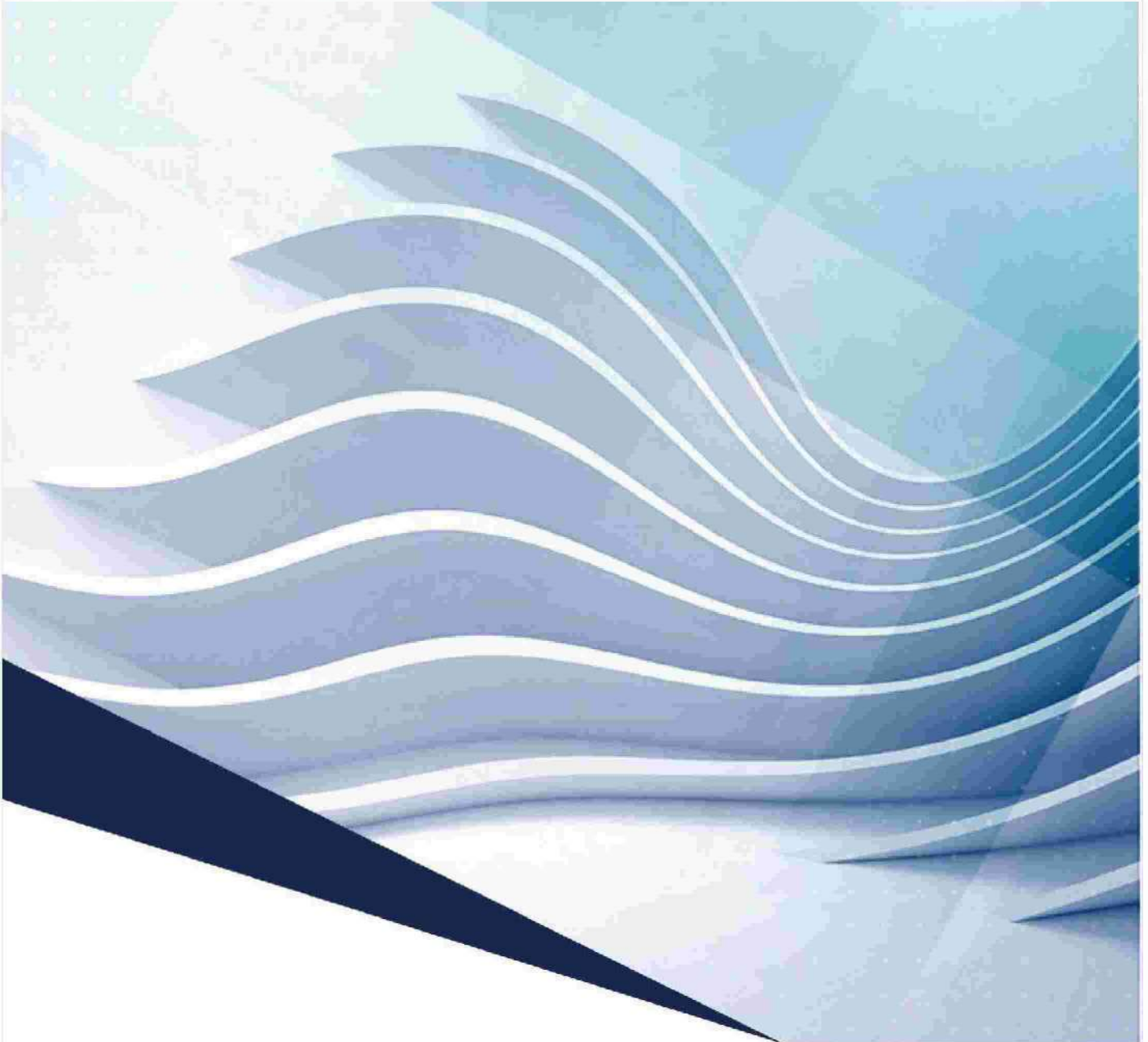


# BYRNE LOOBY



Cork County Council  
Ballycotton Harbour Dredging  
Foreshore Application Report

Report No. CM1123-BLP-ZZ-RP-C-00001

May 2021

Revision 01

**Document Control**

Document: Foreshore Application Report  
Project: Ballycotton Harbour Dredging  
Client: Cork County Council  
Report Number: CM1123-BLP-ZZ-RP-C-00001  
File Origin: \\alpha.local\Data\Sites\Cobh\Public\PROJECTS  
2018\CM1123 Ballycotton Dredging\5 BLP Reports\29  
Foreshore Application\CM1123-BLP-ZZ-RP-C-  
00001\_Foreshore Application Report.docx

**Document Checking:**

Revision	Revision/ Review Date	Details of Issue	Authorised		
			Prepared By	Checked By	Approved By
00	May 2021	Draft Foreshore			
01	24 May 2021	Issued for Foreshore			

Disclaimer: Please note that this report is based on specific information, instructions and information from our Client and should not be relied upon by third parties.

**Contents**

1 Introduction ..... 1

    1.1 Project Background..... 1

    1.2 Proposed Works ..... 2

2 Existing Infrastructure ..... 4

    2.1 Harbour Infrastructure ..... 4

    2.2 Structural Analysis of Pier and Breakwater ..... 6

    2.3 Harbour Usage ..... 6

        2.3.1 Fishing Industry..... 6

        2.3.2 Ferry Operations ..... 7

    2.4 Water Depths/ Dredging ..... 7

    2.5 Existing Fore and Aft Moorings ..... 7

    2.6 Existing Public Pontoon ..... 7

3 Proposed Dredging Works ..... 8

    3.1 Drawings ..... 8

4 Foreshore Areas ..... 9

    4.1 Known Foreshore Applications..... 9

    4.2 Section 3 Foreshore Licence Area ..... 9

5 Hydrodynamic Regime ..... 10

    5.1 Datum ..... 10

    5.2 Tide Levels ..... 10

    5.3 Bed Levels ..... 10

    5.4 Waves ..... 10

6 Seabed Sediment Analysis ..... 11

    6.1 Introduction ..... 11

    6.2 Marine Institute Requirements..... 11

    6.3 Laboratory Results ..... 11

    6.4 Waste Classification ..... 11

    6.5 Marine Institute Guidelines ..... 11

    6.6 Commentary ..... 12

Appendix 1 Outline Construction Method Statement..... 1

Appendix B – Sediment Analysis ..... 2

# 1 Introduction

## 1.1 Project Background

Ballycotton is a coastal village located approximately 25 miles/40 km (by road) East of Cork city. Traditionally a fishing village, access to the sea is via a manmade harbour facing northeast into Ballycotton Bay.

In addition to several commercial fishing vessels the harbour is the base for a Royal National Lifeboat Institution Trent Class All-weather Lifeboat #14-25, the Austin Lidbury, which has been based in Ballycotton since March 1998.

The harbour is also the landing point for seasonal tours of the adjacent Ballycotton Lighthouse and maintenance access for the Commissioner of Irish Lights.

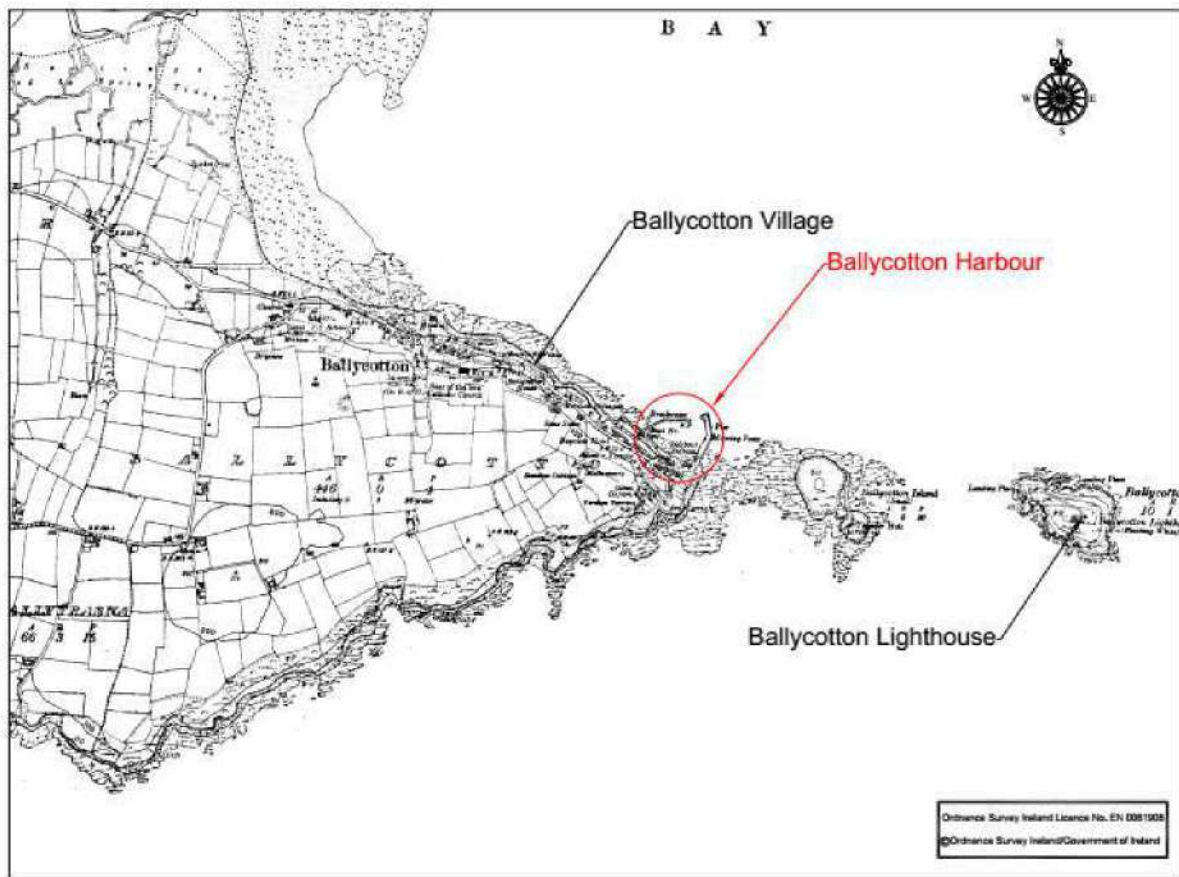


Figure 1 Location Map

## 1.2 Proposed Works

ByrneLooby have been appointed by Cork County Council to provide a single dredging programme as follows:

- Dredge the area outlined in orange on Figure 1 below to bedrock or -3.5m Chart Datum, whichever is shallowest;
- Dredge remainder of the harbour outlined in purple to bedrock or -2.5m Chart Datum whichever is shallowest;
- Disposal of suitable dredged materials at the previously used Dumping at Sea site South of Power Head, 16km southwest of Ballycotton;
- Disposal of contaminated dredged material outlined in cyan to a licenced landfill facility.

