Hatston Pier
Dredging Best Practicable Environmental Option Report

August 2023

CONTROL SHEET

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Project Title: Hatston Pier
Report Title: Dredging Best Practicable Environmental Option Report
Document number: 13145
Project number: 674795

Issue Record

Issue	Status	Author	Reviewer	Approver	Issue Date
1	Final	CCAS	GD	GD	28/2/2023
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2	Rev 2	CCAS	GD	GD	18/8/2023

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VAT no. GB 348 6770 57.

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1 INTRODUCTION

EnviroCentre Ltd. has been appointed by Orkney Islands Council Harbour Authority (OICHA) to undertake a Best Practicable Environmental Options appraisal (BPEO) in support of the application for a dredge licence for capital dredging to help develop the new berths and approaches for Hatston Pier. The overall proposal for Hatston comprises a 300m extension to the existing pier and the creation of 7.5 hectares of quayside laydown area through reclamation; there will be a ship lift, additional link span and fuel facility incorporated in the development.

As part of the licensing process applicants are required to undertake a Best Practicable Environmental Option (BPEO) assessment for the disposal routes for the prospective dredge material in conjunction with the assessment of the chemical and physical properties of the same material to ensure that quality of the material is suitable for the identified disposal route(s).

1.1 Background Information

There is a requirement to undertake an element of dredging adjacent to the pier extension to bring the bed level to -10m below Chart Datum (bCD). The deepest likely dredge depth is just less than 1m below existing bed level and it is likely that backhoe dredging technique from land would be used to remove dredge spoil onto land for reuse within the development.

Based on calculations from a recent bathymetric survey, it is estimated that the total dredge requirement is for the removal of 650 m^3 in front of the quay extension and c. 4,200m^3 from around the access to the boat lift. These areas are detailed on Drawing202043/C- 40 in Appendix A.

Sediment sampling was undertaken in December 2022 which comprised collection of 6 grab samples from the dredge area. The samples predominately consisted of sand with variable silt and gravel content.

The proposed dredge area and volume is detailed in Table 1-1 below with the dredge area presented Drawing 202043C-21A in Appendix A.

Table 1-1: Proposed Dredge Areas and Approximate Dredge Volumes

Dredge Area	Approximate Total Dredge Volume (m^3)	Target Dredge Depth (m below Chart Datum)	Dredge Thickness (m)
Quayside – Dredge Section 1	650	-10 m	<1.0 m
Boat lift -Dredge Section 2	4,200	-6m	<1.0 m

1.2 Scope of Report

The purpose of this report is to review each of the available potential disposal options for the dredged materials. The options which are not considered to be practicable are rejected and the reasons for doing so are explained.

Those options which are practicable are examined in detail and assessed against the following considerations: -

- Environmental;
- Strategic; and
- Cost.

The report then compares the practicable disposal options and draws a conclusion on the BPEO.

1.3 Sediment Sampling and Nature of Marine Sediments on Site

Samples from the proposed dredge area adjacent to the new pier extension were collected in December 2022 and submitted for analysis in line with Marine Scotland's guidance and the agreed sampling plan. Samples for the boat lift area were collected in April 2023. The sample logs are provided in Appendix B with Laboratory certificates in Appendix C. All chemical results are provided on a dry weight basis.

Note: Due to a change in dredge requirements following further design adjustments, it has been concluded that there is no dredging requirements needed in the approaches which were previously included in the submitted sampling plan. The samples relating to this area which is no longer proposed to be dredged are WP – M77, WP – M78 and WP-M79. The results for these are still included in the lab certificates, but not considered for assessment below.

Samples WP – M70, WP – M71 and WP-M72 relate to the dredge pocket adjacent to the pier extensions and samples G-01,G-02 and G-03 are representative of the dredge area in the boat lift dredge pocket The results are summarised below.

Sediment type was predominately sand with varying gravel and silt content.

The following sections details the screening of the sample results against the Revised Action Levels (RALs) with further consideration of any exceedances detailed in Section 3 – Further Assessment.

1.3.1 Metals

Exceedances of the Revised Action Levels adopted by Marine Scotland (RALs) for metals can be summarised as follows:

All samples recorded metals below their respective RAL1.

1.3.2 Tributyl Tin (TBT)

All 6 samples recorded TBT below the LOD

1.3.3 Polyaromatic Hydrocarbons (PAHs)

All 6 samples recorded PAH species below either the LOD or RAL1 with the exception of 1 sampleG-03 which recorded 3 PAH species above RAL1.

1.3.4 Polychlorinated Biphenyls (PCBs)

All 6 samples recorded individual and total ICES 7 PCB congeners below both the LOD and RAL1.

