PLA has allocated ten months to complete the environmental assessment and consents process for the deposition of dredged material at North Edinburgh Channel. There is a large amount of existing information, gathered by the PLA (amongst others) to inform the assessment of the dredging, which will provide an excellent guide to the need for additional surveys (see Section 4). It is intended to undertake any additional survey work between September and December 2003.

### **3 LEGISLATIVE FRAMEWORK**

#### **3.1 Regulation of Dredging**

The general position elsewhere around the coast of England and Wales is for dredging undertaken for navigational purposes to be regulated by the Department for Transport (DfT) (via the Marine Consents and Environment Unit) under Section 34 of the Coast Protection Act 1949 (CPA).

However, within PLA port limits (see Figure 1) the arrangements are different and reflect both the need to respond rapidly to changes in available depths, and the historical importance and variety of sea trade entering London. As a consequence, the PLA has the powers both to carry out and to license dredging. These were given to the PLA under successive Port of London Acts (most recently PoLA 1968 s.60 and 73), and therefore dredging on the Thames is exempt from the provisions of s.34 of the CPA under s.35 of the same Act. The environmental effects of the dredging are described in the Princes Channel Development Environmental Review (PLA, 2003).

#### **3.2 Deposits At Sea**

Deposits at sea are regulated by the Department for Environment, Food and Rural Affairs (defra) under the Food and Environment Protection Act (FEPA) 1985 and a license is required under Section 5 of Part II for the disposal of dredged material at sea.

It is often the case that marine disposal takes place at existing licensed sites but there are examples of placement sites that have been licensed for short term or project-specific operations.

#### **3.3 Environmental Legislation**

The main environmental legislation relevant to the Princes Channel project is described below.

##### **3.3.1 Conservation (Natural Habitats &c.) Regulations 1994**

These regulations transpose the 1992 EC Habitats Directive into domestic law in England and Wales. There is a requirement to consider if a project is likely to have a significant effect on a designated European site and, if this test is met, to undertake an appropriate assessment to determine the effects of the project on the integrity of the site. In the UK, English Nature (EN) provides advice to government on the likely effects of projects on designated sites.

The Countryside and Rights of Way Act (CRoW) 2000 contains similar provisions to the above Conservation Regulations in that it provides protection for conservation sites designated under national legislation.

### 3.3.2 EIA Directive

There are currently no specific regulations that apply the EIA Directive to applications under FEPA, although these are in preparation. In the absence of such regulations, the PLA is preparing an environmental assessment based on the requirements for the provision of environmental information in the FEPA. The PLA will request that Defra provide guidance on the procedure to be followed as part of their Scoping Opinion.

The PLA has prepared the Scoping Report internally and will arrange and over see any necessary survey work. However, it is possible that the environmental assessment may be carried out by an independent environmental consultancy.

Consultation with key stakeholders was initiated during Phase I of the Princes Channel Development. This consultation will be extended to include other interested parties as necessary, and will continue throughout the EIA process

### 3.3.3 Shellfish Waters Directive

The Shellfish Waters Directive (SWD) applies to coastal or brackish waters which need *“protection or improvement in order to support shellfish (bivalve and gastropod molluscs) life and growth and thus to contribute to the high quality of shellfish products directly edible by man”*. The Directive sets water quality standards which must not be exceeded by pipeline discharges and defines sampling and monitoring requirements for compliance.

Part of the Thames Estuary is one of more than 100 designated Shellfish Waters in the UK (Figure 3). Others include Southampton Water and the Solent, the Humber Estuary, Liverpool Bay, Swansea Bay, Milford Haven and Morecambe Bay. Poole Harbour, Portsmouth Harbour and the Fal estuary, and many other areas of importance for port and recreational navigation also have designated waters.

The PLA will seek guidance from Defra, as part of its request for a Scoping Opinion, on how the SWD should be applied to the deposit of dredged material at sea.

## **4 CHARACTERISATION OF RELOCATION AREAS**

### **4.1 Introduction**

The deposition of dredged material can have a number of potential effects and impacts on the marine environment. These effects can include the following general examples:

- Short or long term physical changes to the topography of the seabed and/or local hydrodynamic regime;
- Increases in suspended solids in the water column and associated impacts on water quality, fisheries (including juvenile fish) and other marine organisms;
- Smothering and loss of benthic organisms (including shellfish) by direct placement or due to the erosion of the deposited material;
- Introduction of contaminants to the water column;
- Change in benthic habitats due to the placement of a different material type or material with different contaminant or organic composition; and
- Interference with fishing activity due to loss of change in fishing grounds or local disturbance to fish stocks.

