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Report of Survey

Dun Laoghaire Harbour

Sediment Samples & Analysis

March 2015

Client:

Dun Laoghaire Harbour Company

Consulting Engineers:

Waterman Moylan Ltd.

Prepared by:

Hydrographic Surveys Ltd.

The Cobbles

Crosshaven

County Cork

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REPORT CONTROL SHEET

Client	Dun Laoghaire Harbour Company					
Client Representative	Jim Caffrey					
Project Name	DUN LAOGHAIRE SEDIMENT SAMPLING AND ANALYSIS					
Report Name	DUN LAOGHAIRE SEDIMENT SAMPLING AND ANALYSIS					
Project Number	PH 15009					
This Report Comprises of	TOC	Text	No. of Volume	No. of Appendices	Drawings	Electronic data
	1	5	1	3	1	*.pdf, *.dwg, *.ags

Revision	Status	Author(s)	Approved By	Issue Date
D01	Draft	JC	JBJ	24.03.2015

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APPENDICES

DRAWING

1 INTRODUCTION

1.1 SITE LOCATION & DESCRIPTION

Hydrographic Surveys Ltd. were instructed by Waterman Moylan on behalf of Dun Laoghaire Harbour Company to undertake and have analysed sediment sampling at Dun Laoghaire Harbour. 13 representative sediment samples were acquired for analysis at NLS.

Sediment Sampling was undertaken on 26th January 2015.

2 METHODOLOGY

2.1 HORIZONTAL CONTROL

Positioning was provided using a Trimble Ag 132 DGPS receiver interfaced with Hypack 2014 survey software. Co-ordinates were recorded for each sample.

The recorded positions of the samples are shown on drawing number HS 24/15.

Sample numbers & positions (Irish National Grid coordinates)

Sediment Sample	Easting	Northing
M1	324604	229047
M2	324544	229076
M3	324606	229238
M4	324724	229364
M5	324766	229566
M6	324762	230027
M7	324961	230058
M8	325137	230093
M9	324875	230243
M10	325435	230051
M11	325619	230061
M12	325795	230054
M13	325985	230053

2.2 SEDIMENT SAMPLING

Samples were taken using a stainless steel Van Veen grab sampler. Once recovered the samples were sealed in specialised sample pots and labelled.

The 13 samples were sealed and dispatched by courier to the National Laboratory Service in the U.K. for analysis in February 2015. The laboratory began analysis on the samples on February 3rd 2015. The analysis results were released on March 19th 2015.

3 RESULTS

The NLS sample analysis report (Report ID 20074544_1) for the thirteen samples is included in Appendix 1. We append the additional requirement of a Certified Reference Material (CRM) within the NLS report.

The samples were analysed for the following parameters to meet the usual analysis requirements for marine samples set by the Environment Protection Agency/Marine Institute:

Granulometry, Organic Carbon, Zinc, Nickel, Copper, Lead, Arsenic, Cadium, Lithium, Aluminium, Chrominium, Mercury, Dibutylin, Tributylin, Polychlorinated Biphenyls and Polyaromatic Hydrocarbons.

Sample analysis results were formatted into the Marine Institute Dredge Sample Spreadsheet format and a copy of this file *"Dun Laoghaire Sampling_DAS material analysis reporting form_Final"* is provided with this report.

APPENDIX 1

National Laboratory Service

Report ID 20074544-1

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Barry Jenkins
Hydrographic Surveys Ltd
The Cobbles
Crosshaven
Co Cork

Dear Barry

Please find attached the results for the batch of 14 samples described below.

Samples Registered on:	02-Feb-2015
Analysis Started on:	03-Feb-2015
Analysis Completed on:	19-Mar-2015
Results for Batch Number	20074544
Your Purchase Order Number:	None Supplied

You will be invoiced shortly by our accounts department.

If we can be of further assistance then please do not hesitate to contact us.