1.3.5 Total Hydrocarbons (THC)

All 6 samples recorded THC below RAL1.

1.4 Summary

In summary, all contaminants of concern were recorded below either the limit of detection or respective RAL1 with the exception of G-03 which recorded 3 PAH species above RAL1. No exceedances of RAL 2 were recorded.

1.5 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

If this report is to be submitted for regulatory approval more than 12 months following the report date, it is recommended that it is referred to EnviroCentre Limited for review to ensure that any relevant changes in data, best practice, guidance or legislation in the intervening period are integrated into an updated version of the report.

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2 DISCUSSION OF AVAILABLE DISPOSAL OPTIONS

The BPEO process is geared towards identifying a preferred overall strategy from the perspective of the environment as a whole, as opposed to detailed optimisation of any one selected scheme.

In this instance, it has been decided that the BPEO for the material, from both the pier extension dredge area and boat lift dredge area ,is the beneficial re-use of the material through its incorporation within the proposed development on land.

The chemical quality of the material is typically acceptable for sea based disposal and has very low levels of contamination in the terrestrial land context and is considered suitable for its intended use.

3 FURTHER ASSESSMENT

3.1 Water Framework Directive Assessment

As outlined in the Water Framework Directive Assessment: estuarine and coastal waters, there are several key receptors which can be impacted upon which need considered.

- Hydromorphology
- Biology – habitats
- Biology – fish
- Water quality
- Protected areas

A WFD assessment has not been undertaken as the proposed works have an accompanying Environmental Impact Assessment Report detailing all of this information.

The dredge site is not located within 2km of any designated bathing waters.

The dredge site is not designated as shellfish water or within 2km of a designated shellfish water.

3.2 Potential Risk to Water Quality and Marine Life

The potential risks to water quality at the dredge site are further considered as all other receptors have been screened out of the assessment.

Contaminant levels within the proposed dredge material are considered to be very low and not considered to represent a significant risk to the overall water quality at the dredge site. The key risks to water quality are from the dredging exercise where there may be periods of higher suspended solids which are likely to be both localised and temporary in nature. The larger grained material like gravel and sands will drop to the sea floor quickly, and any changes in suspended solids/turbidity will be driven by the finer grained material content, silts and clay sized particles. Where finer grained materials are cohesive, they will sink to the sea floor rapidly

Table 3-1: Summary of PSA Data

Dredge Area	Gravel (>2mm)	Sand (0.063mm<Sand<2mm)	Silt & Clay (<0.063mm)	Quantity to be dredged m^3
Hatston Pier	3.4%	69.1%	27.5%	650 m^3
	22.1 m^3	449.2 m^3	178.7 m^3	
Boat Lift	17.2%	57.4%	25.4%	4,200 m^3
	722.4 m^3	2410.8 m^3	1066.8 m^3	

The dominant sediment type across both dredge areas is sand. Considering the dredge volume as a whole using averaged particle size analysis data, the dominant sediment type is sand comprising 57.4 to 69.1% of the total and the remainder made up of 25.4-27.5% silt and 3.4 -17.2% comprising gravel sized fractions.

Given that an average of 72.5 to 74.6% of the sediment across all dredge areas comprises sand and gravel, it is considered that the majority of the dredged sediment will fall out of suspension quickly at the dredge site with limited lateral spread.

The remaining portion of the dredge 27.5 to 27.5% of dredge material comprises silt/clay sized particles. This material is considered to have a longer suspension time than sand and gravel sized particles when in suspension. Any effects from the dredging of the material is considered to be both localised and temporary.

In summary, the associated risk with degradation of water quality directly associated with the proposed dredging is considered to be Low i.e. unlikely to cause a change in status of the waterbodies in question at the dredge site.

3.3 Conclusions and Recommendations

Review of available chemical quality information has highlighted no exceedances of RAL1 at the Hatston Pier Extension dredge site and 1 sample (out of 3 analysed) recording elevated PAHs at the boat Lift Dredge site.. Assessment of risks to the water environment and marine life concluded that there is a low risk of the dredging of the sediments impacting upon the overall ecological or chemical status.

Based on the chemical quality of the sediment samples retrieved and tested from the dredge site, the dredging of sediments and re-use of the sediments within the terrestrial development is considered to present a low level of risk to the water environment, and any effects, primarily associated with the dredging will be both localised and temporary.

REFERENCES

Marine Scotland (2017). Pre-Dredge Sampling Guidance Version 2: Scottish Government.
Marine Scotland (2015). Guidance for Marine Licence Applicants Version 2: Scottish Government.