The above list is not comprehensive and the environmental assessment will determine the relevance and extent of such impacts to these proposals. However, the nature of the potential impacts demonstrates the requirement to fully characterise the physical, biological and human environments in the placement location in order to provide the baseline against which predicted effects can be quantified.

A significant number of surveys have already been undertaken for the PLA in the Princes Channel area, and this data will be made available to inform the environmental assessment process. Sections 4.2 to 4.5 below describe the existing data and information that is considered relevant to the proposed placement locations and identify the additional data required to inform the environmental assessment.

In addition, the Thames Estuary is one of the strategic areas identified by the Department of Trade and Industry (DTI) for renewable energy generation and a strategic environmental assessment has been carried out for the area. This SEA will assist in informing the environmental assessment for these proposals.

### **4.2 Physical Characterisation**

#### **4.2.1 Physical and Chemical Properties of Dredged Material**

The physical and chemical properties of the dredged material have been established during Phase I of the Princes Channel Development, but further characterisation will be necessary (PLA, 2003). Figure 5 shows the location of

the existing samples and borehole data. This characterisation will comprise a vibrocore survey within the footprint of the dredged channel. Detailed physical analysis of depth and surface samples will provide information on the suitability of the material for beneficial use. Surface samples will be taken from the vibrocores to allow a comparison with the material forming the surface seabed at the placement site.

