



# Rainham Lagoons Operations Plan

28th November 2006

Final Report

9R6801



A COMPANY OF



**ROYAL HASKONING**

**HASKONING UK LTD.  
ENVIRONMENT**

4 Dean's Yard  
Westminster  
London SW1P 3NL  
United Kingdom  
+44 (0)20 7222 2115 Telephone

info@london.royalhaskoning.com E-mail  
www.royalhaskoning.com Internet

Document title Rainham Lagoons Operations Plan

Document short title Rainham Operations Plan

Status Final Report

Date 28<sup>th</sup> November 2006

Project name Rainham Silt Lagoons

Project number 9R6801

Client Port of London Authority

Reference 9R6801/R/303366/Lond

Drafted by Tim Denton and Marc Pieris

Checked by Helen Dangerfield

Date/initials check *HRD 26.02.07*

Approved by Charles Haine

Date/initials approval *CHH 26.02.07*

## CONTENTS

		Page
1	PURPOSE OF DOCUMENT	1
	1.1 Structure of the Document	1
2	SITE DESCRIPTION	2
	2.1 Background	2
	2.2 Study Area	3
3	MANAGEMENT OBJECTIVES	4
	3.1 Operational Objectives for Management of the Lagoons	4
	3.2 Environmental Objectives	4
4	OPERATIONS	5
	4.1 Criteria for Material Properties	5
	4.1.1 Quality	5
	4.1.2 Grading	5
	4.2 Communications and Procedure Notification	5
	4.3 Placement of Dredgings	6
	4.4 Timing of Operations	6
	4.4.1 Seasonal Preferences	6
	4.4.2 Flood Risk Considerations	6
	4.5 Water Management Issues	6
	4.5.1 Water Quality	6
	4.5.2 Maximum Volume Per Day	7
	4.5.3 Condition of Ditches and Drainage System	7
	4.5.4 Control of Water Levels During/Post Pumping	7
	4.6 Health and Safety	8
	4.7 Summary Table	9
5	CONTACT DETAILS OF KEY STAKEHOLDERS	12
6	APPENDIX A (PRO FORMA)	14

## 1 PURPOSE OF DOCUMENT

The purpose of this Operations Plan is to provide an agreed procedure for the operational disposal of dredged material to the Silt Lagoons at Rainham. The plan has been produced in consultation with the Port of London Authority (PLA), the Royal Society for the Protection of Birds (RSPB), Natural England (NE) and the Environment Agency (EA).

The Plan has been produced:

- To meet the PLA's requirement, as occupier of part of the Inner Thames Marshes Site of Special Scientific Interest (SSSI), to fulfil their obligations to manage the SSSI and to manage placement operations of dredged material appropriately.
- To be a dynamic document to be updated regularly to reflect any changes in responsibility, legal requirements and operation.
- To be used in conjunction with other management documents including the Inner Thames Marshes Water Level Management Plan and the RSPB's Management Plan.
- To be used as a reference document referring to operational issues associated to disposal of material, this document is not for general management of the site.

### 1.1 Structure of the Document

The plan is structured into three main sections, covering the following issues:

1. Objectives;
2. Operations; and
3. Contact Details.

A pro forma has also been developed to be used with this Operations Plan to help ensure that agreed procedures are adhered to and that effective communication is maintained.

## 2 SITE DESCRIPTION

### 2.1 Background

The Rainham silt lagoons have provided a disposal facility for dredged material arising from the Thames Estuary since the 1960s. The original lagoon structures, comprising lagoons 1-7, were constructed by the PLA in the late 1960s. These were supplemented in 1982 with the addition of an additional two lagoons, lagoons 8 and 9.

Historically, dredgings from the Thames were taken to a number of marine disposal sites. Following a review of dredging disposal policy in the mid 1960s, disposal has been undertaken at the main marine site, South Falls, and at the two terrestrial disposal sites at Cliffe (north Kent) and Rainham. However, since the late 1980s, an increasing proportion of maintenance dredging has been undertaken using water injection equipment, and this has led to a corresponding reduction in the quantities being taken for disposal to the two onshore sites.