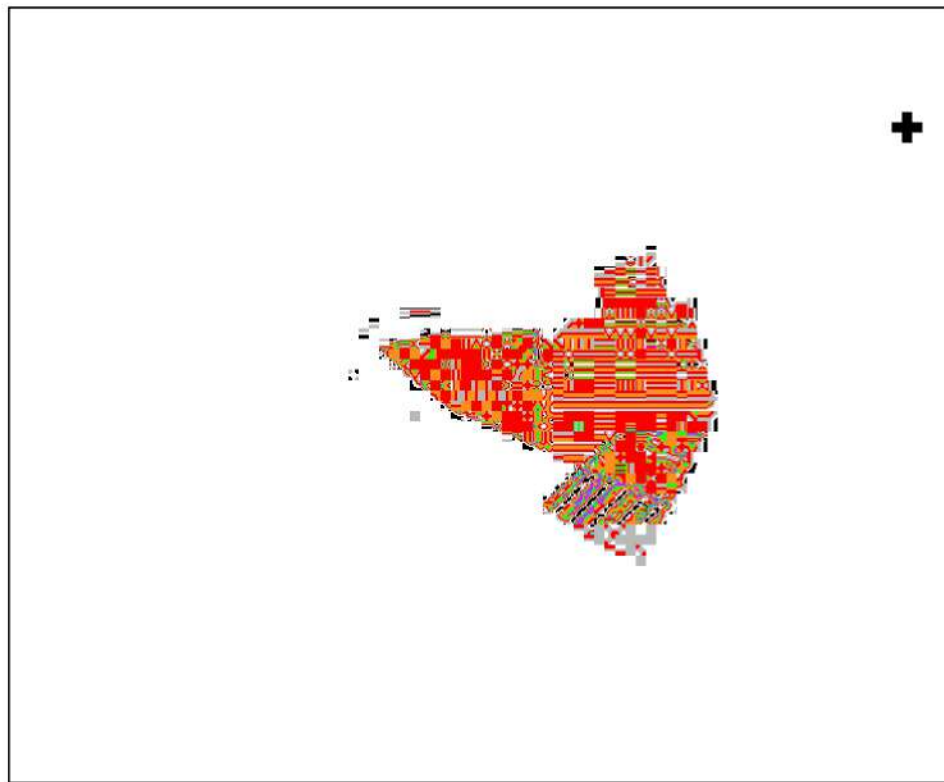


Figure 2 Proposed Dredging Arrangement

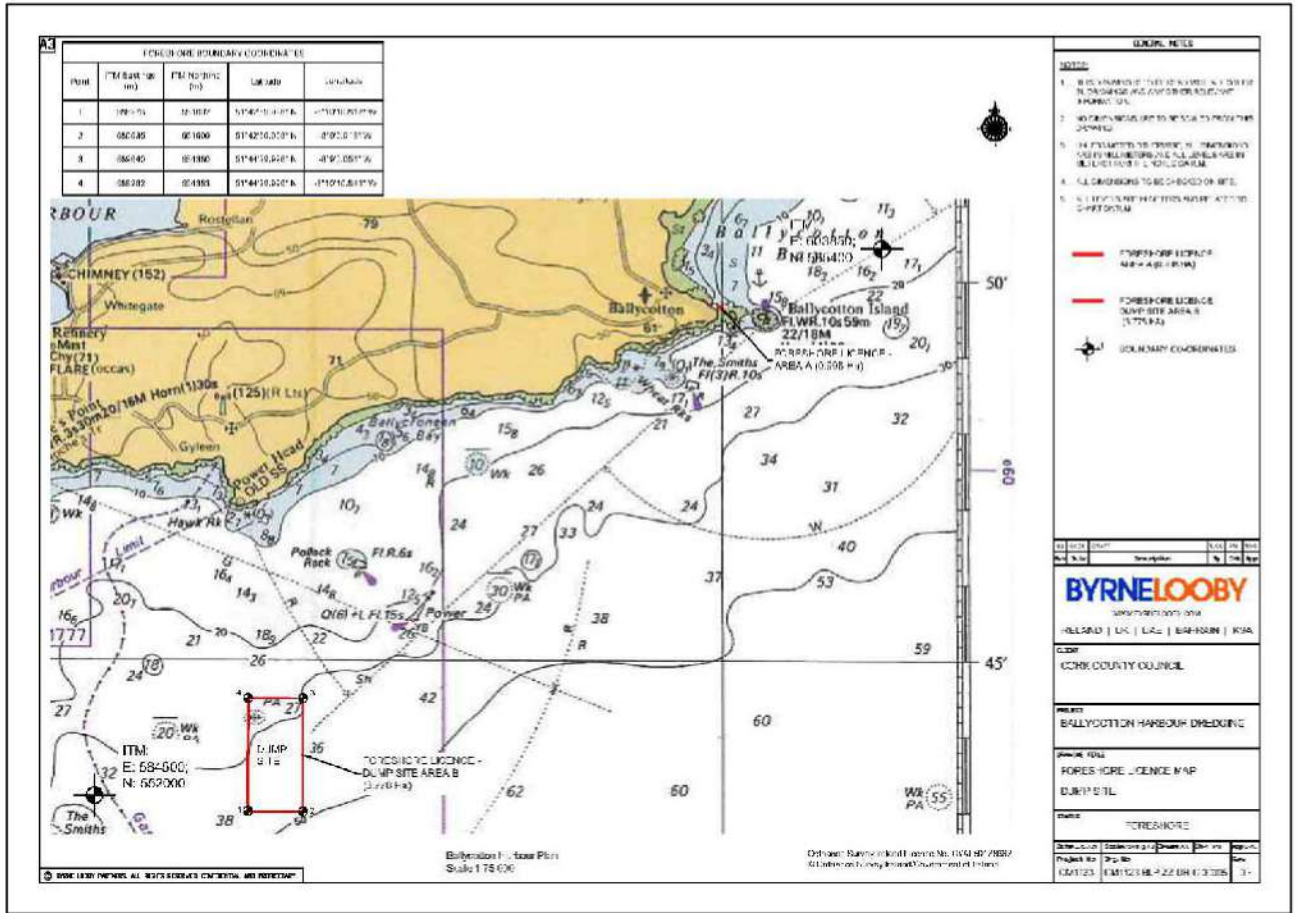


Figure 3 Proposed Dumping at Sea location south of Power Head

Dumpsite Co-Ordinates	
51° 43.00' N	8° 10.18' W
51° 43.00' N	8° 09.00' W
51° 44.50' N	8° 09.00' W
51° 44.50' N	8° 10.18' W

Table 1 Proposed Dump Site Co-Ordinates

## 2 Existing Infrastructure

### 2.1 Harbour Infrastructure

The following elements of infrastructure have been identified in Ballycotton Harbour within the study area;

#### I. Ballycotton Pier

Ballycotton Pier is approximately 150m in length. The inner face (west side) is used as the main berthing wall in Ballycotton. The outer face (east side) provides protection from waves incident on the site from the south and east and is not used for berthing.

The outer face of the pier was originally constructed in stone masonry and mass concrete. The 'head' or north end of the pier is a more modern sheet pile construction. The inner face is the original masonry and mass concrete construction with modern sheet pile repairs. A storm wall on top of the outer face of the pier provides additional protection from waves. The deck of the pier comprises reinforced concrete. Standard pier furniture includes stairs, bollards, mooring bars, toe rails, ladders, lamp standards, water, safety equipment and handrails. Other structures on the pier include public toilets, and ice plant, an elevated footpath/promenade, and a RNLI fuel tank.

The pier is used predominantly for the berthing of larger vessels and the landing of fish. The majority of vessels are fishing vessels; however, the pier is also used by marine leisure users and sea anglers. It is also the main communications access point for Ballycotton Island / Lighthouse.

The seabed level varies from approximately -4.5m Chart Datum at the mouth of the harbour (-7.07m OD Malin) to approximately -1.0m Chart Datum adjacent to the existing pontoon (-3.57m OD Malin). The deck level of the pier is approximately +3.1m OD Malin.

#### II. Breakwater

Ballycotton breakwater is approximately 160m in length. The structure is relatively narrow (max 3m width), and is constructed from mass concrete, with more modern reinforced concrete repairs also evident.

There is very little infrastructure evident on the deck: a small set of steps, ladders, safety equipment, tide gauge, and handrails. The structure is not suitable for berthing and is used predominantly as protection from easterly waves. The structure is used for the storage of fishing equipment and for the access to moorings.





Figure 4 Ballycotton Breakwater

### III. Pontoon & Gangway

A pontoon and gangway were installed at the pier in 2014. The gangway extends from a platform at pier deck level to the floating pontoon deck. The purpose of the pontoon is to provide short term berthing and an access for small launches to existing fore and aft moorings in the harbour. The pontoon is also used by the RNLI to launch a small vessel to access the RNLI mooring.

### IV. RNLI Slipway

The RNLI slipway extends from the RNLI boathouse at the south of the harbour. The slipway is used by the RNLI to launch a small vessel which is used to access the RNLI Mooring.

### V. RNLI Mooring

The RNLI Mooring is used for the mooring of Ballycotton Lifeboat. It is located at the entrance to the harbour.

### VI. Boathouse & Slipway

A dilapidated boat house is located at the very west of the harbour, adjacent to the breakwater. There is an adjoining slipway, walls and reclaimed area in this location. The area is generally only used for the storage of fishing equipment.

## 2.2 Structural Analysis of Pier and Breakwater

Cork County Council and ByrneLooby have undertaken detailed site investigation works within the harbour to determine the structural capacity of the existing pier and breakwater to ensure the proposed dredging will not impact on the stability of structures within the harbour.

Cork County Council appointed commercial divers to investigate the current condition of the sheet pile quay wall and breakwater between mean low water and existing sea bed level in order to determine and major underwater defects within the harbour.

The following conclusions have been determined;

- The existing quay wall has sufficient capacity to dredge to a depth of -3.5m CD;
- Dredging will not take place within 3.5m of the existing breakwater.



Figure 5 RNL Lifeboat Station (foreground) and Ballycotton Pier (background)

## 2.3 Harbour Usage

### 2.3.1 Fishing Industry

Ballycotton Harbour ranks in Ireland's top twenty ports in terms of value and weight of fish landings. In 2019, the value of fish landings in Ballycotton was €3.29m, which was greater than Kinsale (€2.84m) and Baltimore (€2.13m). It is therefore evident that the fishing industry is a major contributor to the local economy of Ballycotton and is an important harbour for sourcing fish produce in Cork and Ireland.

Year	Tonnes	Value
2019	734	€3,297,526
2018	877	€3,040,879
2017	927	€2,051,426
2016	1,373	€4,425,160
2015	1,056	€3,389,153
2014	1,158	€3,218,000
2013	1,120	€2,995,000
2012	1,213	€3,664,000
2011	1,171	€3,437,000
2010	571	€1,342,000

Table 2 – Fisheries Landings in Ballycotton 2010-2019 (Sea Fisheries Protection Authority)

### 2.3.2 Ferry Operations

Ballycotton Lighthouse Tours operates a ferry service to, and tours of Ballycotton Lighthouse and Island. The ferry service commenced in 2014, and annual visitors to the lighthouse are between 2,500 and 3,000, with most visits occurring in the summer season.