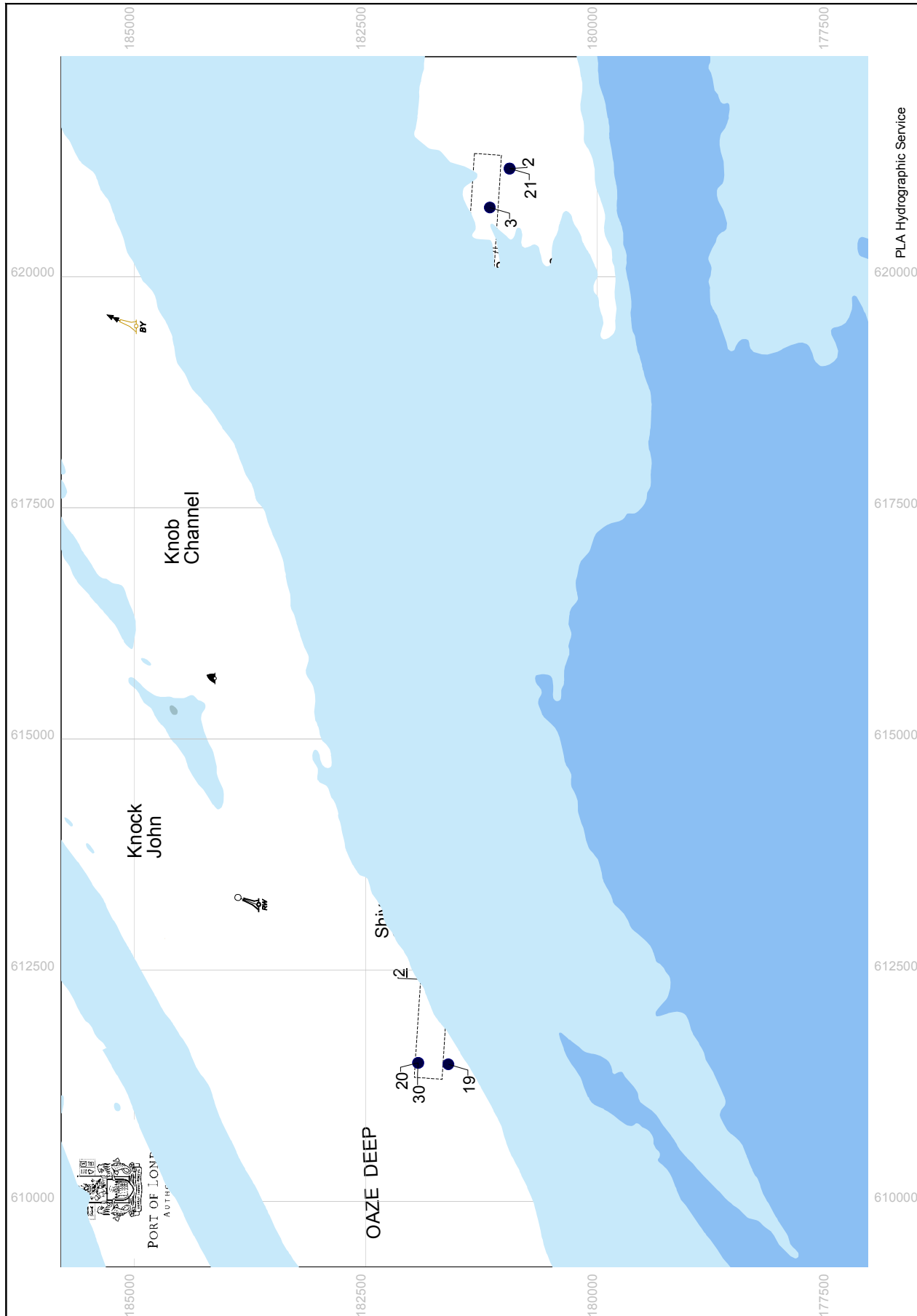


Figure 5 Existing Sediment and Water Quality Sampling Locations

Surface and depth samples will be analysed for chemical quality including a suite of heavy metals and TBT. The previous two sampling regimes found that levels of organic and microbiological parameters were either below detection limits or within acceptable levels, and so, it is not intended to analyse for these parameters. The number and distribution of samples will be agreed with CEFAS prior to the survey commencing.

#### 4.2.2 Morphological Change

An analysis of historic charts from 1775 – 1996 was carried out in 1998 by Brian D'Olier. In addition, there are numerous reports (including consultancy reports and PhD theses) which have studied the evolution of the sand banks in the outer Thames Estuary. These reports will inform the baseline description of the past and potential future evolution of the placement area.

#### 4.2.3 Physical and Chemical Properties of the Seabed at the Placement Area

A sediment sampling regime is proposed to coincide with the required marine biological survey (Section 4.3). Figure 6 shows the area to be sampled during this survey. A grab (Day or Hamon) will be used to take samples of surface sediments and analysis will be carried out for the following parameters:

- Organics: PAH Screen by HPLC, PCBs (ICES 7 Congeners) and total hydrocarbons;
- Metals: arsenic, cadmium, chromium, lead, mercury, copper, nickel, zinc and silver;
- Pesticides: DDT, Dieldrin, Lindane, Aldrin, Endrin, Isodrin and Parathion;
- Tributyl Tin (TBT) and Dibutyl Tin (DBT);
- Microbiology: Faecal coliforms or e-coli, Faecal streptococci and Faecal clostridia;
- Particle size; and
- Total organic carbon.

The survey methodology and the number and distribution of samples will be agreed with CEFAS prior to the survey commencing.

Data on selected water quality parameters including suspended solids and dissolved oxygen has been collected for the area around Princes Channel (see Figure 5 for water monitor locations). Monitor 3 has been in place for a seven month period from February to August 2003. It is considered that, due to its proximity, this dataset is applicable to the proposed relocation area.

#### 4.2.4 Current Profiling

There is no existing Acoustic Doppler Current Profiler (ADCP) data relating to the preferred option of North Edinburgh and a further ADCP survey will be necessary to characterise the current regime. Figure 7 shows the position of the previous survey tracks and the proposed additional survey tracks.

#### 4.2.5 Short and Long-term Fate of Deposited Material

It will be necessary to demonstrate and quantify the movement (if any) of the deposited material away from the placement site both over the short and long term. Material may be re-suspended during the placement process, due to entrainment in the water and upon impact with the bed, or, entrainment or bed load movement may occur during periods of high current velocities. Process modelling of the dredging operations will determine the characteristics of the materials to be placed in the relocation areas. The movement of these can then be assessed using dynamic plume modelling, and conventional sand erosion and deposition modelling in the framework of the existing hydrodynamic flow model (developed to inform the PLAs Princes Channel Development).