APPENDICES

A FIGURES

Dredging - Section 1:
Dredge Depth: -10.0m CD
Dredge Area: 1,307 m2
Dredge Volume: 650 m3

Dredge Section 1: Borehole (BH) and Wash Probe (WP) Location Coordinates

	OSGB36		ETRS89 (Degress, Decimal Minutes)	
Point	Easting	Northing	Lat	Long
BH-M51	343 945.5	1013 098.1	59° 00.0772' N	2° 58.6371' W
BH-M52	343 906.9	1013 136.7	59° 00.0976' N	2° 58.6874' W
BH-M53	343 835.5	1013 179.0	59° 00.1198' N	2° 58.7626' W
BH-M54	343 773.6	1013 224.4	59° 00.1438' N	2° 58.8280' W
WP-M70	343 926.2	1013 115.6	59° 00.0864' N	2° 58.6669' W
WP-M71	343 868.4	1013 166.9	59° 00.1135' N	2° 58.7281' W
WP-M72	343 805.8	1013 202.9	59° 00.1324' N	2° 58.7940' W

Dredge Section 2: Grab Sample (G) Location Coordinates

	OSGB36		ETRS89 (Degress, Decimal Minutes)	
Point	Easting	Northing	Lat	Long
G-01	343735	1013150	59° 00.1034' N	2° 58.8671' W
G-02	343785	1013125	59° 00.0903' N	2° 58.8145' W
G-03	343825	1013095	59° 00.0745' N	2° 58.7723' W

Dredging - Section 2:
Dredge Depth: -6.0m CD
Dredge Area: 3,338 m2
Dredge Volume: 4200 m3

BH-M54 1B WP-M72 1C BH-M53 WP-M71 1D BH-M52 1E WP-M70 BH-M51 1A
2D 2C 2E 2F G-02 G-03 G-01 2H 2B 2G 2A
Rocks Rock Shingle Shingle Shingle Mean Low Water Springs Bay of Kirkwall
North Breakwater (Remains of) Hatston Pier Water Storage Facility Ex. ESS Ex. Tanks

ORKNEY ISLANDS COUNCIL
ORKNEY LOGISTICS BASE, HATSTON
DREDGING MARINE LICENCE APPLICATION

Scale 1: 1000

0 25 50 75 100 150 200m

SCALE 1:1000 at A1

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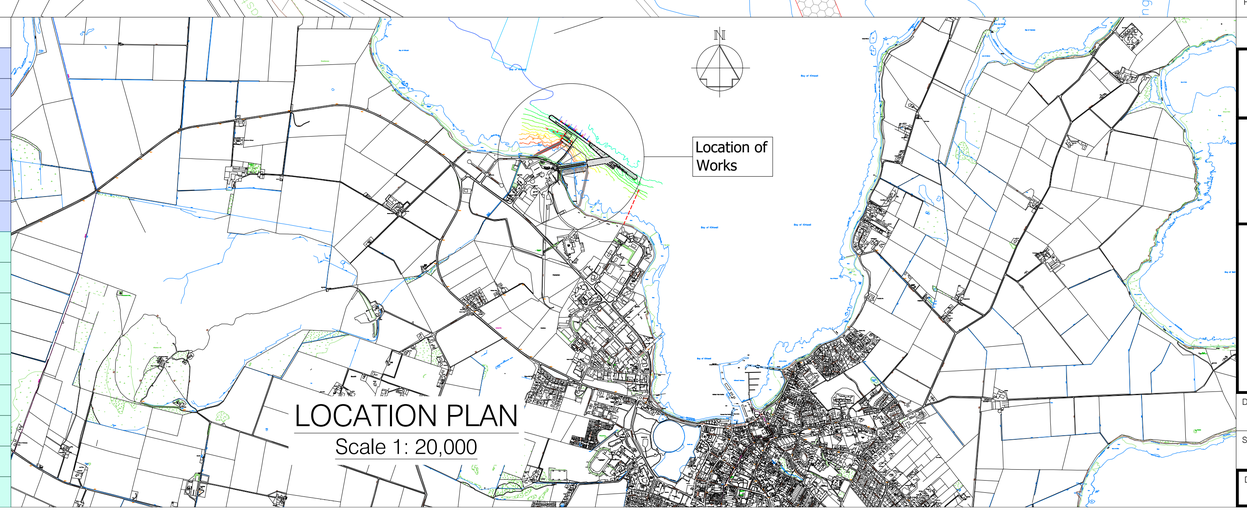
Dredging Marine Licence Application Point Co-ordinates