Yours sincerely

Vici Morgan
Customer Services Team Leader
Tel: (0113) 231 2178
nls@environment-agency.gov.uk

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: CRM Certified Reference Material

Folder No: 003078668

Sampled on: Date Not Supplied

Comments: CRM

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Mercury : Dry Wt	0.0883	mg/kg	DA	0.0005	UKAS	LE	1042
Aluminium : Dry Wt	58700	mg/kg	DA	20	UKAS	LE	1043
Arsenic : Dry Wt	21.4	mg/kg	DA	0.04	UKAS	LE	1041
Cadmium : Dry Wt	0.239	mg/kg	DA	0.005	UKAS	LE	1041
Chromium : Dry Wt	91.8	mg/kg	DA	0.2	UKAS	LE	1041
Copper : Dry Wt	34.0	mg/kg	DA	0.7	UKAS	LE	1041
Lead : Dry Wt	20.1	mg/kg	DA	0.2	UKAS	LE	1041
Lithium : Dry Wt	76.1	mg/kg	DA	0.3	UKAS	LE	1041
Nickel : Dry Wt	45.7	mg/kg	DA	0.4	UKAS	LE	1041
Zinc : Dry Wt	160	mg/kg	DA	2	UKAS	LE	1041
Aldrin : Dry Wt	<1	ug/kg	DA	0.5	UKAS	LE	672
		ELEVATED_MRV : Matrix interference					
DDE -pp : Dry Wt	2.76	ug/kg	DA	0.1	UKAS	LE	672
DDT -op : Dry Wt	0.327	ug/kg	DA	0.1	UKAS	LE	672
DDT -pp : Dry Wt	0.856	ug/kg	DA	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<1	ug/kg	DA	0.5	UKAS	LE	672
		ELEVATED_MRV : Matrix interference					
Endrin : Dry Wt	<1	ug/kg	DA	0.5	UKAS	LE	672
		ELEVATED_MRV : Matrix interference					
HCH -alpha : Dry Wt	<0.3	ug/kg	DA	0.1	UKAS	LE	672
		ELEVATED_MRV : Matrix interference					
HCH -beta : Dry Wt	0.328	ug/kg	DA	0.1	UKAS	LE	672
HCH -delta : Dry Wt	0.366	ug/kg	DA	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.3	ug/kg	DA	0.1	UKAS	LE	672
		ELEVATED_MRV : Matrix interference					
Hexachlorobenzene : Dry Wt	9.23	ug/kg	DA	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.3	ug/kg	DA	0.1	UKAS	LE	672
		ELEVATED_MRV : Matrix interference					
Isodrin : Dry Wt	<1	ug/kg	DA	0.5	UKAS	LE	672
		ELEVATED_MRV : Matrix interference					
TDE - pp : Dry Wt	2.94	ug/kg	DA	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	32.4	ug/kg	DA	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	46.0	ug/kg	DA	1	None	LE	1051
Anthracene : Dry Wt	147	ug/kg	DA	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	262	ug/kg	DA	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	290	ug/kg	DA	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	394	ug/kg	DA	1	UKAS	LE	1051
Benzo(e) pyrene : Dry Wt	344	ug/kg	DA	5	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	276	ug/kg	DA	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	206	ug/kg	DA	1	UKAS	LE	1051
Chrysene : Dry Wt	274	ug/kg	DA	3	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	392	ug/kg	DA	3	None	LE	1051

Dibenzo(ah)anthracene : Dry Wt	78.1	ug/kg	DA	1	UKAS	LE	1051
Fluoranthene : Dry Wt	587	ug/kg	DA	1	UKAS	LE	1051
Fluorene : Dry Wt	39.1	ug/kg	DA	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	282	ug/kg	DA	1	UKAS	LE	1051
Naphthalene : Dry Wt	740	ug/kg	DA	5	UKAS	LE	1051
Phenanthrene : Dry Wt	350	ug/kg	DA	5	UKAS	LE	1051
Pyrene : Dry Wt	486	ug/kg	DA	1	UKAS	LE	1051
PCB - 028 : Dry Wt	3.81	ug/kg	DA	0.1	UKAS	LE	685
PCB - 052 : Dry Wt	4.77	ug/kg	DA	0.1	UKAS	LE	685
PCB - 101 : Dry Wt	4.48	ug/kg	DA	0.1	UKAS	LE	685
PCB - 118 : Dry Wt	3.54	ug/kg	DA	0.1	UKAS	LE	685
PCB - 138 : Dry Wt	3.10	ug/kg	DA	0.1	UKAS	LE	685
PCB - 153 : Dry Wt	4.62	ug/kg	DA	0.1	UKAS	LE	685
PCB - 180 : Dry Wt	3.12	ug/kg	DA	0.1	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	616	ug/kg	DA	3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	390	ug/kg	DA	3	UKAS	LE	897
Dry Solids @ 30°C	100	%	DA	0.5	None	LE	1130
Accreditation Assessment	NoResult	No.	DA	1	None	LE	924
Additional Material Present	Report	Text	DA	0	None	LE	924
Drying Method	Report	Text	DA	0	None	LE	924
Rejected Matter	NoResult	%	DA	0	None	LE	924
Sample Colour	Report	Text	DA	0	None	LE	924
Sample Matrix	Report	Text	DA	0	None	LE	924
Sample Preparation	Report	Text	DA		None	LE	924