### 4.3 Biological Characterisation

The existing marine biological surveys carried out for Princes Channel and for the proposed London Gateway development included four grab samples from within the study area and a greater number of samples from the wider area. This is shown on Figure 6 where the red box identifies the area to be subject to a more detailed marine biological survey (although this study area will be extended to cover the tidal excursion). In addition, there is one trawl site from within the study area and trawl data is available for February, April and August 2003.

Figure 8 shows the composition of the biomass found in the previous marine biological survey (MES, 2002). The samples within the study area vary from a high percentage of crustacea with a low percentage of polychaetes (sample 1) to an almost equal split between these two species groups in Sample 10. MES concluded that the organisms from the survey area belonged to a number of separate faunal groups (MES, 2002). The environmental assessment will contain a detailed description of the existing and future survey data and the individual MES reports have been submitted to CEFAS with this Scoping Report.

The proposed survey will complement the existing data and will be carried out in September 2003, a time of high biological productivity. The survey will comprise grab samples and trawls with methodology comparable to that previously used. The detailed survey specification (including analytical methods) will be approved by CEFAS and the EA prior to the survey commencing.

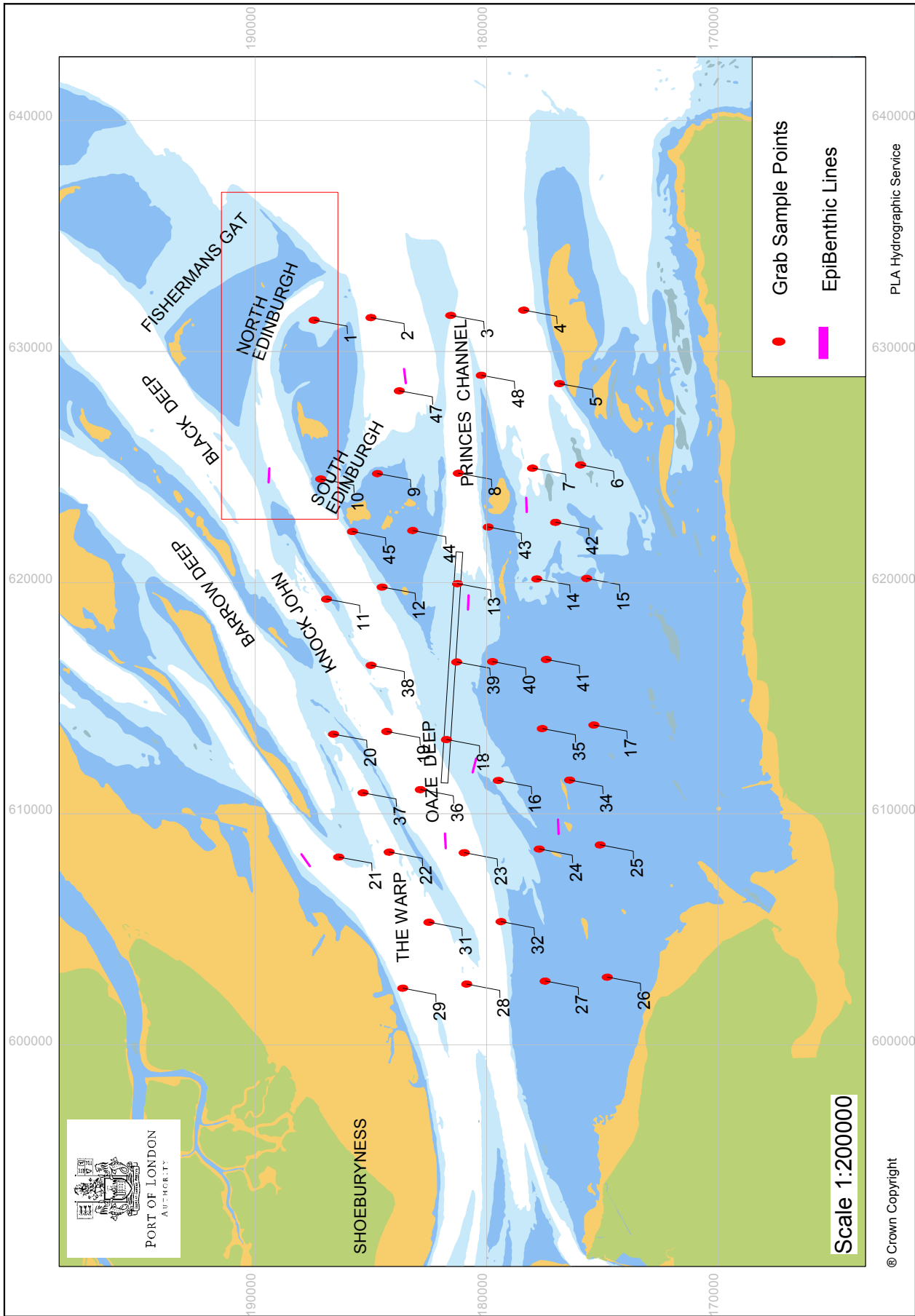


Figure 6 Existing Marine Biological Survey Sampling Locations and Proposed Study Area