	Point Number	Northing:	Easting:	Latitude:	Longitude:
Section 1: -10.0m CD	'1A'	1013 088.5 N	343 963.2 E	59° 00.0721' N	2° 58.6279' W
	'1B'	1013 216.5 N	343 783.6 E	59° 00.1396' N	2° 58.8174' W
	'1C'	1013 191.8 N	343 833.9 E	59° 00.1267' N	2° 58.7645' W
	'1D'	1013 159.0 N	343 878.0 E	59° 00.1094' N	2° 58.7179' W
	'1E'	1013 124.6 N	343 921.0 E	59° 00.0912' N	2° 58.6725' W
Section 2: -6.0m CD	'2A'	1013 103.1 N	343 785.9 E	59° 00.0785' N	2° 58.8133' W
	'2B'	1013 168.5 N	343 694.1 E	59° 00.1130' N	2° 58.9101' W
	'2C'	1013 149.6 N	343 759.4 E	59° 00.1034' N	2° 58.8416' W
	'2D'	1013 135.1 N	343 809.9 E	59° 00.0959' N	2° 58.7887' W
	'2E'	1013 123.2 N	343 800.3 E	59° 00.0895' N	2° 58.7985' W
	'2F'	1013 086.8 N	343 851.3 E	59° 00.0703' N	2° 58.7447' W
	'2G'	1013 074.6 N	343 842.6 E	59° 00.0636' N	2° 58.7536' W
	'2H'	1013 111.0 N	343 791.6 E	59° 00.0828' N	2° 58.8074' W



LOCATION PLAN
Scale 1: 20,000

REV	DATE	REVISION	DRN	CHK
P1	10:08:2023	Preliminary Issue P1 for comment	JJM	

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ORKNEY ISLANDS COUNCIL Harbour Authority

Orkney Logistics Base, Hatston, Orkney

Consenting Process
Dredging Marine Licence Application

Arch Henderson 1919
Civil Engineers
Structural Engineers
Architects
CDM Co-ordinators
Geotechnical services
Environmental services
Stewart Building, Lerwick, Shetland. ZE1 0LL.
Tel : 01595 695512
www.arch-henderson.co.uk - email : lerwick@arch-henderson.co.uk
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DRAWN :	DATE :	CHECKED :	APPROVED :
JJM	August 2023	SSJ	APS

SCALE : (A1)	DRAWING STATUS :
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DRAWING No : 202043/C- 40 REV : P1

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Chart Datum (Kirkwall)	Ordnance Datum (Newlyn)	Quay Heights and Tide Data Hatston Pier, Kirkwall
+6.40m	+5.00m	Quay Edge Level
+3.00m	+1.60m	Mean High Water Spring Tides
+1.40m	0.00m	Ordnance Datum (Newlyn)
+0.60m	-0.80m	Mean Low Water Spring Tides
0.00m	-1.40m	Chart Datum (Kirkwall)
-5.00m	-6.40m	
-7.50m	-8.90m	
-10.00m	-11.40m	

2001 Site Investigation
Carried out by Fugro Ltd (Project No. 14513)
May 2001
Boreholes: F.BH1 to F.BH8

~2011 Site Investigation
Carried out by Orkney Islands Council
Engineering Probes: TP 1b to TP7

2021 Site Investigation
Carried out by Causeway Geotech (Project No. 21-1031)
December 2021
Boreholes: BH-M51 to BH-M61
Wash Probes: WP-M70 to WP-M79

WP-M79 WP-M77 WP-M78 BH-M55 BH-M54 WP-M72 BH-M53 WP-M71 BH-M52 WP-M70 BH-M51 WP-M74 BH-M56 WP-M73 BH-M57 BH-M58 BH-M59 WP-M75 WP-M76 BH-M60 BH-M61 TP 1b TP 3 TP 2c TP 4 TP 5b TP 6b TP 7 F. BH1 F. BH2 F. BH3 F. BH4 F. BH5 F. BH6 F. BH7 F. BH8

-11m CD -10m CD -9m CD -8m CD -7m CD -6m CD -5m CD -4m CD -3m CD -2m CD -1m CD

Outfall Pipe

ORKNEY ISLANDS COUNCIL
ORKNEY LOGISTICS BASE, HATSTON
SITE INVETSIGATION LAYOUT PLAN
Scale 1: 1250

0 25 50 75 100 150 200m
SCALE 1:1250 at A1

Rocks Rock Shingle Earth house (site of) Coastal Slope Spreads Springs Ex. ESS Ex. Tanks Hatston Pier Water Storage Facility CG access (restricted) MHWS Mean Low Water Springs Bay of Kirkwall Boulders GALT VIEW WB Wind Turbine El Sub Sta Track 6 5