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4d,4e,4f,4g

Folder No: 003078669

Sampled on: 26-Jan-15 @ 16:15

Comments: SITE 1

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	2.15	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	43.2	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	97.6	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0595	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.897	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0843	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0347	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.104	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0446	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	1.22	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.566	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0222	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0741	Unitless		-1	UKAS	LE	1368
Kurtosis	0.822	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	0.304	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.0196	mm		0	UKAS	LE	1368
Sorting Coefficient	2.41	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.38	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	2.45	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.66	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.09	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.46	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.08	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	6.06	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	6.48	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	4.89	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.70	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	6.00	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	3.12	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	7.02	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.70	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.01	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.81	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	8.15	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0585	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.21	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	8.20	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	6.46	%	0	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	158	mg/kg	0.3	UKAS	LE	402
Carbon : Dry Wt	35300	mg/kg	2000	UKAS	LE	606
Carbon, Organic : Dry Wt as C	1.38	%	0.1	UKAS	LE	535
Mercury : Dry Wt	0.0468	mg/kg	0.0005	UKAS	LE	1042
Aluminium : Dry Wt	27600	mg/kg	20	UKAS	LE	1043
Arsenic : Dry Wt	9.28	mg/kg	0.04	UKAS	LE	1041
Cadmium : Dry Wt	0.202	mg/kg	0.005	UKAS	LE	1041
Chromium : Dry Wt	43.7	mg/kg	0.2	UKAS	LE	1041
Copper : Dry Wt	18.7	mg/kg	0.7	UKAS	LE	1041
Lead : Dry Wt	27.8	mg/kg	0.2	UKAS	LE	1041
Lithium : Dry Wt	38.5	mg/kg	0.3	UKAS	LE	1041
Nickel : Dry Wt	23.9	mg/kg	0.4	UKAS	LE	1041
Zinc : Dry Wt	113	mg/kg	2	UKAS	LE	1041
Aldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
DDE -pp : Dry Wt	0.119	ug/kg	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
TDE - pp : Dry Wt	0.175	ug/kg	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	8.03	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	2.88	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	23.7	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	60.5	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	63.6	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	73.7	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	55.5	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	36.0	ug/kg	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	74.3	ug/kg	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	13.0	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	120	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	18.8	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	55.0	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	41.2	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	88.4	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	101	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.224	ug/kg	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 101 : Dry Wt	0.124	ug/kg		*0.1*	UKAS	LE	685
PCB - 118 : Dry Wt	0.173	ug/kg		*0.1*	UKAS	LE	685
PCB - 138 : Dry Wt	0.223	ug/kg		*0.1*	UKAS	LE	685
PCB - 153 : Dry Wt	0.224	ug/kg		*0.1*	UKAS	LE	685
PCB - 180 : Dry Wt	0.183	ug/kg		*0.1*	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	9.18	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<6	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.73	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	53.7	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	56.8	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	6.59	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be black clay sediment.

235.23g of the sample was taken for drying at <30degC which gave 129.34g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4e,4f