## 2.4 Water Depths / Dredging

The harbour basin has suffered from considerable siltation since the last dredge campaigns in 1984 and 1998. Bed levels have now reached a level that will restrict the access of the RNLI Lifeboat in the harbour at very low tides. This has a serious impact on the lifeboat emergency service and prevents vessels with larger draughts entering and existing the harbour.

## 2.5 Existing Fore and Aft Moorings

Approximately 70No. publicly owned moorings are in operation within the harbour.

The existing moorings shall be removed by their owners prior to dredging and reinstated by the owners on completion of the dredging.

## 2.6 Existing Public Pontoon

The pontoon and gangway shall be removed by the dredging Contractor, stored and reinstated on completion on the works.

### 3 Proposed Dredging Works

Dredging will be required to increase water depths at the quay wall and inner harbour. It is proposed to dredge to rock or to -3.5m Chart Datum (whichever is shallowest) along the quay wall and adjacent to the existing RNL mooring.

It is proposed to dredge the inner harbour to rock or to -2.5m Chart Datum Dredging (whichever is shallowest) in the inner harbour. No dredging will take place within 3m of the breakwater.

Suitable excavated material will be disposed of at the existing disposal site, south of Power Head. Material which does not comply with the environmental testing which has been carried out will be disposed of in a suitably licenced facility.

Cork County Council reserves the right to seek a Dumping at Sea Licence from the Environmental Protection Agency to dispose of the dredged material at sea.

#### 3.1 Drawings

The following drawings illustrate the nature and extent of the works;

Drawing No.	Drawing Title
CM1123-BLP-ZZ-DR-C-00001	Overall Site Layout Plan
CM1123-BLP-ZZ-DR-C-00002	Existing Bathymetry
CM1123-BLP-ZZ-DR-C-00003	Proposed Dredging Arrangement
CM1123-BLP-ZZ-DR-C-00004	Foreshore Licence Map Loading Site
CM1123-BLP-ZZ-DR-C-00005	Foreshore Licence Map Dump Site
CM1123-BLP-ZZ-DR-C-00006	Admiralty Chart
CM1123-BLP-ZZ-DR-C-00007	Cross Sections

Table 3 Application Drawings

## 4 Foreshore Areas

### 4.1 Known Foreshore Applications

A number of foreshore applications have been made within Ballycotton Harbour in recent years. The following are the known relevant foreshore licences at the site:

- Foreshore lease application for the installation of a floating pontoon, access gangway, fixed platform, steel guide columns and associated infrastructure (FS005873);
- Foreshore Lease for the Provision of a temporary quay wall and working area to allow for the construction of a below ground pumping station. (FS007022);

### 4.2 Section 3 Foreshore Licence Area

Cork County Council are applying for a Foreshore Licence from the Department of Housing, Planning, Community and Local Government for the dredging of Ballycotton Harbour. A foreshore licence is also being sought for the disposal of suitable dredge material at an existing disposal site, south of Power head, 16km southwest of Ballycotton. It is proposed to dredge to the following depths;

- Dredge the area outlined in orange on Figure 1 below to bedrock or -3.5m Chart Datum, whichever is shallowest;
- Dredge remainder of the harbour outlined in purple to bedrock or -2.5m Chart Datum whichever is shallowest;

## 5 Hydrodynamic Regime

### 5.1 Datum

Ballycotton Harbour Chart Datum is 2.57m above Ordnance Datum (Malin).

### 5.2 Tide Levels

The following tide levels have been determined at Ballycotton Harbour:

Datum	Mean High Water Springs	Mean High Water Neaps	Mean Low Water Neaps	Mean Low Water Springs
Ballycotton Chart Datum	+4.1m	+3.2m	+2.1m	+1.3m
Ballycotton Ordnance Datum Malin	+1.53m	+0.63m	-0.47m	-1.27m

Table 4 Existing Tide Levels

### 5.3 Bed Levels

Bed levels immediately adjacent to the exiting quay wall vary from -4.5m CD at the mouth of the harbour to approximately -1.0m CD at the existing pontoon. Bed levels rise gradually towards the inner harbour, which is a combination of heavy siltation and high bedrock levels within the harbour.

### 5.4 Waves

Short period wind generated waves can develop on the site as a result of strong north easterly winds. The pier orientation and nearby breakwater results in relatively calm conditions at the location of the pier.

The existing pier and breakwater provide good shelter from long period swell waves accessing the site.

## 6 Seabed Sediment Analysis

### 6.1 Introduction

Cork County Council carried out analysis of seabed sediments on 2<sup>nd</sup> October 2020 and 11<sup>th</sup> January 2021 within the proposed dredge boundary. The purpose of the analysis was to determine the presence of contaminants (if any) within the seabed material. Fifteen samples were extracted on the seabed surface.

### 6.2 Marine Institute Requirements

The Marine Institute provides guidelines for the assessment of dredge material for disposal in Irish Waters. The Marine Institute provided a site-specific sampling and analysis plan for this development.

### 6.3 Laboratory Results

The results of the sediment analysis are enclosed in Appendix 2.

### 6.4 Waste Classification

The seabed material which will be subject to dredging was classified in accordance with The Classification, Labelling and Packaging of Dangerous Substances and Mixtures Regulation (EC) No 1272/2008. The results of the classification are enclosed in Appendix 3.

The proposed dredging scheme will be split into hazardous & non-hazardous waste.

Samples which are classified as non-hazardous which shall be disposed of at sea are listed under Waste Code 17 05 06 (Dredging spoil other than those mentioned in 17 05 05).

### 6.5 Marine Institute Guidelines

The Marine Institute (MI) provides guidelines on the assessment of ecological risks associated with dredging and disposal at sea activities. The guidelines propose threshold guidance levels for lower and upper levels of sediment contamination. Contamination values below the lower guidance levels are considered uncontaminated. Contamination values between the lower and upper guidance levels are considered marginally contaminated. Contamination values above the upper guidance level are considered heavily contaminated. An assessment of the results reveals very low levels of contamination of a number of the samples, rendering them marginally contaminated. The contamination levels will not preclude the option of disposing the dredge material at sea, should Cork County Council choose to apply for a Dumping at Sea Licence.

There is an isolated pocket in the inner harbour adjacent to the RNLI slipway which contains elevated levels of contaminants which are above the guidelines allowed to be disposed of at

sea. (Refer to drawing No. CM1123-BLP-ZZ-DR-C-00003 Proposed Dredging Arrangement) for details.

The following contaminants have been found within the Foreshore licence boundary;

- Class II and III levels of TBT & DBT have been found during site investigations adjacent to the RNLI slipway. This material will not be suitable to be disposed of at sea.
- Class II levels of lead have been identified between the pontoon and the head of the pier. Samples returned show elevated levels of Class II lead.

## 6.6 Commentary

Following detailed discussions with the Marine Institute, the proposed dredge campaign will be segregated to facilitate the dredging of material which is suitable to be disposed of at sea, and material which will be disposed of in a suitably licenced site as outlined in the relevant drawings associated with this application.

Cork County Council reserves the right to seek a Dumping at Sea Licence from the Environmental Protection Agency to dispose of suitable dredged material at sea.



## Appendix 1 Outline Construction Method Statement

# BYRNELOOBY



Cork County Council

Ballycotton Harbour Dredging

Outline Construction Method  
Statement

Report No. CM1123-BLP-ZZ-RP-C-00002

April 2021

Revision 02

## Document Control

Document: Outline Construction Method Statement  
Project: Ballycotton Harbour Dredging  
Client: Cork County Council  
Report Number: CM1 123-BLP-ZZ-RP-C-00002  
File Origin: \\alpha.local\Data\Sites\Cobh\Public\PROJECTS  
2018\CM1 123 Ballycotton Dredging\5 BLP Reports\29  
Foreshore Application\CM1 123-BLP-ZZ-RP-C-00002\_Outline  
Construction Method Statement.docx

## Document Checking:

Revision	Revision/ Review Date	Details of Issue	Authorised		
			Prepared By	Checked By	Approved By
00	April 2021	Draft			
01	April 2021	Draft Foreshore			
02	May 2021	Foreshore Application			

Disclaimer: Please note that this report is based on specific information, instructions and information from our Client and should not be relied upon by third parties.

**Contents**

1 Construction Methodology ..... 1

    1.1 Mobilisation ..... 1

    1.2 Site Compound ..... 2

    1.3 Existing Fore and Aft Moorings ..... 2

    1.4 Dredging Works (Overburden Material) ..... 2

        1.4.1 Contaminated Material..... 2

        1.4.2 Uncontaminated Material ..... 2

    1.5 Dredging Works (Rock Material) ..... 2

    1.6 Disposal of Dredge Arisings ..... 3

    1.7 Anticipated Dredge Production Rates ..... 3

    1.8 Programme of Works ..... 3

2 Construction Environmental Management Plan ..... 4

    2.1 Responsible Person ..... 4

    2.2 Working Hours ..... 4

    2.3 Traffic Management Plan ..... 4

    2.4 Management of Waste ..... 5

        2.4.1 Management of Waste..... 5

    2.5 Noise Management..... 6

    2.6 Management of Dust, Odour and Air Quality ..... 7

        2.6.1 Management of Dust..... 7

        2.6.2 Management of Odour..... 8

    2.7 Archaeology ..... 8

    2.8 Water Quality Monitoring ..... 8

    2.9 Health and Safety..... 9

# 1 Construction Methodology

This construction method statement is outline only, and subject to change based on the outcome of foreshore, and other statutory licence applications as well as the preferred contractor methodology.

## 1.1 Mobilisation

A pre-condition survey of the site will be carried out by the contractor to determine the suitability of the plant proposed. It is anticipated that the following will be mobilised to the site for the dredging elements of the works:

- Long Reach back-hoe excavator;
- Dredge barge;
- 1000m<sup>3</sup> hopper barge;
- Tugboat;
- Articulated dump trucks;
- Safety boat.
- Road sweeper;



Figure 1 Typical Dredge Barge, Backhoe Excavator, and Hopper Barge

## 1.2 Site Compound

The contractor will set up the site compound upon mobilising to site. Appropriate fencing will be erected around the perimeter of the site where required. The site compound will be minimised to limit obstructions to the normal operation of the port. The compound will incorporate a site office, canteen, welfare facilities and storage.

## 1.3 Existing Fore and Aft Moorings

The existing moorings shall be removed by their owners prior to dredging and reinstated by the owners on completion of the dredging.

All existing moorings will be stored off site in a location agreed with Cork County Council while dredging works take place.

Existing moorings will be reinstalled on completion of dredging works.

## 1.4 Dredging Works (Overburden Material)

A notice to mariners will be issued prior to the commencement of the dredging works.

The contractor will carry out a bathymetric survey to determine seabed levels.

The dredge barge will be commissioned and certified within the harbour. The tugboat will then tow the barge to the areas requiring dredging.

### 1.4.1 Contaminated Material

The long reach excavator, located on the dredge barge and/or pier deck, will use a dig control system to determine dredge level achieved. The excavated material will be placed in a hopper barge. This material will then be later discharged into covered tipper trucks where appropriate for contaminated material which will be transported to a suitably licenced facility for disposal.

### 1.4.2 Uncontaminated Material

Similarly, the excavated material will be placed in a hopper barge and towed to the disposal site, south of Powers Head for disposal at sea.