REV	DATE	REVISION	DRN	CHK
P1	20:02:2023	Preliminary Issue P1 for comment	JJM	

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Orkney Logistics Base, Hatston, Orkney

Consenting Process
Site Investigation Location Plan

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Civil Engineers
Structural Engineers
Architects
CDM Co-ordinators
Geotechnical services
Environmental services
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JJM	February 2023	SSJ	APS

SCALE : (A1)	DRAWING STATUS :
As Shown	Consents

DRAWING No : 202043/C- 05 REV : -

B SAMPLE LOGS

Sample ID	Sample Location (Lat/Long)	Sample description
M70	59, 0.085997, W, 2, 58.667938, 51.5742	Coarse SAND with shells Biota present. No odour
M71	59, 0.113181, W, 2, 58.728355, 51.5766	Fine-coarse brown/grey SAND on surface, with occasional intact shells. Coarse shelly SAND Biota present. No odour
M72	59, 0.131875, W, 2, 58.79513, 51.579	Fine -coarse light brown/grey SAND with some larger shell fragments. Coarse shelly SAND Biota present No odour.
M77	59, 0.229095, W, 2, 58.965888, 51.5858	Fine light brown SAND on surface, seaweed on surface. Coarse shelly SAND. Biota present. No odour
M78	59, 0.232136, W, 2, 58.906062, 51.5838	Light grey fine SAND on surface with some shell fragments. Coarse grey/brown SAND Biota present. No odour
M79	59, 0.254728, W, 2, 58.997236, 51.5871	Grey/brown fine SILT/SAND on surface. Coarse SAND with small SHELL fragments below surface Biota present No odour
G-01	59° 00.1034' N 2° 58.8671' W	Coarse sand and shell fragements with fine black silt at surface. Biota Present -worms No Odour
G-02	59° 00.0903' N 2° 58.8145' W	Coarse sand and shell fragements with fine black silt at surface. Biota Present -worms No Odour
G-03	59° 00.0745' N 2° 58.7723' W	Soft Silty Sand with minor shell fragments