Both sites are of significant ecological interest. Cliffe lies within the Thames Estuary and Marshes Special Protection Area (SPA), and is owned and managed by the RSPB.

The Rainham Marshes are owned by Defence Estates (MOD) who leases the area to the RSPB. The disposal lagoons comprise a section of the Marshes area and are sub-let to the PLA, for dredge disposal. The PLA in turn licence the operation of the site through Westminster Dredging Company Ltd. (WD).

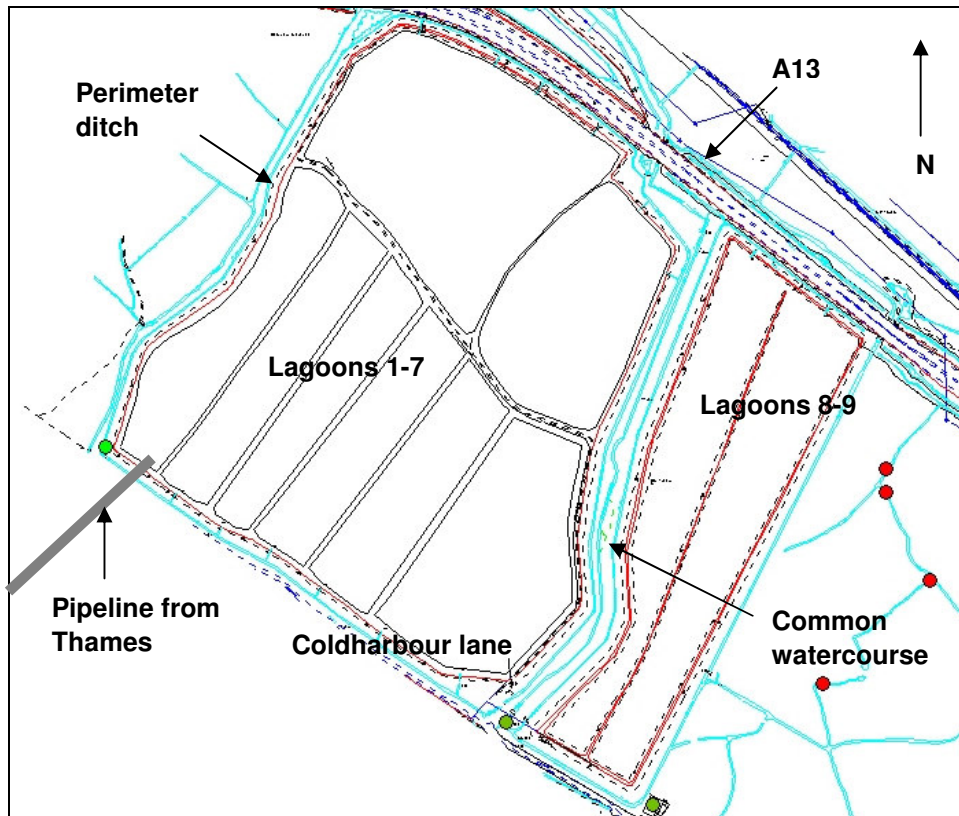
The disposal lagoons are recognised as having significant national environmental value and are designated as part of the Inner Thames Marshes Site of Special Scientific Interest (Ref 1000113 - Appendix 9.1). The RSPB and NE have agreed management objectives for the Rainham Marshes SSSI. These include conservation targets for the disposal lagoons.

The disposal of material to the site is licensed under a Waste Management Licence, This licence is currently under review, with an anticipated annual reception capacity of up to 350,000 tonnes of sited material (solids), excluding the water used to carry the material to the lagoons.

## 2.2 Study Area

The site consists of nine lagoons covering a total area of 152 ha. They are centred on OS grid reference TO 5526 1808 and located on the floodplain of the Thames Estuary, 0.5km north of the River itself and 1km south of Rainham town centre (Figure 2-1).