Storage of the material will not take place on the quay.

It is likely that dredging activities will take place 24hrs per day, 7days per week to achieve the maximum production rates within tidal envelopes.

## 1.5 Dredging Works (Rock Material)

It is not anticipated that there will be any requirement to dredge rock from the harbour.

## 1.6 Disposal of Dredge Arisings

The following volumes of dredge materials are estimated:

Material to Be Dredged	Volume (m <sup>3</sup> )	Mass (tonnes)
Silts, Sands & Gravels	19,500	15,000

\* Assume bulk density is 1,300kg/m<sup>3</sup>

Table 1 Dredge Volumes

Subject to the quality of material dredged, it is estimated that and 18,000m<sup>3</sup> of gravel, silt and sand will be dredged from the harbour and disposed of at sea.

Approximately 1,500 m<sup>3</sup> of contaminated material will be dredged from the inner harbour and will be disposed at a suitably licenced site.

## 1.7 Anticipated Dredge Production Rates

It is anticipated that both contaminated and non-contaminated overburden material (gravel, silt, and sand) will have a maximum dredging rate of 500m<sup>3</sup> per 24 hours.

It is estimated that the haulage contractor would dispose of the contaminated overburden material to a suitably licenced facility over 12 hours per day.

## 1.8 Programme of Works

The preliminary construction programme is estimated to last 6 months, with the following key elements:

Event:	Time
Mobilisation	2 weeks
Removal of Existing Moorings	1 week
Dredging	8 weeks
Mooring Reinstallation	2 weeks
De-Mobilisation	1 week

## 2 Construction Environmental Management Plan

This section comprises a draft high-level Construction Environmental Management Plan (CEMP) for the works. The final CEMP can only be prepared after foreshore consent, and other consents are provided.

### 2.1 Responsible Person

Cork County Council will appoint a competent and experienced Contractor through public tender. A qualification requirement of the tender will be that the Contractor will be required to be suitably qualified and have the relevant experience in relation to construction environmental management and health and safety. Regular meetings will be held between the Contractor and Cork County Council's representatives in relation to the CEMP.

### 2.2 Working Hours

Dredging works may take place 24hrs per day / 7 days per week, in order to take advantage of the tidal envelope (low tide will not always occur during the daytime).

### 2.3 Traffic Management Plan

A Traffic Management Plan (TMP) will be agreed with Cork County Council, the National Roads Authority and the National Transport Authority as required.

The appointed Contractor will be responsible for:

- The implementation of the TMP;
- Design, planning, installation, maintenance and decommissioning of traffic safety measures as required;
- Detailed traffic management plans compiled in accordance with Chapter 8 of the Traffic Signs Manual, Department of Transport, 2010 including:
  - Phasing of works;
  - Detailed traffic management drawings;
  - Traffic management for marine plant;
  - Timing of operations and works;
  - Road lighting;
- Compliance with the Temporary Closing of Roads Regulations and amendments (Roads Act 1993);



- Public signage;
- Temporary warning and information signs;
- Traffic cones and taping;
- Road danger lamps;
- Temporary construction of roadways;
- Appointment of Traffic Safety and Control Officer, responsible for:
  - Liaison with An Garda Síochána, and Cork County Council Traffic Manager and Local Area Office;
  - Management of traffic;
  - Notification of accidents to An Garda Síochána;
  - Ensure the safe working operation of plant, and machinery;
  - Pre and post works road condition surveys;
  - Weekly reporting to Cork County Council;
- Issuing of notices to the Automobile Association and local newspapers where required;
- Cleaning of internal site roads;
- Making traffic orders, authorisation of signage and signals;

## 2.4 Management of Waste

A Site Waste Management Plan will be agreed with Cork County Council.

Site contractors will be responsible for the collection, control and disposal of all wastes generated by the construction works.

Likely wastes generated include:

- Dredge arisings (refer to Section 2);

### 2.4.1 Management of Waste

Material which is not suitable for disposal at sea shall be disposed of at a suitably licenced site. Cork County Council shall seek a Dumping at Sea Licence from the Environmental Protection Agency to dispose of the remainder of the dredged material at sea.

A general skip will be maintained on site for general waste that is non-recyclable, such as food waste, contaminated plastic and cardboard, polystyrene etc.

Sewage generated during the construction works will be conveyed through the existing system, as the existing on-site facilities will be utilised.

## 2.5 Noise Management

A variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors, and generators. There will be vehicular movements to and from the site that will make use of the existing local road network towards the harbour.

Due to the nature of the activities undertaken on a construction site, there is potential for generation of increased levels of noise. The potential for vibration at neighbouring buildings and residential dwellings is typically limited to HGV movements.

The proposed works is however unlikely to result in significant vibration at local residences from on-site construction activities due to the separation distances.

A Noise Management Plan will be agreed with Cork County Council. The following mitigation measures are proposed:

With regard to construction activities, reference will be made to "*BS5228: Noise Control on Construction and Open Sites*", which offers detailed guidance on the control of noise from demolition and construction activities. In particular, it is proposed that various practices be adopted during construction, including:

- Appointing a site representative responsible for matters relating to noise;
- Monitoring typical levels of noise during critical periods and at sensitive locations.

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These will include:

- Selection of plant with low inherent potential for generation of noise;
- Siting of noisy plant as far away from sensitive properties as permitted by site constraints;
- Any ancillary pneumatic percussive tools will be fitted with mufflers or silencers as recommended by the manufacturers;
- Machines shall be shut down when not being used;
- Handling of plant and materials shall take place in a manner that minimises noise emissions;

- Generators, compressors, and pumps shall be placed behind existing structures, where possible, to act as a screen;
- Vehicle audible warning systems shall be set to the minimum volume as required by the PSCS and Health and Safety Authority.

## 2.6 Management of Dust, Odour and Air Quality

### 2.6.1 Management of Dust

Dust and particulate matter emissions may arise from the delivery of material and other goods to the site and from the storage of material on the site.

Potential causes of dust and particulate matter emissions may include the following:

- Unpaved haul routes – poor quality haul routes will result in the amount of dust generated being exacerbated. All routes are paved on approach to the application site;
- Stockpiles and storage compounds – the stockpiling of material for long periods of time will result in an increase in dust emissions. Stock piling of materials will be managed to limit the generation of dust.

Dust and particulate matter become airborne when either the wind causes the material to be picked up, or mechanical actions as outlined above causes them to be thrown up into the air. The distance that the dust and particulate matter re-settles depends on the size of the particulates, the wind speed, and other atmospheric conditions. Smaller particles can travel a greater distance in general. Long spells of dry weather exacerbate the conditions.

Sensitive receptors such as private dwellings are generally located greater than 50m to the east and south of the existing berth wall. The effect of dust generally reduces at these distances. The prevailing wind direction in Ballycotton is generally west to south west, so it will not transport dust in the direction of these properties, but in the direction of the existing harbour infrastructure.

Dredging in the harbour will, by nature, be under water. No dust will be generated from these works.

#### 2.6.1.1 Mitigation Measures

The following mitigation measures are proposed:

- Site roads shall be regularly swept, cleaned, and maintained as appropriate. Vehicles departing the site shall be subject to wheel washing;
- Public roads outside the site shall be regularly checked for cleanliness and cleaned as necessary;

- Stock piling of material on the pier shall be managed to limit the generation of dust;
- Burning shall not be permitted.

### 2.6.2 Management of Odour

Capital dredging will be required in order to increase water depths. There is a potential for odour to be created due to the disturbance of seabed sediments. These works will be carried out in the coastal environment, where wind speeds are generally greater than inshore as there are no physical obstructions. This will result in the rapid dispersion of odours. The prevailing wind is not likely to transport the odours to sensitive receptors such as Ballycotton village.

A complaint investigation plan will be implemented to record any complaints regarding odour. If the complaint is verified, mitigation measures shall be implemented (such as temporary suspension of the works).

## 2.7 Archaeology

All overburden dredging works shall be archaeologically monitored by an experienced, licensed archaeologist with marine dredging/maritime archaeological experience. Should archaeological material, wreckage, timbers, or other artefacts be recorded during the monitoring, the archaeologist will be empowered to suspend dredging operations in that area to recover and record the material. The recovered items should be placed in temporary wet storage tanks provided on the pontoon barge. In the event that the dredger impacts on a possible shipwreck, then the dredge barge will be moved to a different area while a standby archaeological dive team, in place for such eventualities, is mobilised to undertake an assessment of the impacted material/wreck.

## 2.8 Water Quality Monitoring

Water quality monitoring shall be carried for the duration of the dredging activities. The following data shall be recorded:

- Water Turbidity to NTU (nephelometric turbidity units).
- Water Dissolved Oxygen (mg/l).
- Water Temperature (OC)

The Contractor shall provide Water Quality Recorders for taking the required readings. Readings shall be taken at 10-minute intervals.

The location for the water quality monitoring stations will be agreed with Cork County Council.

## 2.9 Health and Safety

Cork County Council are aware of the duties of the Client in accordance with the provisions of the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (Construction Regulations) 291 of 2013.

A Project Supervisor Design Process and Project Supervisor Construction Stage will be appointed for the design and construction stages of the contract.

## Appendix B – Sediment Analysis



**Rinville**  
**Oranmore**  
**Co Galway**  
**Tel: 091 [REDACTED]**

[REDACTED]  
Byrne Looby  
3 Westbourne Place  
Cobh  
Co. Cork

17 May 2019

Dear [REDACTED]

### **Sampling and Analysis Plan – Ballycotton Harbour**

This Sampling and Analysis Plan for Ballycotton Harbour is designed to cover the dredging and dumping at sea of up to 25 000m<sup>3</sup>.

In total, five surface samples are proposed. You should give your sampling contractor a copy of this plan. They will need to draw the testing laboratory's attention especially to Section 3 and Section 4 and confirm that the selected lab is capable of meeting the quality assurance standards required.

Please select a laboratory well experienced in testing of marine sediment and participating in relevant marine sediment inter laboratory proficiency testing schemes such as QUASIMEME, and please ensure that they can meet the limits of detection required.

If you need clarification on anything, please let me know.

Best regards,

[REDACTED]

---

[REDACTED]  
Marine Environment Chemist

## 1.0 Sample location and analyses required:

Five surface samples, as listed in Table 1 below, should be taken<sup>1</sup>. Sample locations are also shown in Figure 1.