Folder No: 003078670

Sampled on: 26-Jan-15 @ 15:55

Comments: SITE 2

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	2.15	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	48.1	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0192	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0231	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0154	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0115	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0269	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.560	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0182	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.103	Unitless		-1	UKAS	LE	1368
Kurtosis	0.837	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	0.534	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.0154	mm		0	UKAS	LE	1368
Sorting Coefficient	2.31	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.81	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.0962	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.84	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.34	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.86	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	7.52	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	5.49	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	6.58	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	4.43	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	6.32	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.88	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.68	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	7.74	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.67	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.539	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.98	%		*0*	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	8.93	%		*0*	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.26	%		*0*	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	8.92	%		*0*	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	6.09	%		*0*	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	156	mg/kg		*0.3*	UKAS	LE	402
Carbon : Dry Wt	38100	mg/kg		*2000*	UKAS	LE	606
Carbon, Organic : Dry Wt as C	1.66	%		*0.1*	UKAS	LE	535
Mercury : Dry Wt	0.0533	mg/kg		*0.0005*	UKAS	LE	1042
Aluminium : Dry Wt	34000	mg/kg		*20*	UKAS	LE	1043
Arsenic : Dry Wt	10.9	mg/kg		*0.04*	UKAS	LE	1041
Cadmium : Dry Wt	0.154	mg/kg		*0.005*	UKAS	LE	1041
Chromium : Dry Wt	52.5	mg/kg		*0.2*	UKAS	LE	1041
Copper : Dry Wt	18.9	mg/kg		*0.7*	UKAS	LE	1041
Lead : Dry Wt	34.1	mg/kg		*0.2*	UKAS	LE	1041
Lithium : Dry Wt	46.4	mg/kg		*0.3*	UKAS	LE	1041
Nickel : Dry Wt	27.3	mg/kg		*0.4*	UKAS	LE	1041
Zinc : Dry Wt	103	mg/kg		*2*	UKAS	LE	1041
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<7	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.76	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	44.7	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	51.9	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	9.15	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be black clay sediment.

272.85g of the sample was taken for drying at <30degC which gave 126.30g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4d,4e,4f,4g

Folder No: 003078671

Sampled on: 26-Jan-15 @ 15:45

Comments: SITE 3

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	3.79	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	46.7	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0404	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0294	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0147	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0257	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00735	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.569	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0224	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0539	Unitless		-1	UKAS	LE	1368
Kurtosis	0.814	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	0.705	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.0203	mm		0	UKAS	LE	1368
Sorting Coefficient	2.40	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.44	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.118	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.63	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.05	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.44	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	6.96	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	6.20	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	6.32	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	4.92	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.67	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.85	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	3.41	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	6.94	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.71	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.92	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	6.06	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	8.01	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.869	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.55	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	8.06	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.140	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	6.72	%	0	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	167	mg/kg	0.3	UKAS	LE	402
Carbon : Dry Wt	53000	mg/kg	2000	UKAS	LE	606
Carbon, Organic : Dry Wt as C	1.51	%	0.1	UKAS	LE	535
Mercury : Dry Wt	0.0790	mg/kg	0.0005	UKAS	LE	1042
Aluminium : Dry Wt	33100	mg/kg	20	UKAS	LE	1043
Arsenic : Dry Wt	10.7	mg/kg	0.04	UKAS	LE	1041
Cadmium : Dry Wt	0.178	mg/kg	0.005	UKAS	LE	1041
Chromium : Dry Wt	50.9	mg/kg	0.2	UKAS	LE	1041
Copper : Dry Wt	18.5	mg/kg	0.7	UKAS	LE	1041
Lead : Dry Wt	32.6	mg/kg	0.2	UKAS	LE	1041
Lithium : Dry Wt	48.0	mg/kg	0.3	UKAS	LE	1041
Nickel : Dry Wt	26.7	mg/kg	0.4	UKAS	LE	1041
Zinc : Dry Wt	98.8	mg/kg	2	UKAS	LE	1041
Aldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
DDE -pp : Dry Wt	0.148	ug/kg	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
TDE - pp : Dry Wt	0.206	ug/kg	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	5.31	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	2.02	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	14.6	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	48.5	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	65.9	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	85.3	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	56.0	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	41.1	ug/kg	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	68.0	ug/kg	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	12.8	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	90.7	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	15.4	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	60.5	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	32.8	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	67.0	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	75.0	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.323	ug/kg	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	0.129	ug/kg		*0.1*	UKAS	LE	685
PCB - 101 : Dry Wt	0.160	ug/kg		*0.1*	UKAS	LE	685
PCB - 118 : Dry Wt	0.238	ug/kg		*0.1*	UKAS	LE	685
PCB - 138 : Dry Wt	0.244	ug/kg		*0.1*	UKAS	LE	685
PCB - 153 : Dry Wt	0.251	ug/kg		*0.1*	UKAS	LE	685
PCB - 180 : Dry Wt	0.124	ug/kg		*0.1*	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<6	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.66	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	48.6	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	53.3	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	9.42	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be black clay sediment.