**Figure 2-1:** Site plan showing lagoon layout.



(Source: Adapted from RSPB Management Plan, June 2006)

The lagoons are bounded to the north by the A13 bypass, to the west by Rainham Marshes (derelict grazing marsh), to the east by Wennington Marshes (primarily managed grazing marsh), and to the south by a landfill site operated by Veolia ES Cleanaway (UK) Ltd. The site falls within Havering Borough Council's area.

### 3 MANAGEMENT OBJECTIVES

#### 3.1 Operational Objectives for Management of the Lagoons

The operational objective of the site is to provide an on-land disposal site suitable for inert arisings from marine dredging operations within the tidal Thames and its tributaries and docks. The site accepts all grades of dredge arisings (from clay to gravel) and accommodates both maintenance and capital arisings. Currently the material is deposited hydraulically via a pump ashore system. The capacity of the site is defined by the ultimate target heights for the lagoons, set at +5.9m above Ordnance Datum for lagoons 1 to 7, to the west, and +6.2m above Ordnance Datum for Lagoons 8 and 9. The residual void as of December 2006 is calculated to be 1.5 million cubic metres, of which approximately 33% is identified within Lagoons 8 and 9.

#### 3.2 Environmental Objectives

The lagoons are designated as part of the Inner Thames Marshes SSSI, which is of particular note for its diverse ornithological interest and especially for the variety of breeding birds and the numbers of wintering wildfowl, waders, finches and birds of prey, with wintering teal populations reaching levels of international importance. Recent research has highlighted the importance of the sand and gravel substrate for Thames Terrace Invertebrate such as *aculeate hymenoptera* (solitary bees/wasps).

The discharge of sediment and river water into the lagoons produces a changing complex of dry habitats such as scrub and Thames Terrace grassland, or flooded mud flats and developing saltmarsh.

The conservation objective while dredging operations continue is to maintain as far as practical the designated features within the lagoon (the habitat for wintering wildfowl and roost sites for waders) while recognising that the primary use of the facility is as a commercial disposal site. Changes in dredging practice within the Thames have had an impact on the frequency of disposal operations, with a corresponding impact on the environmental condition of the site. The PLA should therefore actively encourage the use of the site, where possible and economically practical, and where such activity does not conflict with environmental management strategies for the SPA and SAC sites within the Lower Thames, (for which the sediment budget, based on current dredging activity, is assessed as neutral).

It is recognised that the long term management of the lagoon area may need to be structured to provide priority areas of favourable habitat, coupled with the transformation of areas to provide alternative, albeit valuable, habitat of a different form. The determination of the long term ecological habitat within the marshes, post cessation of dredging, is the responsibility of the RSPB. However, the management of this transformation should be undertaken through the coordinated activities of the RSPB and the PLA, and WD as the operator.

## 4 OPERATIONS

### 4.1 Criteria for Material Properties

#### 4.1.1 Quality

Material to be deposited within the lagoons should be free from contamination and should meet the criteria set for marine disposal of similar sediments, based on CEFAS and/or PLA (as harbour authority) current criteria for dredging operations. Sampling and testing of all capital dredging areas must be undertaken prior to commencement. Sampling and testing of maintenance dredge areas should normally be undertaken at 2 year intervals, in accordance with the PLA's Dredging Conservation Assessment.

#### 4.1.2 Grading

The approximate grading of materials to be deposited should be established prior to commencement of dredging. Where practical, a mix of materials suitable for subsequent landscaping works should be included in the profile adjacent to final design levels.

### 4.2 Communications and Procedure Notification

Under the terms of the lease between the RSPB and PLA, the PLA (or WD as the operator) must give a minimum of three days warning of the commencement of operations to the PLA and RSPB. It is recommended that this be modified by this management plan to the following:

- Insofar as is reasonable and practicable, PLA to provide RSPB a rolling programme of dredging activity involving disposal to land, providing indicative timing and quantities as estimated. Programme should also be provided to the EA and NE. The programme should focus on activities within periods of:
  - 3 months,
  - 3 to 6 months,
  - to 12 months

The programme should be issued **quarterly**.