Grab Sample M70

Grab Sample M71

Grab Sample M72

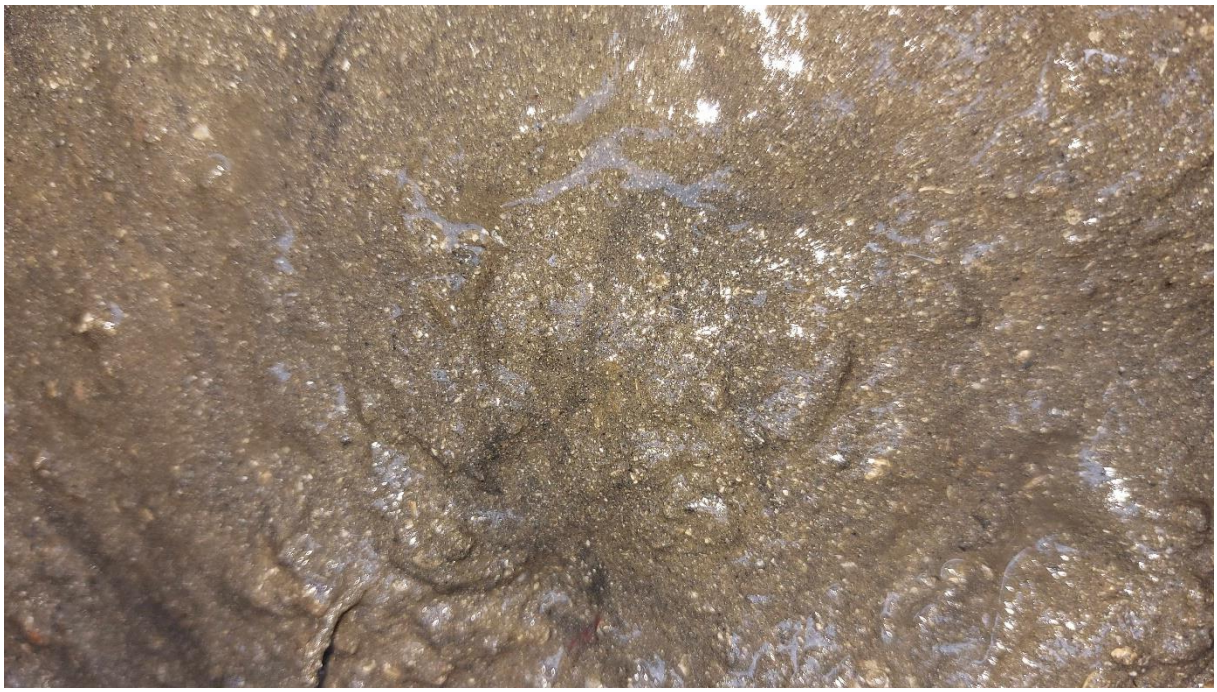
Grab Sample M77

Grab Sample M78

Grab Sample M79

Grab SampleG-01

Grab SampleG-02



Grab SampleG-03

C LAB CERTIFICATES

Certificate of Analysis

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

Test Report ID	**MAR01257**
Issue Version	1
Customer	Causeway Geotech
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis
Date Sampled	10-17-Dec-21
Date Received	04-Jan-22
Date Reported	31-Jan-22
Condition of samples	Ambient Unsatisfactory

Samples arrived outside of holding time for Organotins, PAHs and THC.

Authorised by: Marya Hubbard

Position: Laboratory Manager

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

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis

		Units	%	%	%	%	%	Mg/m3	N/A
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SOCOTEC Doncaster*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	N	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Particle Density**	**Asbestos**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	37.6	62.4	0.2	69.6	30.2	2.73	NAIIS
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	30.0	70.0	21.3	23.9	54.8	2.77	NAIIS
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	29.4	70.6	0.7	70.6	28.7	2.71	NAIIS
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	20.2	79.8	15.3	60.0	24.6	2.76	NAIIS
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	20.6	79.4	27.5	59.2	13.3	2.76	NAIIS
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	20.4	79.6	17.6	58.6	23.7	2.76	NAIIS
		Reference Material (% Recovery)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		QC Blank	N/A	N/A	N/A	N/A	N/A	N/A	N/A

* See Report Notes

NAIIS - No Asbestos Identified In Sample

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopmer

		Units	% M/M
		Method No	SOCOTEC Env Chem*
		Limit of Detection	0.02
		Accreditation	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**TOC**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	0.59
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	0.65
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	0.54
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	0.40
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	0.43
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	0.59
		Reference Material (% Recovery)	106
		QC Blank	<0.02

* See Report Notes

NAIIS - No Asbestos Identified In Sample

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis

		Units	mg/Kg (Dry Weight)							
		Method No	SOCOTEC Env Chem*							
		Limit of Detection	0.5	0.04	0.5	0.5	0.01	0.5	0.5	2
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Mercury**	**Nickel**	**Lead**	**Zinc**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	2.9	0.23	18.0	11.8	0.05	12.3	13.6	39.4
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	2.8	0.16	18.7	9.8	0.10	12.4	10.2	38.1
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	1.9	0.16	16.6	9.6	0.11	11.2	6.8	31.2
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	7.5	0.16	29.7	14.4	0.04	22.8	6.5	41.2
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	2.2	0.06	20.2	8.1	0.12	13.1	3.5	27.5
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	12.0	0.17	29.9	12.7	0.04	21.2	7.0	33.0
Certified Reference Material SETOC 774 (% Recovery)			105	106	104	105	108	103	108	103
QC Blank			<0.5	<0.04	<0.5	<0.5	<0.01	<0.5	<0.5	<2

* See Report Notes

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Certificate of Analysis

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

Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis

		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)**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	<5	<5
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	<5	<5
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	<5	<5
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	<5	<5
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	<5	<5
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	<5	<5
Certified Reference Material BCR-646 (% Recovery)			67	59
QC Blank			<1	<1

* See Report Notes

Samples arrived outside of holding time - D1 applies to all results

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis

		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**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	1.04	<1	<1	2.90	4.03	7.07
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	<1	<1	<1	3.17	4.84	10.5
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	<1	<1	1	6.85	8.90	10.9
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	<1	<1	<1	<1	1.16	2.23
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	<1	<1	<1	<1	<1	<1
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	<1	<1	<1	<1	<1	1.01
Certified Reference Material Quasimeme QPH097MS (% Recovery)			79	110	86	78	77	70
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 avaliable.

As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.