284.47g of the sample was taken for drying at <30degC which gave 141.23g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4d,4e,4f,4g

Folder No: 003078672

Sampled on: 26-Jan-15 @ 15:35

Comments: SITE 4

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	1.89	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	47.1	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	99.1	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.145	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.166	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.172	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.129	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.148	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.0400	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.111	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.596	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0233	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.00422	Unitless		-1	UKAS	LE	1368
Kurtosis	0.746	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	0.937	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.0221	mm		0	UKAS	LE	1368
Sorting Coefficient	2.37	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.46	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.911	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.62	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.09	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.45	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	6.56	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	8.75	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.98	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.39	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.63	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	5.53	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.75	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	6.80	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	5.17	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.198	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.38	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	7.73	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	6.59	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	7.66	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	8.35	%	0	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	187	mg/kg	0.3	UKAS	LE	402
Carbon : Dry Wt	34500	mg/kg	2000	UKAS	LE	606
Carbon, Organic : Dry Wt as C	1.56	%	0.1	UKAS	LE	535
Mercury : Dry Wt	0.0532	mg/kg	0.0005	UKAS	LE	1042
Aluminium : Dry Wt	31800	mg/kg	20	UKAS	LE	1043
Arsenic : Dry Wt	10.1	mg/kg	0.04	UKAS	LE	1041
Cadmium : Dry Wt	0.153	mg/kg	0.005	UKAS	LE	1041
Chromium : Dry Wt	48.8	mg/kg	0.2	UKAS	LE	1041
Copper : Dry Wt	17.6	mg/kg	0.7	UKAS	LE	1041
Lead : Dry Wt	31.8	mg/kg	0.2	UKAS	LE	1041
Lithium : Dry Wt	44.1	mg/kg	0.3	UKAS	LE	1041
Nickel : Dry Wt	25.1	mg/kg	0.4	UKAS	LE	1041
Zinc : Dry Wt	95.9	mg/kg	2	UKAS	LE	1041
Aldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
DDE -pp : Dry Wt	0.196	ug/kg	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	0.261	ug/kg	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
TDE - pp : Dry Wt	0.238	ug/kg	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	5.63	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	3.96	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	19.2	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	53.5	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	62.0	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	79.1	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	64.7	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	37.1	ug/kg	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	75.9	ug/kg	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	14.7	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	106	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	15.8	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	66.3	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	31.9	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	75.1	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	84.8	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	0.330	ug/kg	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	0.107	ug/kg		*0.1*	UKAS	LE	685
PCB - 101 : Dry Wt	0.143	ug/kg		*0.1*	UKAS	LE	685
PCB - 118 : Dry Wt	0.218	ug/kg		*0.1*	UKAS	LE	685
PCB - 138 : Dry Wt	0.212	ug/kg		*0.1*	UKAS	LE	685
PCB - 153 : Dry Wt	0.231	ug/kg		*0.1*	UKAS	LE	685
PCB - 180 : Dry Wt	0.129	ug/kg		*0.1*	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<6	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.81	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	47.6	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	52.9	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	8.45	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be black clay sediment.

242.46g of the sample was taken for drying at <30degC which gave 118.44g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4d,4e,4f,4g