- As soon as possible (**1 month would be preferable**) prior to a dredging campaign, WD to complete pro forma (Appendix A) and provide to PLA. PLA to consider and circulate to RSPB, NE and EA. It is recognised that dredging operations may be required at short notice.
- As soon as possible (**2 weeks would be preferable**) prior to dredge, WD to confirm commencement date to PLA, who will circulate to RSPB, NE and EA.
- **3 days** prior to dredge, WD to confirm to PLA mobilisation of plant.

- WD to provide **annual** return to PLA on dredges undertaken (included on pro forma).

### 4.3 Placement of Dredgings

The PLA and RSPB will agree on an overall management framework document for the site, which will include a section on the placement of dredgings. The location for the deposited material for each campaign will be considered and determined in the context of this document.

### 4.4 Timing of Operations

#### 4.4.1 Seasonal Preferences

There is a preference for any water levels within any habitat areas within the lagoons to be seasonally variable, with highest water levels in winter, and falling levels throughout Spring, Summer and early Autumn. Wherever possible, dredging disposal or activities associated with maintenance of the bunds should not be undertaken if breeding birds are present, typically March to August, so as not to disturb breeding activity. The continuation of current disposal practice should therefore consider phasing maintenance dredging operations to follow this pattern, with major campaigns programmed for winter periods. However, the need to undertake regular dredging of berths and pumping operations is acknowledged; dredging operations are, to a degree, reactive and flexibility in undertaking campaigns must be maintained. If dredging disposal is required during the bird breeding season a survey should be undertaken to determine the most sensitive lagoons and avoid these where possible. Vegetation which develops on the surface of the lagoons (not on the bunds) between dredging campaigns should not be cleared prior to a dredging campaign.

#### 4.4.2 Flood Risk Considerations

The PLA and WD should liaise closely with the EA when planning pumping activity to minimise any potential adverse impacts associated with flooding.

### 4.5 Water Management Issues

#### 4.5.1 Water Quality

Water used to transport dredgings from the vessel hoppers to the site shall be drawn from the River Thames in the vicinity of the Rainham site. The PLA shall ensure that pumping is halted should there be concerns regarding water quality in the river (as a result of oil spill or extreme Combined Sewer Overflow event for example), if there is any chance of contaminating the transport water.

The discharge from the lagoons shall be controlled to ensure that the suspended sediment levels in the water entering the drainage system in the Marshes is in accordance with the criteria in the Waste Management Licence.

#### 4.5.2 Maximum Volume Per Day

The volume of material that the site can accept is dependent on the grading of the material in suspension. Coarser materials are more likely to cause water level management issues, since the volumes of water associated with the pumping operation are greater, and the settling time for the material is so short. In consequence, there is a tendency for discharge rates from the sluices to run at the maximum capacity of the marsh drainage system – around 60,000m<sup>3</sup> per day.

The limit on capacity for placement is set by the capacity of the receiving lagoon structure, since water is retained, rather than discharged.

#### 4.5.3 Condition of Ditches and Drainage System

The PLA, WD and the RSPB shall undertake a joint inspection of the ditches adjacent to the lagoons with sufficient notice to allow any remedial works to be undertaken. Responsibility for maintaining the ditches lies with both the PLA/WD (maintenance associated with siltation) and the RSPB (maintenance associated with vegetation and fly-tipping). The dredging contractor may be a participant in the clearing process, under the guidance of the RSPB. Veolia ES Cleanaway (UK) Ltd. has a responsibility to clear ditches and adjacent lagoons of rubbish which are adjacent to the landfill site.