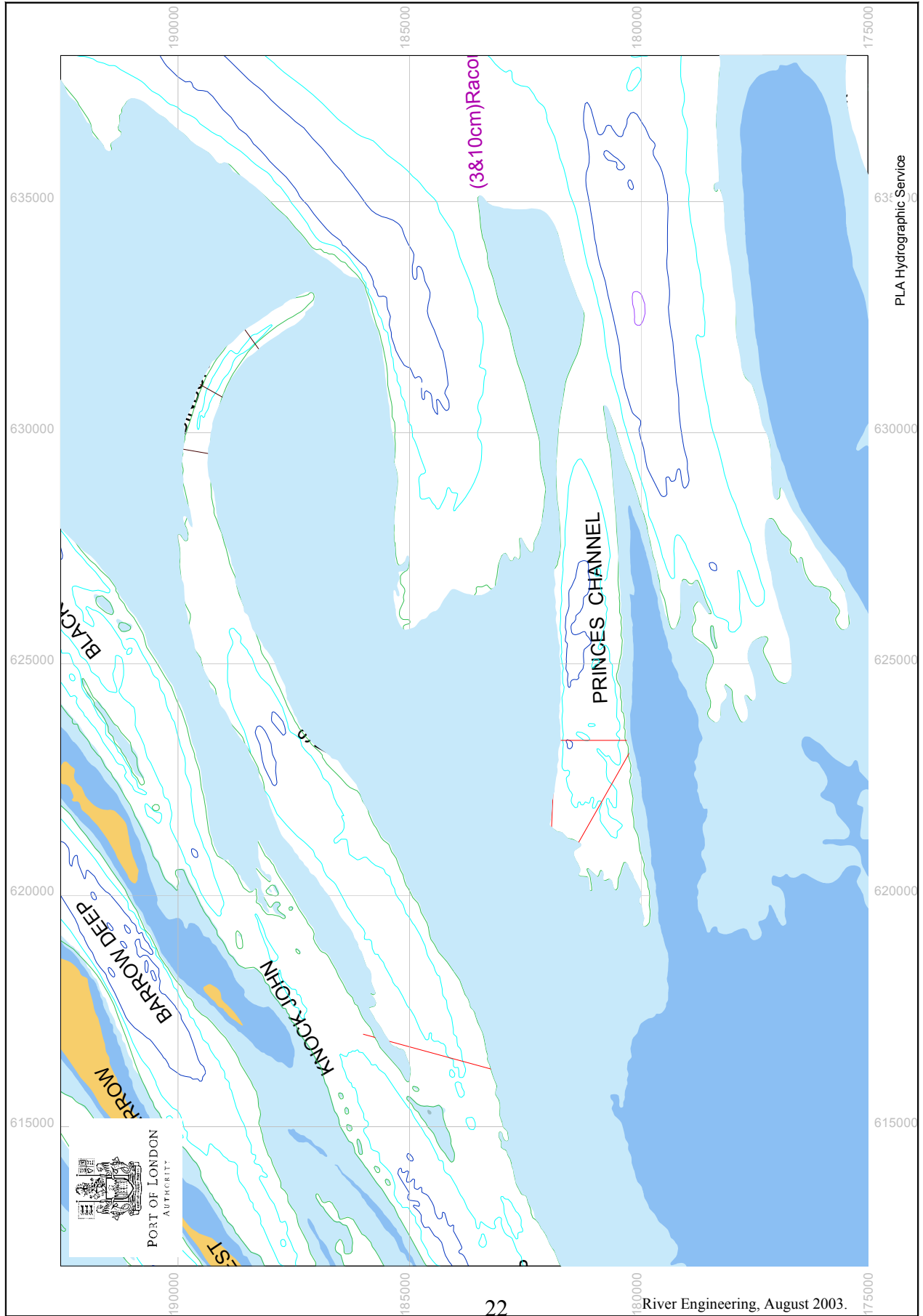
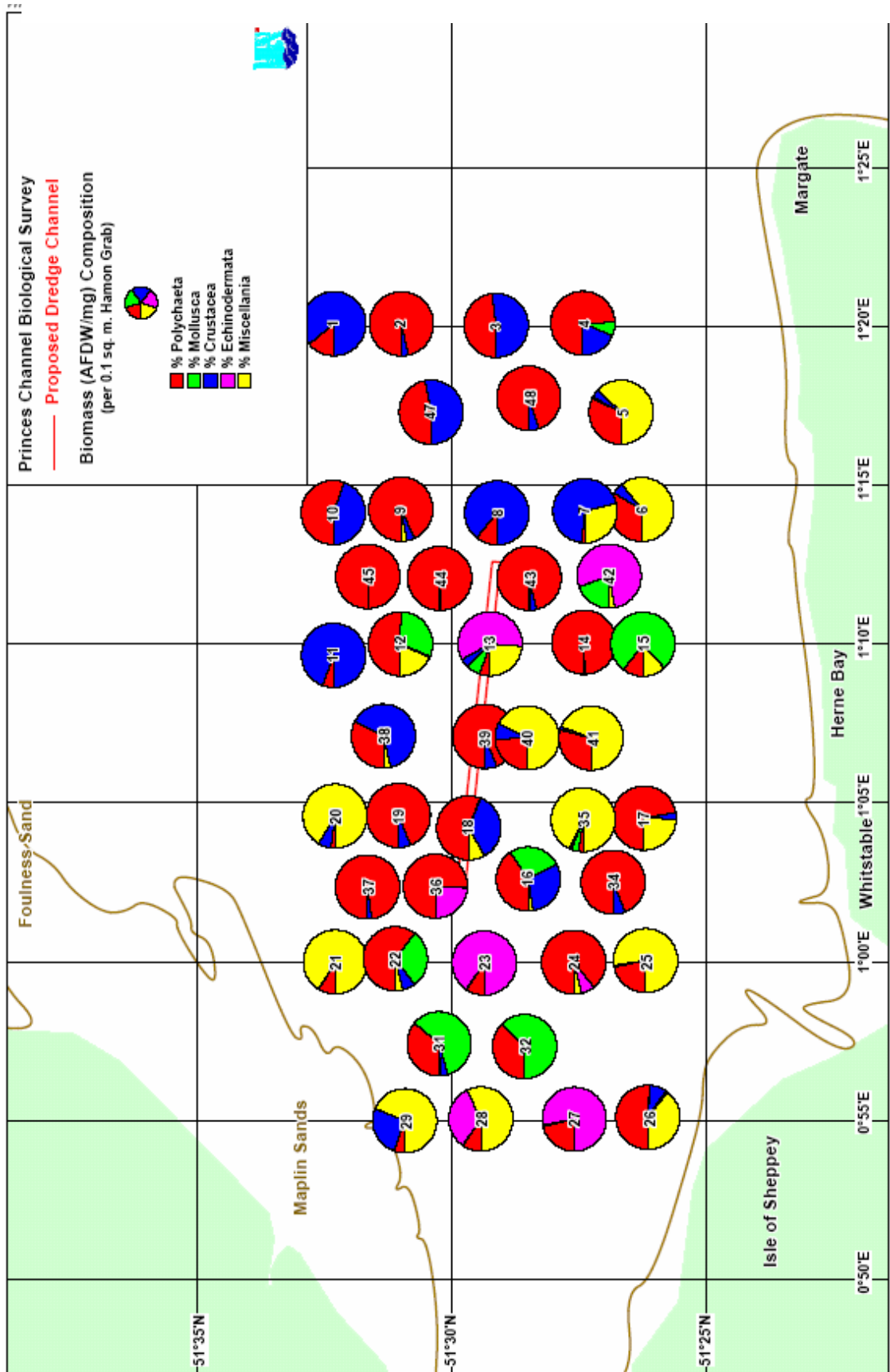


Figure 7 Existing ADCP Tracks and Proposed ADCP Track



#### **4.4 Characterisation of the Human Environment**

This part of the Thames Estuary is predominantly used by medium draughted commercial ships entering and leaving the Port of London or Medway, fishing vessels and recreational vessels. There is no aggregate extraction or oil and gas activity in this area. The construction of an offshore windfarm will shortly commence on Kentish Flats and the Thames Estuary has been selected as a strategic area for Round 2 of DTI's offshore renewable energy initiative.