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Samples arrived outside of holding time - D1 applies to all results

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopmer

		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**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	8.18	4.92	3.74	1.67	5.82	<1
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	9.82	5.54	3.89	1.30	6.42	<1
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	10.3	7.03	8.00	1.35	11.0	<1
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	2.75	1.49	1.13	<1	1.34	<1
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	<1	<1	<1	<1	<1	<1
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	1.35	<1	1.11	<1	<1	<1
Certified Reference Material Quasimeme QPH097MS (% Recovery)			76	89	82	68	73	83
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

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Samples arrived outside of holding time - D1 applies to all results

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopmer

		Units	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/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	N*	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	10.2	3.27	4.01	6.00	20400
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	11.0	1.87	2.46	6.44	18400
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	12.0	2.29	3.49	11.4	22100
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	2.93	<1	<1	1.77	13800
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	<1	<1	<1	<1	4540
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	<1	<1	<1	1.11	25200
Certified Reference Material Quasimeme QPH097MS (% Recovery)			74	90	73	75	106~
QC Blank			<1	<1	<1	<1	<100

For full analyte name see method summaries

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* See Report Notes

Samples arrived outside of holding time - D1 applies to all results

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis

		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**
WP-M77 (ES1) 0.00-0.15m	MAR01257.001	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
WP-M78 (ES1) 0.00-0.15m	MAR01257.002	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
WP-M79 (ES1) 0.00-0.15m	MAR01257.003	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
WP-M70 (ES1) 0.00-0.15m	MAR01257.004	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
WP-M71 (ES1) 0.00-0.15m	MAR01257.005	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
WP-M72 (ES1) 0.00-0.15m	MAR01257.006	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Certified Reference Material Quasimeme QOR146MS (% Recovery)			99	111	86	102	102	92	98
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

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Test Report ID MAR01257
Issue Version 1
Customer Reference 21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis

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*	MAR01257.001-006	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SOCOTEC Doncaster*	MAR01257.001-006	Analysis was conducted by an internal SOCOTEC laboratory.
SUB_01*	MAR01257.001-006	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR01257.001-006	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR01257.001-006	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	MAR01257.001-006	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.
ASC/SOP/303/304	MAR01257.001-006	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 outside 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 (PHENANT) . These circumstances 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	MAR01257.001-006	Samples arrived outside of holding time for Organotins, PAH & THC due to to courier freight issues around Christmas.
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

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Test Report ID	MAR01257
Issue Version	1
Customer Reference	21-1031 Scapa DWQ and Hatston Pier Redevelopment - Marine Scotland Analysis

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 ground	Carbonate removal and sulphurous acid/combustion at 1600°C/NDIR.
Metals	Air dried and seived to <63µm	Aqua-regia 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 seived 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-Hexachlorcyclohexane
ANTHRACN	Anthracene	CHRYSENE	Chrysene	BHCH	beta-Hexachlorcyclohexane
BAA	Benzo[a]anthracene	DBENZAH	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorcyclohexane
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		

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

Test Report ID MAR01852

Issue Version: 1

Customer: EnviroCentre Ltd, 8 Eagle Street, Glasgow, G4 9XA

Customer Reference: Hatston Boat Lift 677439

Date Sampled: 19-Apr-23

Date Samples Received: 26-Apr-23

Test Report Date: 19-May-23

Condition of samples: Ambient Satisfactory

Opinions and Interpretations expressed herein are outside the scope of our UKAS accreditaion
The results reported relate only to the sample tested
The results apply to the sample as received

JMColbourne

Authorised by: Jane Colbourne

Position: Customer Service Specialist

UKAS TESTING
1252

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Certificate of Analysis

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

Test Report ID	MAR01852
Issue Version	1
Customer Reference	Hatston Boat Lift 677439

		Units	%	%	%	%	%	N/A
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Asbestos**
G-01	MAR01852.001	Sediment	48.0	52.0	31.85	41.97	26.18	NAIIS
G-02	MAR01852.002	Sediment	35.9	64.1	14.23	63.91	21.87	NAIIS
G-03	MAR01852.003	Sediment	39.8	60.2	5.60	66.39	28.00	NAIIS
		Reference Material (% Recovery)	N/A	N/A	N/A	N/A	N/A	N/A
		QC Blank	N/A	N/A	N/A	N/A	N/A	N/A

* See Report Notes

NAIIS - No Asbestos Identified In Sample

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Test Report ID	MAR01852
Issue Version	1
Customer Reference	Hatston Boat Lift 677439

		Units	% M/M
		Method No	WSLM59*
		Limit of Detection	0.02
		Accreditation	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**TOC**
G-01	MAR01852.001	Sediment	0.37
G-02	MAR01852.002	Sediment	0.55
G-03	MAR01852.003	Sediment	0.51
		Reference Material (% Recovery)	100
		QC Blank	<0.02

* See Report Notes

NAIIS - No Asbestos Identified In Sample

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Test Report ID MAR01852
Issue Version 1
Customer Reference Hatston Boat Lift 677439