All ditch management should be undertaken according to best conservation practice, and particular note should be taken of the area's status as an important site for water voles. NE has produced water vole guidance<sup>1</sup> for planners and developers which sets out best practice for water vole habitat management. Ideally ditch management should be undertaken on a rotational basis so as to avoid loss of habitat from a large length of ditch in any one operation.

#### 4.5.4 Control of Water Levels During/Post Pumping

Where practicable, sluice gates should remain closed during pumping campaigns. However, there may be a requirement to open the sluice gates when pumping particularly coarse material as this requires large volumes of water to mobilise. If lowering of the sluice gates is required, efforts should be made to lower adjacent gates simultaneously at a consistent level to prevent localised drawdown and the build up of ammonia within the receiving ditches. Sluices should also remain closed post-pumping to prolong water retention and to ensure an even flow of water.

---

<sup>1</sup> English Nature (2001) Water Vole Guidance for Planners and Developers

## 4.6 Health and Safety

WD shall at all times follow the guidance set out in its document entitled 'Health, Safety and Environmental (HS&E) Plan specific to Rainham Lagoons', the contents of which are outlined below:

- 1 Introduction
- 2 General information
- 3 Distribution of the plan
- 4 Organisation and responsibilities
- 5 Principal Contractor/Sub contractors/ Other contractors
- 6 HS&E Checklists Major Equipment
- 7 Safety/Environmental Training Personnel
- 8 Personnel Qualifications
- 9 Stickers/Billboards etc.
- 10 Safety/Environmental Induction of New Employees
- 11 Personal Protection Equipment
- 12 Risk Assessment
- 13 Project Emergency Instructions
- 14 Project end Report
- 15 References
- 16 Attachments
- 17 Alterations
- 18 Organisation Chart
- 19 Site Specific Instructions
- 20 Designers Health and Safety Plan Part 1
- 21 Risk Assessment forms/Waste Transfer forms/Environmental Non-conformance forms/Impact forms
- 22 Emergency contact List
- 23 Company Safety/Environment adviser CV
- 24 Distribution of Plan

The RSPB shall at all times be responsible for the security of the perimeter fencing and gates.

#### 4.7 Summary Table

Parameter		Requirement / Action	Responsibility
Criteria for Material Properties	<i>Quality</i>	<ul style="list-style-type: none"> <li>Material to be deposited should be free from contamination and should meet the criteria set for marine disposal of similar sediments.</li> <li>Sampling and testing of all capital dredging areas must be undertaken prior to commencement.</li> <li>Sampling and testing of maintenance dredge areas should normally be undertaken at 2 year intervals, in accordance with the PLA's Maintenance Dredging Framework.</li> </ul>	PLA/WD  PLA/WD  PLA/WD
	<i>Grading</i>	<ul style="list-style-type: none"> <li>The approximate grading of materials should be established prior to dredging taking place.</li> <li>Consideration should be given to the ultimate balance of materials within the upper layers of each of the lagoons, and targeted placement of mixed grading materials should be considered during the disposal process.</li> </ul>	PLA/WD  PLA/WD
Communications and Procedure Notification		<ul style="list-style-type: none"> <li>PLA to provide RSPB (and EA and NE) a rolling programme of dredging activity involving disposal to land, providing indicative timing and quantities as estimated.</li> <li>WD to update the programme monthly with any changes, or to confirm no changes to the broad programme.</li> <li>As soon as possible (1 month would be preferable) prior to a dredging campaign, WD to complete pro forma (Appendix A) and provide to PLA. PLA to consider and circulate to RSPB, NE and EA.</li> <li>As soon as possible (2 weeks would be preferable) prior to dredge, WD to confirm commencement date to PLA, RSPB, EA and NE.</li> <li>3 days prior to dredge, WD to confirm mobilisation of plant.</li> <li>WD to provide annual return to PLA on dredges undertaken (included on pro forma).</li> </ul>	PLA  WD  WD/PLA  WD  WD WD
Placement of		<ul style="list-style-type: none"> <li>WD is to agree with PLA and RSPB, within reasonable and practicable</li> </ul>	WD/PLA/RSPB