The PLA's wrecks database together with consultation with English Heritage will provide information on any archeological features of interest within the relocation areas. In addition, an archaeological assessment is being carried out for the dredging operation and this will be extended to cover the proposed deposition site.

It is anticipated that continuing and widening the consultation begun during Phase I of the Princes Channel Development will provide the input for an assessment of the effects on the human environment. No specific surveys are proposed.

#### **4.5 Cumulative and In-combination Effects**

The EIA will need to consider, and where possible avoid, cumulative effects with other projects and activities in the area. The assessment will consider geographic, temporal and spatial interactions. Existing projects that will be considered in the cumulative effects study include the Princes Channel dredge, London Gateway Development and the Kentish Flats windfarm. If sites for Round 2 windfarms are known then these will also be included.

#### **4.6 Consultation**

During the Environmental Review process for the Princes Channel Development, the stakeholders shown in Table 1 were consulted and meetings held with each party. Informal consultation for the relocation proposals has been carried out with CEFAS and KESFC (and individual fishermen). Detailed consultation, using the Scoping Report as a basis for comment and discussion, will commence in early September 2003.

Table 1 Stakeholders and Regulators to be Consulted during Scoping

Stakeholder/Regulator	Area of Interest/Responsibility
English Nature	Designated conservation sites and biodiversity.
CEFAS	Advice on dredging, sea disposal, sediment quality and fisheries.
Environment Agency	Water quality, Shellfish Waters, sediment quality and fisheries.
Kent and Essex Sea Fisheries Committee (KESFC)	Fisheries and fishing activity

The following stakeholders will be consulted, in addition to the stakeholders shown in Table 1.

- English Heritage/RCHME;
- Royal Yachting Association;
- Fishermen’s organisations (as recommended by KESFC/SFI);
- Sea Fisheries Inspectorate;
- RSPB;
- Local diving clubs;
- Crown Estate;
- Medway Port; and
- Local Authorities.

Additional consultees may be highlighted as a result of Defra’s consultation on this Scoping Report.

## 5 SUMMARY OF SCOPING REQUIREMENTS

### 5.1 Scoping Requirements

Table 2 summarises the survey work necessary to inform the environmental assessment. All survey specifications and methodology will be agreed with CEFAS.

Table 2 Proposed Marine Surveys

Survey/Work Description	Comment
<b>Dredged material characterisation</b>	Surface and depth samples to be taken during a vibrocore survey and analysed for a suite of heavy metals, TBT and particle size.
<b>Placement site seabed characterisation</b>	Surface samples will be collected and analysed for a suite of heavy metals, TBT, organics, pesticides and microbiological parameters as described in Section 4.2.3.
<b>Current profiling</b>	ADCP survey on track shown in Figure 7.
<b>Fate of deposited material</b>	Process modelling of the dredging operations. Dynamic plume modelling. Sand movement using existing hydrodynamic model.
<b>Marine biological survey</b>	Survey comprising grabs and trawl sampling to complement existing data. Survey will cover area shown within red outline on Figure 6.
<b>Morphological change</b>	Desk study of existing literature.
<b>Consultation</b>	To be continued throughout EIA.

### 5.2 The Environmental Assessment Process

The key steps in the environmental assessment and consent process are outlined below:

- Prepare Scoping report August 2003
- Submit Scoping Report September 2003
- Commence written consultation September 2003
- Undertake marine biological survey September 2003
- Undertake ADCP survey November 2003
- Investigate fate of deposited material November 2003
- Vibrocore survey November 2003
- Assessment and reporting for env. report Jan – Mar 2004

- Submit FEPA application and final env. report      March 2004
- Gain consent      June 2004

It is the intention that the ongoing consultation process would ensure that issues and concerns are identified and addressed early on in the project timescale with the aim that the final environmental report, once submitted, would be acceptable to the key stakeholders.

## 6 RELEVANT REFERENCES

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