		Units	mg/Kg (Dry Weight)							
		Method No	ICPMSS*							
		Limit of Detection	0.5	0.04	0.5	0.5	0.01	0.5	0.5	2
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic**	**Cadmium**	**Chromium**	**Copper**	**Mercury**	**Nickel**	**Lead**	**Zinc**
G-01	MAR01852.001	Sediment	4.7	<0.04	29.8	10.0	0.02	20.5	9.1	42.5
G-02	MAR01852.002	Sediment	5.9	0.05	24.2	13.4	0.03	16.3	10.8	48.6
G-03	MAR01852.003	Sediment	3.9	<0.04	19.3	9.0	0.01	12.9	8.1	31.1
Certified Reference Material SETOC 768 (% Recovery)			107	98	109	111	95	106	99	108
QC Blank			<0.5	<0.04	<0.5	<0.5	<0.01	<0.5	<0.5	<2

* See Report Notes

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Test Report ID	MAR01852
Issue Version	1
Customer Reference	Hatston Boat Lift 677439

		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)**
G-01	MAR01852.001	Sediment	<5	<5
G-02	MAR01852.002	Sediment	<5	<5
G-03	MAR01852.003	Sediment	<5	<5
Certified Reference Material BCR-646 (% Recovery)			49	57
QC Blank			<1	<1

* See Report Notes

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Test Report ID MAR01852
Issue Version 1
Customer Reference Hatston Boat Lift 677439

		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**
G-01	MAR01852.001	Sediment	4.85	<1	6.64	31.3	43.8	41.8
G-02	MAR01852.002	Sediment	2.16	<1	4.94	18.3	21.1	16.8
G-03	MAR01852.003	Sediment	13.4	1.42	17.5	74.5	90.5	74.2
Certified Reference Material Nist 1941b (% Recovery)			95	118	73	74	68	87
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 avaliable.
As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
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Test Report ID MAR01852
Issue Version 1
Customer Reference Hatston Boat Lift 677439

		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**
G-01	MAR01852.001	Sediment	33.6	40.0	35.6	5.94	46.2	3.67
G-02	MAR01852.002	Sediment	15.4	17.9	19.6	3.09	30.2	2.01
G-03	MAR01852.003	Sediment	64.8	69.7	81.6	11.9	127	8.76
Certified Reference Material Nist 1941b (% Recovery)			88	93	99	127	89	59
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 avaliable.
As the method uses surrogate standards to correct for losses, the RM results are reported as percentage trueness, not recovery.
*See report notes

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Certificate of Analysis

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

Test Report ID MAR01852
Issue Version 1
Customer Reference Hatston Boat Lift 677439

		Units	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/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
G-01	MAR01852.001	Sediment	32.5	3.28	22.5	48.8	33900
G-02	MAR01852.002	Sediment	14.7	2.69	12.3	32.8	26300
G-03	MAR01852.003	Sediment	65.0	5.19	64.5	131	35100
Certified Reference Material Nist 1941b (% Recovery)			88	63	86	79	87~
QC Blank			<1	<1	<1	<1	<100

For full analyte name see method summaries
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		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**
G-01	MAR01852.001	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
G-02	MAR01852.002	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
G-03	MAR01852.003	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Certified Reference Material Nist 1941b (% Recovery)			66	84	89	95	95	85	100
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries
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REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR01852.001-003	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMSS*	MAR01852.001-003	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR01852.001-003	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR01852.001-003	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR01852.001-003	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	MAR01852.001-003	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01852.001-003	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	Sample Contaminated through Damaged Packaging	N/A	N/A
D3	Sample Contaminated through Sampling	N/A	N/A
D4	Inappropriate Container/Packaging	N/A	N/A
D5	Damaged in Transit	N/A	N/A
D6	Insufficient Quantity of Sample	N/A	N/A
D7	Inappropriate Headspace	N/A	N/A
D8	Retained at Incorrect Temperature	N/A	N/A
D9	Lack of Date & Time of Sampling	N/A	N/A
D10	Insufficient Sample Details	N/A	N/A
D11	Sample integrity compromised or not suitable for analysis	N/A	N/A

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Issue Version	1
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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 ground	Carbonate removal and sulphurous acid/combustion at 1600°C/NDIR.
Metals	Air dried and seived to <63µm	Aqua-regia 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 seived 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-Hexachlorcyclohexane
ANTHRACN	Anthracene	CHRYSENE	Chrysene	BHCH	beta-Hexachlorcyclohexane
BAA	Benzo[a]anthracene	DBENZAH	Dibenzo[ah]anthracene	GHCH	gamma-Hexachlorcyclohexane
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		

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