**Table 1.** Locations and details of proposed samples

Sample No.	Depth	Longitude (° W)*	Latitude (° N)*	Parameters for analysis
1	Surface	-8.00079	51.82782	1, 2, 3, 4a, 4b, 4c, 4f
2	Surface	-8.00123	51.82736	1, 2, 3, 4a, 4b, 4c, 4f
3	Surface	-8.00158	51.82736	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g
4	Surface	-8.00298	51.82782	1, 2, 3, 4a, 4b, 4c, 4f
5	Surface	-8.00206	51.82801	1, 2, 3, 4a, 4b, 4c, 4d, 4e, 4f, 4g

\* Positions in decimal degrees, WGS84

## 2.0 Parameter Code:

1. Visual inspection, to include colour, texture, odour, presence of animals etc
2. Water content, density (taking into account sample collection and handling)
3. Granulometry including % gravel (> 2mm fraction), % sand (< 2mm fraction) and % mud (< 63µm fraction).
4. The following determinants in the sand-mud (< 2mm) fraction \* :
  - a) total organic carbon
  - b) carbonate
  - c) mercury, arsenic, cadmium, copper, lead, zinc, chromium, nickel, lithium, aluminium (full digest)
  - d) Organochlorines:
    - HCH and  $\gamma$ -HCH (Lindane),
    - DDT metabolites (pp'DDT, pp'DDE, pp'DDD).
    - ICES 7 PCB congeners - 28, 52, 101, 118, 138, 153, 180)
  - e) total extractable hydrocarbons.
  - f) tributyltin (TBT) and dibutyltin (DBT)
  - g) Polycyclic aromatic hydrocarbons (PAH) - Acenaphthene, Acenaphthylene, Anthracene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (ghi) perylene, Benzo (k) fluoranthene, Chrysene, Dibenz (a,h) anthracene, Flourene, Fluoranthene, Indeno 1,2,3 – cd pyrene, Naphthalene, Phenanthrene, Pyrene.

<sup>1</sup> Further sampling and analysis, at depth if necessary, may be required in the event that problem areas of heavy contamination are identified as a result of the initial testing.



**Note: where the gravel fraction (> 2mm) constitutes a significant part of the total sediment, this should be taken into account in the calculation of the concentrations.**

**3.0 Important notes:**

- 3.1 The required detection limits for the various determinants are given in Table 2. below.
- 3.2 Details of the methodologies used must be furnished with the results. This should include sampling, sub sampling and analytical methods used for each determinant.
- 3.3 Appropriate marine CRM are to be analysed during each batch of analyses and the results to be reported along with sample results.
- 3.4 Blanks & in-house references to be run with each sample batch, and reported with sample results.

**Table 2.** Maximum limits of detection required

Contaminant	Concentration	Units (dry wt)
Mercury	0.05	mg kg <sup>-1</sup>
Arsenic	1.0	mg kg <sup>-1</sup>
Cadmium	0.1	mg kg <sup>-1</sup>
Copper	5.0	mg kg <sup>-1</sup>
Lead	5.0	mg kg <sup>-1</sup>
Zinc	10	mg kg <sup>-1</sup>
Chromium	5.0	mg kg <sup>-1</sup>
Nickel	5	mg kg <sup>-1</sup>
Total extractable hydrocarbons	10.0	mg kg <sup>-1</sup>
TBT and DBT (not organotin)	10	µg kg <sup>-1</sup>
PCB – individual congener	0.1	µg kg <sup>-1</sup>
OCP – individual compound	0.1	µg kg <sup>-1</sup>
DDT metabolite	0.1	µg kg <sup>-1</sup>
PAH – individual compound	10	µg kg <sup>-1</sup>

#### **4.0 Reporting requirements**

Reports should include the following information

- 4.1 Results of testing should be reported in EPA spreadsheet format, which can be found [here](#).
- 4.2 Spreadsheet results to include:
  - Tabulated geophysical/chemical test results
  - Clear expression of units
  - Indication of wet weight or dry weight basis
  - Location of samples in decimal degrees WGS84 (latitude/longitude).
  - Date of sampling
  - Treatment of samples and indication of sub sampling, compositing etc.
  - Summary method details
  - CRM results
  - QA /QC
  - Other quality assurance information (e.g. accreditation status)
  - Project details.
- 4.3 If determinant is not detected, report less than values, and indicate LoD/ LoQ used.
- 4.4 Testing laboratories may be asked to provide additional details of method performance including limit of detection, precision, bias.

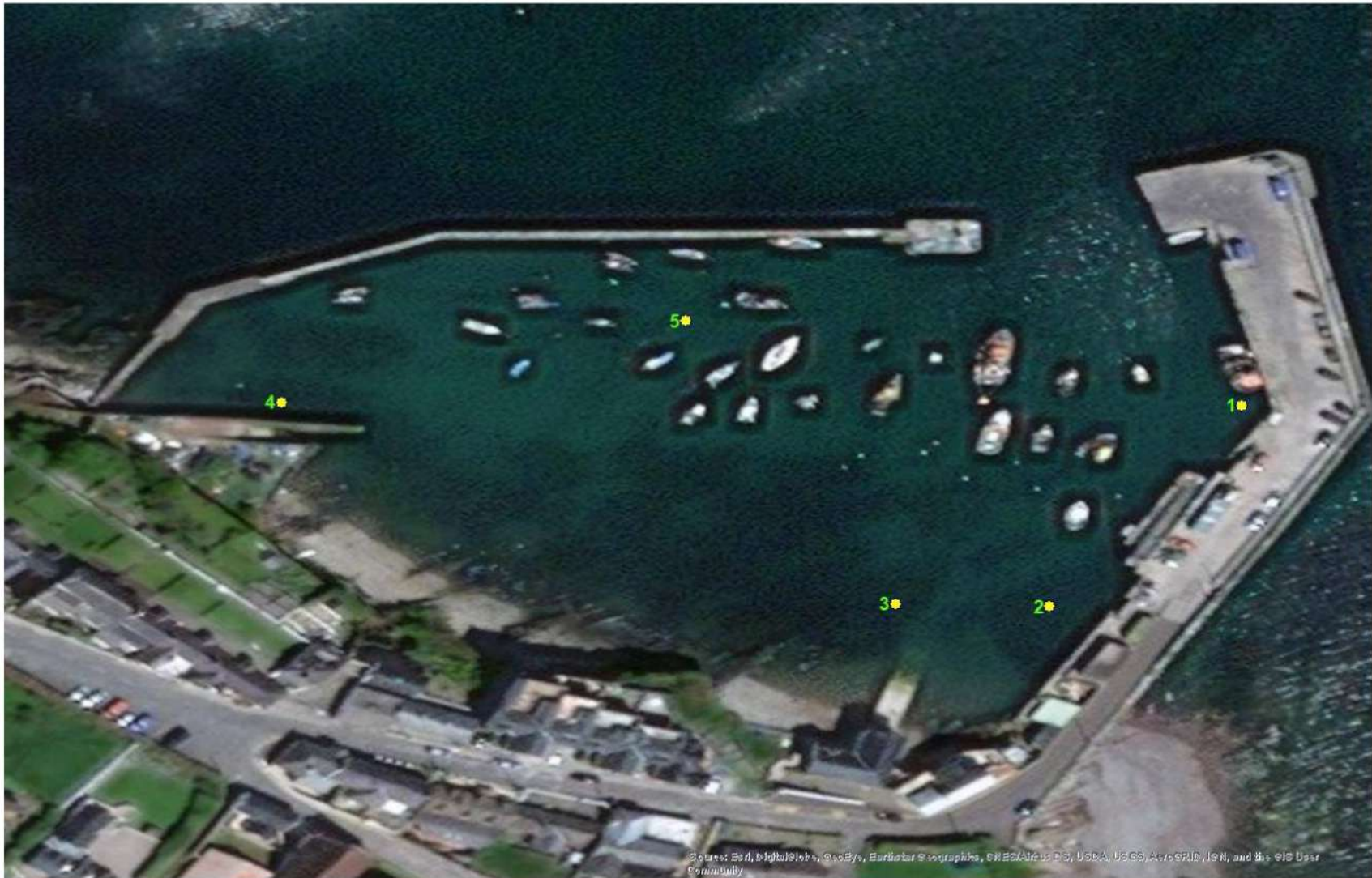


Figure 1. Locations for sediment samples, Ballycotton Harbour.



# Final Report

---

**Report No.:** 20-32243-1  
**Initial Date of Issue:** 02-Dec-2020  
**Client** Priority Geotechnical Ltd  
**Client Address:** Unit 12  
Owenacurra Business Park  
Midleton  
County Cork  
Ireland

**Contact(s):** [REDACTED]

**Project** P20126 Ballycotton

**Quotation No.:** [REDACTED] **Date Received:** 25-Nov-2020

**Order No.:** 13302 **Date Instructed:** 25-Nov-2020

**No. of Samples:** 12

**Turnaround (Wkdays):** 7 **Results Due:** 03-Dec-2020

**Date Approved:** 02-Dec-2020

**Approved By:**

[REDACTED]

**Details:** [REDACTED] [REDACTED] Technical Manager

---

## Results - Soil

**Project: P20126 Ballycotton**

<b>Client: Priority Geotechnical Ltd</b>		<b>Chemtest Job No.:</b>		20-32243	20-32243	20-32243	20-32243	20-32243	20-32243	20-32243	20-32243	20-32243	20-32243
Quotation No.:		<b>Chemtest Sample ID.:</b>		1103276	1103277	1103278	1103279	1103280	1103281	1103282	1103283	1103284	1103284
Sample Location:		BH06	BH03	BH03	BH07	BH07	BH09	BH10	BH10	BH10	BH10	BH10	BH10
Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Top Depth (m):		0.00	1.00	2.00	0.00	1.00	1.00	0.00	1.00	2.00			
Date Sampled:		23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020	23-Nov-2020
<b>Determinand</b>	<b>Accred.</b>	<b>SOP</b>	<b>Units</b>	<b>LOD</b>									
Moisture	N	2030	%	0.020	6.2	35	15	35	16	32	35	38	13
pH	U	2010		4.0									
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010									
Total Sulphur	U	2175	%	0.010									
Sulphate (Acid Soluble)	U	2430	%	0.010									
Organic Matter	U	2625	%	0.40	0.57	2.2	0.71	2.4	0.71	2.9	2.1	2.1	0.72

## Results - Soil

**Project: P20126 Ballycotton**

<b>Client: Priority Geotechnical Ltd</b>	<b>Chemtest Job No.:</b>				20-32243	20-32243	20-32243
Quotation No.:	<b>Chemtest Sample ID.:</b>				1103285	1103286	1103287
	Sample Location:				BH05	BH08	BH08
	Sample Type:				SOIL	SOIL	SOIL
	Top Depth (m):				0.00	1.00	2.00
	Date Sampled:				23-Nov-2020	23-Nov-2020	23-Nov-2020
<b>Determinand</b>	<b>Accred.</b>	<b>SOP</b>	<b>Units</b>	<b>LOD</b>			
Moisture	N	2030	%	0.020	4.5	52	37
pH	U	2010		4.0			8.5
Sulphate (2:1 Water Soluble) as SO <sub>4</sub>	U	2120	g/l	0.010			0.80
Total Sulphur	U	2175	%	0.010			0.36
Sulphate (Acid Soluble)	U	2430	%	0.010			0.14
Organic Matter	U	2625	%	0.40	< 0.40	1.5	2.6

## Test Methods

<b>SOP</b>	<b>Title</b>	<b>Parameters included</b>	<b>Method summary</b>
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.