Parameter		Requirement / Action	Responsibility
Dredgings		limits, on the preferred location for the deposited material for each campaign. This should take account of quantity, grading and likely water discharge issues and must recognize the practical implications of, particularly, pumping coarse materials to the furthest extremities of the site.	
Timing of Operations	<i>Seasonal Preferences</i>	<ul style="list-style-type: none"> <li>• Wherever possible, dredging disposal should not occur if breeding birds are present (typically March to August).</li> <li>• The continuation of current disposal practice should consider phasing maintenance dredging operations to follow this pattern, with major campaigns programmed for winter periods, unless there is an immediate requirement for disposal.</li> <li>• If disposal is required during the bird breeding season a survey should be undertaken to inform least damaging disposal option.</li> <li>• Vegetation which develops on the surface of the lagoons (not on the bunds) between dredging campaigns should not be cleared prior to a dredging campaign.</li> </ul>	<p>ALL</p> <p>ALL</p> <p>ALL</p> <p>ALL</p>
	<i>Flood Risk Considerations</i>	<ul style="list-style-type: none"> <li>• The PLA and WD should liaise closely with the EA when planning dredging activity to minimise any potential adverse impacts associated with flooding.</li> </ul>	PLA/WD/EA
Water Management Issues	<i>Water Quality</i>	<ul style="list-style-type: none"> <li>• Water used to transport dredgings from the vessel hoppers to the site shall be drawn from the River Thames in the vicinity of the Rainham site.</li> <li>• The PLA shall ensure that pumping is halted should there be concerns regarding water quality in the river if there is any chance of contaminating the transport water.</li> <li>• The discharge from the lagoons shall be controlled to ensure that the suspended sediment levels in the water entering the drainage system in the Marshes are in accordance with the criteria within the Waste Management Licence.</li> </ul>	<p>PLA/WD</p> <p>PLA</p> <p>WD/EA</p>

Parameter		Requirement / Action	Responsibility
	<i>Condition of Drainage and Ditching System</i>	<ul style="list-style-type: none"> <li>The PLA, WD and the RSPB shall undertake a joint inspection of the ditches adjacent to the lagoons with sufficient notice to allow any remedial works to be undertaken.</li> <li>The dredging contractor may be a participant in the clearing process, under the guidance of the RSPB. Veolia ES Cleanaway (UK) Ltd. has a responsibility to clear ditches of rubbish which are adjacent to the landfill site.</li> <li>All ditch management should be undertaken on a rotational basis where feasible and according to best conservation practice. Particular note should be taken of the area's status as a key national site for water voles.</li> </ul>	<p>PLA/WD/RSPB</p> <p>Veolia</p> <p>PLA/WD/RSPB</p>
	<i>Control of Water Levels Post Pumping</i>	<ul style="list-style-type: none"> <li>Where possible, sluice gates should remain closed during pumping campaigns.</li> <li>If lowering of the sluice gates is required, where possible adjacent gates should be lowered simultaneously at a consistent level to prevent localised drawdown and the build up of ammonia within the receiving ditches.</li> <li>Sluices should also remain closed post-pumping to prolong water retention and to ensure an even flow of water.</li> </ul>	<p>WD</p> <p>WD</p> <p>WD</p>
Health and Safety		<ul style="list-style-type: none"> <li>WD to follow the guidance set out in its document entitled 'Health, Safety and Environmental (HS&amp;E) Plan specific to Rainham Lagoons' at all times.</li> <li>The RSPB to keep the perimeter fencing and gates secure at all times.</li> </ul>	<p>WD</p> <p>RSPB</p>