## **Report Information**

### **Key**

---

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

### **Sample Deviation Codes**

---

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

### **Sample Retention and Disposal**

---

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

[customerservices@chemtest.com](mailto:customerservices@chemtest.com)



# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

**Test Report ID**      **MAR00747**

Issue Version      1

Customer      Priority Geotechnical, Unit 12, Owenacurra Business Park, Midleton, Co. Cork

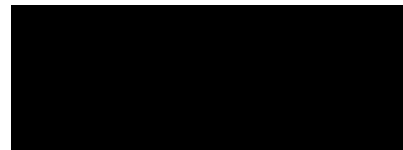
Customer Reference      Sediment Analysis for Disposal at Sea

Date Sampled      05-06/10/2020

Date Received      15-Oct-20

Date Reported      05-Nov-20

Condition of samples      Cold      Satisfactory



Authorised by: 

Position:      Laboratory Manager

Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation.

This report shall not be reproduced, except in full, without the written permission of the laboratory  
Results contained herewith only apply to the samples tested

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00747  
Issue Version            1  
Customer Reference       Sediment Analysis for Disposal at Sea

		Method No	SUB_01*
Client Reference:	SOCOTEC Ref:	Matrix	Visual Description
BH3	MAR00747.001	Sediment	Mud
BH4	MAR00747.002	Sediment	Sandy Gravel
BH5	MAR00747.003	Sediment	Muddy Sandy Gravel
BH6	MAR00747.004	Sediment	Muddy Sandy Gravel
BH8	MAR00747.005	Sediment	Mud

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	%	%	%	%	%
		<b>Method No</b>	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*
		<b>Limit of Detection</b>	0.2	0.2	N/A	N/A	N/A
		<b>Accreditation</b>	UKAS	UKAS	N	N	N
<b>Client Reference:</b>	<b>SOCOTEC Ref:</b>	<b>Matrix</b>	<b>Total Moisture @ 120°C</b>	<b>Total Solids</b>	<b>Gravel (&gt;2mm)</b>	<b>Sand (63-2000 µm)</b>	<b>Silt (&lt;63 µm)</b>
BH3	MAR00747.001	Sediment	51.3	48.7	0.0	7.7	92.3
BH4	MAR00747.002	Sediment	28.5	71.5	44.1	52.9	3.0
BH5	MAR00747.003	Sediment	24.6	75.4	74.1	20.9	4.9
BH6	MAR00747.004	Sediment	31.4	68.6	72.4	18.6	8.9
BH8	MAR00747.005	Sediment	68.0	32.0	0.0	6.8	93.2
Reference Material (% Recovery)			N/A	N/A	N/A	N/A	N/A
QC Blank			N/A	N/A	N/A	N/A	N/A

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	% M/M	% m/m
		<b>Method No</b>	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		<b>Limit of Detection</b>	0.02	0.12
		<b>Accreditation</b>	UKAS	No
Client Reference:	SOCOTEC Ref:	Matrix	TOC	Carbonate %
BH3	MAR00747.001	Sediment	1.92	13.90
BH4	MAR00747.002	Sediment	0.89	4.44
BH5	MAR00747.003	Sediment	1.51	7.68
BH6	MAR00747.004	Sediment	1.28	11.80
BH8	MAR00747.005	Sediment	2.33	15.20
Reference Material (% Recovery)			99	N/A
QC Blank			<0.02	N/A

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	1	0.1	0.5	2	2	0.5	3
		Accreditation	UKAS	No	No	UKAS	UKAS	No	No
Client Reference:	SOCOTEC Ref:	Matrix	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
BH3	MAR00747.001	Sediment	13	0.2	56.3	21.2	214	27.8	111
BH4	MAR00747.002	Sediment	9.7	<0.1	43.7	217	71.8	24.0	144
BH5	MAR00747.003	Sediment	14.4	<0.1	43.4	89.3	45.1	36.4	122
BH6	MAR00747.004	Sediment	13.7	<0.1	45.9	72.4	66.8	30.5	124
BH8	MAR00747.005	Sediment	11.3	<0.1	57.2	32.8	36.4	26.8	119
Certified Reference Material 2702 (% Recovery)			101	101~	100~	106	96	101~	100~
QC Blank			<1	<0.1	<0.5	<2	<2	<0.5	<3

\* See Report Notes  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.

## Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	SOCOTEC Env Chem*	SOCOTEC Env Chem*	SOCOTEC Env Chem*
		Limit of Detection	10	0.5	0.01
		Accreditation	UKAS	No	No
Client Reference:	SOCOTEC Ref:	Matrix	Aluminium	Lithium	Mercury
BH3	MAR00747.001	Sediment	44800	52.9	0.04
BH4	MAR00747.002	Sediment	27500	30.9	0.07
BH5	MAR00747.003	Sediment	30200	40.1	0.07
BH6	MAR00747.004	Sediment	36400	39.1	0.12
BH8	MAR00747.005	Sediment	41200	49.0	0.07
Certified Reference Material 2702 (% Recovery)			105	98	98~
QC Blank			<10	<0.5	<0.01

\* See Report Notes  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	Dibutyltin (DBT)	Tributyltin (TBT)
BH3	MAR00747.001	Sediment	20.9	12.1
BH4	MAR00747.002	Sediment	181	1360
BH5	MAR00747.003	Sediment	35.0	103
BH6	MAR00747.004	Sediment	92.6	195
BH8	MAR00747.005	Sediment	18.5	<5
Certified Reference Material BCR-646 (% Recovery)			88	79
QC Blank			<1	<1

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
BH5	MAR00747.003	Sediment	50.2	23.2	129	384	452	335
BH8	MAR00747.005	Sediment	7.16	10.8	13.2	44.8	53.5	84.8
Certified Reference Material QPH098MS (% Recovery)			97	98	93	83	89	90
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.  
 As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.



# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	BENZGHIP	BKF	CHRYSENE	DBENZA	FLUORANT	FLUORENE
BH5	MAR00747.003	Sediment	251	197	425	56.6	943	51.1
BH8	MAR00747.005	Sediment	64.5	26.4	55.8	13.4	90.9	11.3
Certified Reference Material QPH098MS (% Recovery)			98	100	97	89	91	97
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.  
 As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		<b>Method No</b>	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		<b>Limit of Detection</b>	1	1	1	1	100
		<b>Accreditation</b>	UKAS	UKAS	UKAS	UKAS	N
<b>Client Reference:</b>	<b>SOCOTEC Ref:</b>	<b>Matrix</b>	<b>INDPYR</b>	<b>NAPTH</b>	<b>PHENANT</b>	<b>PYRENE</b>	<b>THC</b>
BH5	MAR00747.003	Sediment	285	42.1	558	807	86200
BH8	MAR00747.005	Sediment	80.6	24.5	60.3	83.0	597000
<b>Certified Reference Material QPH098MS (% Recovery)</b>			<b>81</b>	<b>90</b>	<b>92</b>	<b>93</b>	<b>100~</b>
QC Blank			<1	<1	<1	<1	<100

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.  
 As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	PCB28	PCB52	PCB101	PCB118	PCB138	PCB153	PCB180
BH3	MAR00747.001	Sediment	0.19	0.25	0.13	0.19	0.19	0.19	<0.08
BH4	MAR00747.002	Sediment	<0.08	0.17	0.11	0.17	0.18	0.22	0.10
BH5	MAR00747.003	Sediment	0.09	0.17	0.11	0.10	0.18	0.22	0.23
BH6	MAR00747.004	Sediment	0.22	0.54	0.66	0.85	1.18	0.82	0.30
BH8	MAR00747.005	Sediment	0.11	0.22	0.13	0.22	0.29	0.25	0.10
Certified Reference Material QOR140 MS (% Recovery)			91	111	94	104	124	97	106
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00747  
 Issue Version            1  
 Customer Reference       Sediment Analysis for Disposal at Sea

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	N*	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	AHCH	BHCH	GHCH	DIELDRIN	HCB	DDE	DDT	DDD
BH5	MAR00747.003	Sediment	<0.1	<0.1	0.16	<0.1	<0.1	0.24	<0.1	1.59
BH8	MAR00747.005	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.23	<0.1	0.33
Certified Reference Material QOR140 MS (% Recovery)			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
QC Blank			110~	102~	107~	99~	104	50	45~	60

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.  
 \* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID        MAR00747

Issue Version        1

Customer Reference Sediment Analysis for Disposal at Sea

## REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
SOCOTEC Env Chem*	MAR00747.001-005	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR00747.001-005	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR00747.005	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR00747.003, .005	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling above acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (DDT). These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR00747.003, .005	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene). This should be taken into consideration when utilising the data.

## DEVIATING SAMPLE STATEMENT

Deviation Code	Deviation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Handling Time Exceeded	N/A	N/A
D3	Sample Contaminated through Damaged Packaging	N/A	N/A
D4	Sample Contaminated through Sampling	N/A	N/A
D5	Inappropriate Container/Packaging	N/A	N/A
D6	Damaged in Transit	N/A	N/A
D7	Insufficient Quantity of Sample	N/A	N/A
D8	Inappropriate Headspace	N/A	N/A
D9	Retained at Incorrect Temperature	N/A	N/A
D10	Lack of Date & Time of Sampling	N/A	N/A
D11	Insufficient Sample Details	N/A	N/A
D12	Sample integrity compromised or not suitable for analysis	N/A	N/A

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00747  
 Issue Version            1  
 Customer Reference      Sediment Analysis for Disposal at Sea

Method	Sample and Fraction Size	Method Summary
Total Solids	Wet Sediment	Calculation (100%-Moisture Content). Moisture content determined by drying a portion of the sample at 120°C to constant weight.
Particle Size Analysis	Wet Sediment	Wet and dry sieving followed by laser diffraction analysis.
Total Organic Carbon (TOC)	Air dried and sieved to <2mm	Carbonate removal and sulphurous acid/combustion at 1600°C/NDIR.
Carbonate %	Air dried and sieved to <2mm	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Metals	Air dried and sieved to <2mm	HF/Boric acid extraction followed by ICP analysis.
Organotins	Wet Sediment	Solvent extraction and derivatisation followed by GC-MS analysis.
Polyaromatic Hydrocarbons (PAH)	Wet Sediment	Solvent extraction and clean up followed by GC-MS analysis.
Total Hydrocarbon Content (THC)	Wet Sediment	Solvent extraction and clean up followed by GC-FID analysis.
Polychlorinated Biphenyls (PCBs)	Air dried and sieved to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.
Organochlorine Pesticides (OCPs)	Air dried and sieved to <2mm	Solvent extraction and clean up followed by GC-MS-MS analysis.

Analyte Definitions					
Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name
ACENAPTH	Acenaphthene	C2N	C2-naphthalenes	THC	Total Hydrocarbon Content
ACENAPHY	Acenaphthylene	C3N	C3-naphthalenes	AHCH	alpha-Hexachlorocyclohexane
ANTHRACN	Anthracene	CHRYSENE	Chrysene	BHCH	beta-Hexachlorocyclohexane
BAA	Benzo[a]anthracene	DBENZA	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorocyclohexane
BAP	Benzo[a]pyrene	FLUORANT	Fluoranthene	DIELDRIN	Dieldrin
BBF	Benzo[b]fluoranthene	FLUORENE	Fluorene	HCB	Hexachlorobenzene
BEP	Benzo[e]pyrene	INDPYR	Indeno[1,2,3-cd]pyrene	DDD	p,p'-Dichlorodiphenyldichloroethane
BENZGHIP	Benzo[ghi]perylene	NAPTH	Naphthalene	DDE	p,p'-Dichlorodiphenyldichloroethylene
BKF	Benzo[k]fluoranthene	PERYLENE	Perylene	DDT	p,p'-Dichlorodiphenyltrichloroethane
C1N	C1-naphthalenes	PHENANT	Phenanthrene		
C1PHEN	C1-phenanthrene	PYRENE	Pyrene		

Particle Density by Gas Jar Tests - Summary of Results							
Project No.		Project Name					
P20126		Ballycotton Marina					
Hole No.	Sample				Soil Description at test horizon	Particle Density Mg/m <sup>3</sup>	Remarks
	Ref	Top	Base	Type			
BH03	D	0.00		D		2.47	
BH04	D	0.00		D		2.52	
BH05	D	0.00		D		2.45	
BH06	D	0.00		D		2.42	
BH08	D	0.00		D		2.43	
Notes						Date Printed	Table
Tests performed in accordance with BS 1377 unless annotated otherwise Gas Jar tests to BS1377: Part 2 : 1990, clause 8.2						11/11/2020	sheet

TEST REPORT

DETERMINATION OF DISPERSIBILITY - PINHOLE METHOD - BS1377: Part 5: 1990: CLAUSE 6.2

Project No	N9501-20	Sample Details:	Hole No.	BH03
Project Name	Ballycotton		Depth (m BGL)	0
			No.	1
			Type	D
		ID		

Soil Description : Greyish brown organic silty CLAY with occasional shell fragments.

Natural Moisture Content (%) : 25

Liquid Limit (%) :

Plastic Limit (%) :

The sample was passed over a 2.00mm sieve and no coarse material was removed.

Test Specimen Details

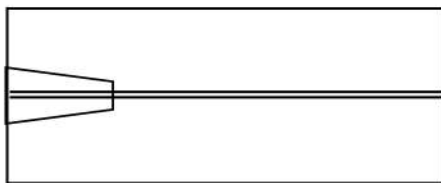
Moisture Content (%) : 26

Bulk Density (Mg/m3) : 1.920



Dry Density (Mg/m3) : 1.520

Head of Water (mm)	Rate of Flow (mL/s)	Duration (s)	Discharge Appearance
50	0.45	11.5	Clear
180	0.74	19	Clear
380	1.13	23	Clear
1020	2.13	22	Clear

The diameter of the pinhole showed no significant measurable change.



The soil would be classified as ND1.

SLR 5.6.2 Iss/Rev 2.0 19-Apr-2018		Approved		Date	11-Dec
© Copyright 2017 SOCOTEC UK Limited. All rights reserved					



TEST REPORT

DETERMINATION OF DISPERSIBILITY - PINHOLE METHOD - BS1377: Part 5: 1990: CLAUSE 6.2

Project No	N9501-20	Sample Details:	Hole No.	BH07
Project Name	Ballycotton		Depth (m BGL)	0
			No.	1
			Type	D
		ID		

Soil Description : Dark greyish brown slightly sandy silty CLAY with occasional shell fragments.

Natural Moisture Content (%) : 36

Liquid Limit (%) :

Plastic Limit (%) :

The sample was passed over a 2.00mm sieve and no coarse material was removed.

Test Specimen Details

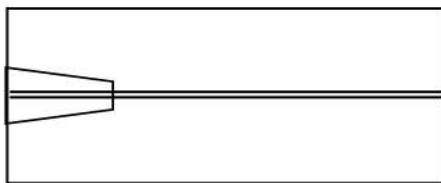
Moisture Content (%) : 31

Bulk Density (Mg/m3) : 1.890



Dry Density (Mg/m3) : 1.450

Head of Water (mm)	Rate of Flow (mL/s)	Duration (s)	Discharge Appearance
50	0.51	20.47	Clear
180	0.93	20.38	Clear
380	1.35	10.35	Clear
1020	2.16	10.4	Clear

The diameter of the pinhole showed no significant measurable change.



The soil would be classified as ND1.

SLR 5.6.2 Iss/Rev 2.0 19-Apr-2018		Approved		Date	11-Dec
© Copyright 2017 SOCOTEC UK Limited. All rights reserved					



**Rinville**  
**Oranmore**  
**Co Galway**  
**Tel: 091 387200**

[REDACTED]  
Byrne Looby  
3 Westbourne Place  
Cobh  
Co. Cork

17 December 2020

Dear [REDACTED]

#### **Follow-up Sampling and Analysis Plan – Ballycotton Harbour**

Following on from your sampling and analysis from earlier this year, I'm suggesting further samples for testing to delineate any areas of contamination.

In total, ten surface samples are proposed for a more limited testing suite of copper, lead, TBT/DBT and PAH (selected samples). You should give your sampling contractor a copy of this plan. They will need to draw the testing laboratory's attention especially to Section 3 and Section 4 and confirm that the selected lab is capable of meeting the quality assurance standards required.

Please select a laboratory well experienced in testing of marine sediment and participating in relevant marine sediment inter laboratory proficiency testing schemes such as QUASIMEME, and please ensure that they can meet the limits of detection required.

Please submit results using the EPA material analysis spreadsheet, which can be found here <https://www.epa.ie/pubs/forms/lic/das/materialanalysisreportingform.html>

If you need clarification on anything, please let me know.

Best regards,

[REDACTED]

---

[REDACTED]

Marine Environment Chemist

## 1.0 Sample location and analyses required:

Ten surface samples, as listed in Table 1 below, should be taken<sup>1</sup>. Sample locations are also shown in Figure 1.

**Table 1.** Locations and details of proposed samples

Sample No.	Longitude (°W)*	Latitude (°N)*	Parameters for analysis
1	-8.00279	51.82789	2, 3, 4a, 4b, 4c (copper and lead only), 4f, 4g
2	-8.00245	51.82793	2, 3, 4a, 4b, 4c (copper and lead only), 4f
3	-8.0024	51.82761	2, 3, 4a, 4b, 4c (copper and lead only), 4f
4	-8.00202	51.82769	2, 3, 4a, 4b, 4c (copper and lead only), 4f, 4g
5	-8.00189	51.82745	2, 3, 4a, 4b, 4c (copper and lead only), 4f
6	-8.00136	51.82732	2, 3, 4a, 4b, 4c (copper and lead only), 4f
7	-8.00123	51.82791	2, 3, 4a, 4b, 4c (copper and lead only), 4f, 4g
8	-8.00115	51.82783	2, 3, 4a, 4b, 4c (copper and lead only), 4f
9	-8.00106	51.82761	2, 3, 4a, 4b, 4c (copper and lead only), 4f, 4g
10	-8.00089	51.82782	2, 3, 4a, 4b, 4c (copper and lead only), 4f, 4g

\* Positions in decimal degrees, WGS84

## 2.0 Parameter Code:

1. Visual inspection, to include colour, texture, odour, presence of animals etc
2. Water content, density (taking into account sample collection and handling)
3. Granulometry including % gravel (> 2mm fraction), % sand (< 2mm fraction) and % mud (< 63µm fraction).
4. The following determinants in the sand-mud (< 2mm) fraction \* :
  - a) total organic carbon
  - b) carbonate
  - c) copper and lead (full digest)
  - d) total extractable hydrocarbons.
  - f) tributyltin (TBT) and dibutyltin (DBT)
  - g) Polycyclic aromatic hydrocarbons (PAH) - Acenaphthene, Acenaphthylene, Anthracene, Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (ghi) perylene, Benzo (k) fluoranthene, Chrysene, Dibenz (a,h) anthracene, Flourene, Fluoranthene, Indeno 1,2,3 – cd pyrene, Naphthalene, Phenanthrene, Pyrene.

<sup>1</sup> Further sampling and analysis, at depth if necessary, may be required in the event that problem areas of heavy contamination are identified as a result of the initial testing.

**Note: where the gravel fraction (> 2mm) constitutes a significant part of the total sediment, this should be taken into account in the calculation of the concentrations.**

**3.0 Important notes:**

- 3.1 The required detection limits for the various determinants are given in Table 2. below.
- 3.2 Details of the methodologies used must be furnished with the results. This should include sampling, sub sampling and analytical methods used for each determinant.
- 3.3 Appropriate marine CRM are to be analysed during each batch of analyses and the results to be reported along with sample results.
- 3.4 Blanks & in-house references to be run with each sample batch, and reported with sample results.

**Table 2.** Maximum limits of detection required

Contaminant	Concentration	Units (dry wt)
Mercury	0.05	mg kg <sup>-1</sup>
Arsenic	1.0	mg kg <sup>-1</sup>
Cadmium	0.1	mg kg <sup>-1</sup>
Copper	5.0	mg kg <sup>-1</sup>
Lead	5.0	mg kg <sup>-1</sup>
Zinc	10	mg kg <sup>-1</sup>
Chromium	5.0	mg kg <sup>-1</sup>
Nickel	5	mg kg <sup>-1</sup>
Total extractable hydrocarbons	10.0	mg kg <sup>-1</sup>
TBT and DBT (not organotin)	10	µg kg <sup>-1</sup>
PCB – individual congener	0.1	µg kg <sup>-1</sup>
OCP – individual compound	0.1	µg kg <sup>-1</sup>
DDT metabolite	0.1	µg kg <sup>-1</sup>
PAH – individual compound	10	µg kg <sup>-1</sup>

#### **4.0 Reporting requirements**

Reports should include the following information

- 4.1 Results of testing should be reported in EPA spreadsheet format, which can be found [here](#).
- 4.2 Spreadsheet results to include:
  - Tabulated geophysical/chemical test results
  - Clear expression of units
  - Indication of wet weight or dry weight basis
  - Location of samples in decimal degrees WGS84 (latitude/longitude).
  - Date of sampling
  - Treatment of samples and indication of sub sampling, compositing etc.
  - Summary method details
  - CRM results
  - QA /QC
  - Other quality assurance information (e.g. accreditation status)
  - Project details.
- 4.3 If determinant is not detected, report less than values, and indicate LoD/ LoQ used.
- 4.4 Testing laboratories may be asked to provide additional details of method performance including limit of detection, precision, bias.



**Figure 1.** Locations for follow-up sediment samples, Ballycotton Harbour.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

**Test Report ID**      **MAR00901**

Issue Version      1

Customer      Priority Geotechnical Ltd, Unit 12, Owenacurra Business Park, Midleton, Co. Cork

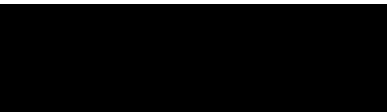
Customer Reference      CM1123 Ballycotton Harbour Site Investigation

Date Sampled      18-Jan-21

Date Received      28-Jan-21

Date Reported      18-Feb-21

Condition of samples      Cold      Satisfactory



Authorised by: 

Position:      Laboratory Manager

Any additional opinions or interpretations found in this report, are outside the scope of UKAS accreditation.