## 5 CONTACT DETAILS OF KEY STAKEHOLDERS

Body	Responsibility or Interest	Address	Key Personnel	Role
Environment Agency	Responsible for flood risk management and water abstraction licensing. Also concerned with water quality, conservation, recreation and licensing discharges	Apollo Court 2 Bishop Square Business Park St Albans Road West Hatfield AL10 9EX Tel: 01707 632477	<b>Katharine Samms</b>	<b>WLMP Project Manager</b>
			Jenny Ellis	Environmental Management
			Kelly Pottle/Daniel Burbidge	Water Resources
			Nadia Brannon	Development Control
			Karen Douse	Water Quality
			Sarah Boyd/Graeme McLaren	Fisheries and Biodiversity
			David Telford	Flood Defence heavy maintenance
			Dean Shelton	Flood Defence Inspector
			George Campbell	Flood Defence operations and WLMPs
			Mike Pomfrett	Operations Delivery Team Leader (East)
RSPB	Leaseholder from MOD for Aveley and Wennington Marshes and the Silt Lagoons. Management of that part of the Inner Thames Marshes SSSI	Unit 9 Thurrock Commercial Centre Juliette Way, Purfleet-on-Thames RM15 4YD Tel: 01708 892900	<b>Colin Bartholomew</b>	<b>Senior Warden</b>
			Nick Bruce-White	Site Manager
			Mark Underhill	South East Reserves Manager
Natural England	Responsible for nature conservation within the SSSI	Devon House 12-15 Dartmouth St Queen Anne Gate St James London SW1H 9BL Tel: 020 7340 4870	<b>Paul Losse</b>	<b>Senior Specialist Land Management</b>

Port of London Authority	<p>Hold a 50 year dredging disposal licence for the silt lagoons with RSPB.</p> <p>Land owner for the Veolia ES Cleanaway (UK) Ltd. landfill site.</p>	<p>London River House Royal Pier Road Gravesend Kent DA12 2BG Tel: 01474 562200</p>	<b>Katherine Harris</b>	<b>Environmental Assessor</b>
			Nicola Clay	Environmental Scientist
			John Ball	Head of Property
Westminster Dredging	<p>Operator, under contract, for the Silt Lagoons</p>	<p>Westminster House Crompton Way Segensworth West Fareham Hants PO15 5SS Tel: 01489 885933</p>	<b>Brian White</b>	<b>Operations manager</b>
			Leo Jansen	Dredging Manager
Veolia ES Cleanaway (UK) Ltd	<p>Ownership and management of landfill to south of lagoons</p>	<p>Coldharbour Lane Rainham Essex RM13 9YB Tel: 01708 632200</p>	Peter Wynn	

6 APPENDIX A (PRO FORMA)

RAINHAM LAGOONS PLACEMENT PRO FORMA	
<b>TO BE COMPLETED BY WESTMINSTER DREDGING</b>	
Date pro forma completed and sent to PLA:	
Completed by:	
<b>Dredging Campaign Details</b>	
<b>Overview</b>	
Campaign name/reference:	
Estimated start date:	
Estimated completion date:	
<i>If during breeding birds season, statement of justification:</i>	
<b>Required attachment:</b>	Survey to determine the most sensitive lagoons <input type="checkbox"/>
<b>Material</b>	
Source of dredged material:	
<b>Required attachment:</b>	Map to show source of dredged material <input type="checkbox"/>
Estimated quantity of material:	
Physical description of material:	
<b>Required attachment:</b>	Results of most recent particle size analysis <input type="checkbox"/>
Date material last sampled	
<b>Required attachment:</b>	Results of most recent chemical analysis <input type="checkbox"/>
Proposed location within lagoons for disposal	
<b>Other Considerations</b>	
Operations Plan has been referred to	<input type="checkbox"/>
Working Plan of Waste Management Licence has been referred to	<input type="checkbox"/>
<b>TO BE COMPLETED BY PLA</b>	
PLA approval given:	<input type="checkbox"/> YES <input type="checkbox"/> NO
Additional comments	
Circulated to	<input type="checkbox"/> RSPB <input type="checkbox"/> Environment Agency <input type="checkbox"/> Natural England
Date completed:	
Completed by:	
Approved by (if required):	

=O=O=O=