This report shall not be reproduced, except in full, without the written permission of the laboratory  
Results contained herewith only apply to the samples tested



# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00901  
 Issue Version            1  
 Customer Reference       CM1123 Ballycotton Harbour Site Investigation

		Units	%	%	%	%	%
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	No	No	No
Client Reference:	SOCOTEC Ref:	Matrix	Total Moisture @ 120°C	Total Solids	Gravel (>2mm)	Sand (63-2000 µm)	Silt (<63 µm)
S1	MAR00901.001	Sediment	50.4	49.6	0.0	46.0	54.0
S2	MAR00901.002	Sediment	59.6	40.4	0.0	7.9	92.1
S3	MAR00901.003	Sediment	50.1	49.9	81.9	11.7	6.4
S4	MAR00901.004	Sediment	58.8	41.2	0.0	8.0	92.0
S5	MAR00901.005	Sediment	20.5	79.5	72.7	19.0	8.3
S6	MAR00901.006	Sediment	27.2	72.8	53.2	45.2	1.5
S7	MAR00901.007	Sediment	57.5	42.5	0.0	10.7	89.3
S8	MAR00901.008	Sediment	59.4	40.6	1.1	17.1	81.8
S9	MAR00901.009	Sediment	59.4	40.6	0.0	12.0	88.0
S10	MAR00901.010	Sediment	56.8	43.2	0.0	9.2	90.8
Reference Material (% Recovery)			N/A	N/A	N/A	N/A	N/A
QC Blank			N/A	N/A	N/A	N/A	N/A

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00901  
 Issue Version            1  
 Customer Reference       CM1123 Ballycotton Harbour Site Investigation

<b>Units</b>	% M/M	% M/M
<b>Method No</b>	SOCOTEC Env Chem*	SOCOTEC Env Chem*
<b>Limit of Detection</b>	0.02	0.12
<b>Accreditation</b>	UKAS	No

<b>Client Reference:</b>	<b>SOCOTEC Ref:</b>	<b>Matrix</b>	<b>TOC</b>	<b>Carbonate Equivalent (%CO3)</b>
S1	MAR00901.001	Sediment	2.10	10.3
S2	MAR00901.002	Sediment	1.84	15.4
S3	MAR00901.003	Sediment	0.63	17.3
S4	MAR00901.004	Sediment	1.59	15.0
S5	MAR00901.005	Sediment	0.55	12.1
S6	MAR00901.006	Sediment	1.69	6.84
S7	MAR00901.007	Sediment	1.75	16.3
S8	MAR00901.008	Sediment	1.88	16.6
S9	MAR00901.009	Sediment	1.48	16.2
S10	MAR00901.010	Sediment	1.83	15.8
Reference Material (% Recovery)			97	98
QC Blank			<0.02	<0.12

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00901  
 Issue Version            1  
 Customer Reference        CM1123 Ballycotton Harbour Site Investigation

		Units	mg/Kg (Dry Weight)	
		Method No	SOCOTEC Env Chem*	
		Limit of Detection	2	2
		Accreditation	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	Copper	Lead
S1	MAR00901.001	Sediment	61.6	107
S2	MAR00901.002	Sediment	28.0	36.9
S3	MAR00901.003	Sediment	57.7	47.4
S4	MAR00901.004	Sediment	28.4	33.8
S5	MAR00901.005	Sediment	21.1	26.9
S6	MAR00901.006	Sediment	129	50.0
S7	MAR00901.007	Sediment	24.0	28.2
S8	MAR00901.008	Sediment	27.0	32.3
S9	MAR00901.009	Sediment	27.4	40.3
S10	MAR00901.010	Sediment	28.0	32.9
Certified Reference Material 2702 (% Recovery)			99	108
QC Blank			<2	<2

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00901  
 Issue Version            1  
 Customer Reference        CM1123 Ballycotton Harbour Site Investigation

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	Dibutyltin (DBT)	Tributyltin (TBT)
S1	MAR00901.001	Sediment	10.3	18.6
S2	MAR00901.002	Sediment	<5	12.5
S3	MAR00901.003	Sediment	<5	<5
S4	MAR00901.004	Sediment	<5	32.5
S5	MAR00901.005	Sediment	17.4	29.0
S6	MAR00901.006	Sediment	163	1030
S7	MAR00901.007	Sediment	<5	<5
S8	MAR00901.008	Sediment	<5	51.7
S9	MAR00901.009	Sediment	27.5	154
S10	MAR00901.010	Sediment	12.8	64.9
Certified Reference Material BCR-646 (% Recovery)			98	80
QC Blank			<1	<1

\* See Report Notes

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00901  
 Issue Version            1  
 Customer Reference       CM1123 Ballycotton Harbour Site Investigation

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	ACENAPTH	ACENAPHY	ANTHRACN	BAA	BAP	BBF
S1	MAR00901.001	Sediment	250	25.7	178	767	879	854
S4	MAR00901.004	Sediment	2.86	6.57	14.7	66.0	79.8	81.6
S7	MAR00901.007	Sediment	3.34	4.87	12.3	42.3	55.9	66.8
S9	MAR00901.009	Sediment	5.60	7.50	19.4	83.2	110	92.0
S10	MAR00901.010	Sediment	3.47	3.22	6.00	20.8	29.1	46.6
Certified Reference Material QPH098MS (% Recovery)			92	94	104	68	69	68
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.  
 As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00901  
 Issue Version            1  
 Customer Reference       CM1123 Ballycotton Harbour Site Investigation

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	BENZGHIP	BKF	CHRYSENE	DBENZAH	FLUORANT	FLUORENE
S1	MAR00901.001	Sediment	536	515	873	122	1320	169
S4	MAR00901.004	Sediment	74.2	59.1	78.8	15.0	130	9.14
S7	MAR00901.007	Sediment	52.3	31.8	49.0	10.4	73.6	8.00
S9	MAR00901.009	Sediment	90.6	58.9	104	19.1	225	10.8
S10	MAR00901.010	Sediment	39.6	20.9	28.8	7.99	44.3	7.15
Certified Reference Material QPH098MS (% Recovery)			82	70	85	86	77	89
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.  
 As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID            MAR00901  
 Issue Version            1  
 Customer Reference        CM1123 Ballycotton Harbour Site Investigation

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS
Client Reference:	SOCOTEC Ref:	Matrix	INDPYR	NAPTH	PHENANT	PYRENE
S1	MAR00901.001	Sediment	627	79.6	773	1130
S4	MAR00901.004	Sediment	78.6	15.6	51.2	130
S7	MAR00901.007	Sediment	59.0	18.7	37.0	71.2
S9	MAR00901.009	Sediment	98.8	17.1	106	205
S10	MAR00901.010	Sediment	48.1	11.9	24.2	42.6
Certified Reference Material QPH098MS (% Recovery)			67	89	90	82
QC Blank			<1	<1	<1	<1

For full analyte name see method summaries  
 ~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are available.  
 As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID        MAR00901

Issue Version        1

Customer Reference    CM1123 Ballycotton Harbour Site Investigation

## REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
SOCOTEC Env Chem*	MAR00901.001-010	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR00901.001-010	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR00901.002-004, .007-008	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/303/304	MAR00901.001-010	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene). This should be taken into consideration when utilising the data.

## DEVIATING SAMPLE STATEMENT

Deviation Code	Deviation Definition	Sample ID	Deviation Details. The following information should be taken into consideration when using the data contained within this report
D1	Holding Time Exceeded	N/A	N/A
D2	Handling Time Exceeded	N/A	N/A
D3	Sample Contaminated through Damaged Packaging	N/A	N/A
D4	Sample Contaminated through Sampling	N/A	N/A
D5	Inappropriate Container/Packaging	N/A	N/A
D6	Damaged in Transit	N/A	N/A
D7	Insufficient Quantity of Sample	N/A	N/A
D8	Inappropriate Headspace	N/A	N/A
D9	Retained at Incorrect Temperature	N/A	N/A
D10	Lack of Date & Time of Sampling	N/A	N/A
D11	Insufficient Sample Details	N/A	N/A
D12	Sample integrity compromised or not suitable for analysis	N/A	N/A



# Certificate of Analysis



Issuing Laboratory SOCOTEC, Marine Department, Specialist Chemistry, Etwall House, Bretby Business Park, Ashby Road, Bretby, Burton-upon-Trent DE15 0YZ

Test Report ID           MAR00901  
 Issue Version            1  
 Customer Reference      CM1123 Ballycotton Harbour Site Investigation

Method	Sample and Fraction Size	Method Summary
Total Solids	Wet Sediment	Calculation (100%-Moisture Content). Moisture content determined by drying a portion of the sample at 120°C to constant weight.
Particle Size Analysis	Wet Sediment	Wet and dry sieving followed by laser diffraction analysis.
Total Organic Carbon (TOC)	Air dried and sieved to <2mm	Carbonate removal and sulphurous acid/combustion at 1600°C/NDIR.
Carbonate %	Air dried and sieved to <2mm	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Metals	Air dried and sieved to <2mm	HF/Boric extraction followed by ICP analysis.
Organotins	Wet Sediment	Solvent extraction and derivatisation followed by GC-MS analysis.
Polyaromatic Hydrocarbons (PAH)	Wet Sediment	Solvent extraction and clean up followed by GC-MS analysis.

Analyte Definitions					
Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name	Analyte Abbreviation	Full Analyte name
ACENAPTH	Acenaphthene	C2N	C2-naphthalenes	THC	Total Hydrocarbon Content
ACENAPHY	Acenaphthylene	C3N	C3-naphthalenes	AHCH	alpha-Hexachlorocyclohexane
ANTHRACN	Anthracene	CHRYSENE	Chrysene	BHCH	beta-Hexachlorocyclohexane
BAA	Benzo[a]anthracene	DBENZA	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorocyclohexane
BAP	Benzo[a]pyrene	FLUORANT	Fluoranthene	DIELDRIN	Dieldrin
BBF	Benzo[b]fluoranthene	FLUORENE	Fluorene	HC	Hexachlorobenzene
BEP	Benzo[e]pyrene	INDPYR	Indeno[1,2,3-cd]pyrene	DDD	p,p'-Dichlorodiphenyldichloroethane
BENZGHIP	Benzo[ghi]perylene	NAPTH	Naphthalene	DDE	p,p'-Dichlorodiphenyldichloroethylene
BKF	Benzo[k]fluoranthene	PERYLENE	Perylene	DDT	p,p'-Dichlorodiphenyltrichloroethane
C1N	C1-naphthalenes	PHENANT	Phenanthrene		
C1PHEN	C1-phenanthrene	PYRENE	Pyrene		

## Particle Density by Gas Jar Tests - Summary of Results

Project No. P20126		Project Name Ballycotton Harbour Site Investigation					
Hole No.	Sample				Soil Description at test horizon	Particle Density Mg/m <sup>3</sup>	Remarks
	Ref	Top	Base	Type			
S1		0.00		B		2.63	
S10		0.00		B		2.53	
S2		0.00		B		2.60	
S3		0.00		B		2.62	
S4		0.00		B		2.57	
S5		0.00		B		2.66	
S6		0.00		B		2.61	
S7		0.00		B		2.61	
S8		0.00		B		2.61	
S9		0.00		B		2.63	
Notes Tests performed in accordance with BS 1377 unless annotated otherwise Gas Jar tests to BS1377: Part 2 : 1990, clause 8.2					Date Printed 18/02/2021	Table sheet	