Folder No: 003078673

Sampled on: 26-Jan-15 @ 15:25

Comments: SITE 5

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	1.99	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	39.6	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	99.6	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0465	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0897	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0399	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0498	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0631	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0864	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00997	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sandy mud in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.595	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.0285	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.152	Unitless		-1	UKAS	LE	1368
Kurtosis	0.749	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	0.960	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.0334	mm		0	UKAS	LE	1368
Sorting Coefficient	2.39	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.27	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.385	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.48	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.87	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.11	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.69	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	9.62	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.19	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.80	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.05	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	4.83	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	3.76	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	6.06	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	4.83	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.49	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.86	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	6.82	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.209	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.00	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	6.69	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	9.98	%	0	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	263	mg/kg	0.3	UKAS	LE	402
Carbon : Dry Wt	33500	mg/kg	2000	UKAS	LE	606
Carbon, Organic : Dry Wt as C	1.36	%	0.1	UKAS	LE	535
Mercury : Dry Wt	0.0421	mg/kg	0.0005	UKAS	LE	1042
Aluminium : Dry Wt	22300	mg/kg	20	UKAS	LE	1043
Arsenic : Dry Wt	8.22	mg/kg	0.04	UKAS	LE	1041
Cadmium : Dry Wt	0.158	mg/kg	0.005	UKAS	LE	1041
Chromium : Dry Wt	36.6	mg/kg	0.2	UKAS	LE	1041
Copper : Dry Wt	14.7	mg/kg	0.7	UKAS	LE	1041
Lead : Dry Wt	25.1	mg/kg	0.2	UKAS	LE	1041
Lithium : Dry Wt	31.3	mg/kg	0.3	UKAS	LE	1041
Nickel : Dry Wt	19.6	mg/kg	0.4	UKAS	LE	1041
Zinc : Dry Wt	75.5	mg/kg	2	UKAS	LE	1041
Aldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
DDE -pp : Dry Wt	0.148	ug/kg	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	0.241	ug/kg	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.2	ug/kg	0.1	UKAS	LE	672
		ELEVATED_MRV : Matrix interference				
Acenaphthene : Dry Wt	11.6	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	8.34	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	56.7	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	134	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	130	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	117	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	86.6	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	63.3	ug/kg	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	152	ug/kg	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	22.1	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	285	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	24.8	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	90.0	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	30.2	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	191	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	244	ug/kg	1	UKAS	LE	1051

PCB - 028 : Dry Wt	0.249	ug/kg		*0.1*	UKAS	LE	685
PCB - 052 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 101 : Dry Wt	0.110	ug/kg		*0.1*	UKAS	LE	685
PCB - 118 : Dry Wt	0.158	ug/kg		*0.1*	UKAS	LE	685
PCB - 138 : Dry Wt	0.162	ug/kg		*0.1*	UKAS	LE	685
PCB - 153 : Dry Wt	0.160	ug/kg		*0.1*	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<5	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.92	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	57.6	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	60.4	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	6.75	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be black clay sediment.

271.05g of the sample was taken for drying at <30degC which gave 158.68g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c

Folder No: 003078674

Sampled on: 26-Jan-15 @ 15:05

Comments: SITE 6

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	0.559	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	21.0	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	85.5	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	3.32	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	3.79	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	2.67	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	1.65	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	1.34	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.876	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.357	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.494	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.327	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.344	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.392	Unitless		-1	UKAS	LE	1368
Kurtosis	1.61	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	11.2	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.303	mm		0	UKAS	LE	1368
Sorting Coefficient	1.11	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	14.5	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.0626	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	9.46	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.00894	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	23.9	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	28.1	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.0536	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	16.6	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.0804	%		*0*	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	5.12	%		*0*	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.0804	%		*0*	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	1.31	%		*0*	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	0.733	%		*0*	UKAS	LE	1370
Carbon : Dry Wt	7650	mg/kg		*2000*	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.206	%		*0.1*	UKAS	LE	535
Mercury : Dry Wt	0.00302	mg/kg		*0.0005*	UKAS	LE	1042
Aluminium : Dry Wt	4120	mg/kg		*20*	UKAS	LE	1043
Barium : Dry Wt	15.3	mg/kg		*0.4*	UKAS	LE	1043
Iron : Dry Wt	6900	mg/kg		*20*	UKAS	LE	1043
Strontium : Dry Wt	223	mg/kg		*0.2*	UKAS	LE	1043
Arsenic : Dry Wt	5.86	mg/kg		*0.04*	UKAS	LE	1041
Boron : Dry Wt	NoResult	mg/kg		*10*	None	LE	1041
Cadmium : Dry Wt	0.0430	mg/kg		*0.005*	UKAS	LE	1041
Chromium : Dry Wt	8.97	mg/kg		*0.2*	UKAS	LE	1041
Copper : Dry Wt	2.02	mg/kg		*0.7*	UKAS	LE	1041
Lead : Dry Wt	8.29	mg/kg		*0.2*	UKAS	LE	1041
Lithium : Dry Wt	9.56	mg/kg		*0.3*	UKAS	LE	1041
Manganese : Dry Wt	259	mg/kg		*0.2*	UKAS	LE	1041
Nickel : Dry Wt	6.22	mg/kg		*0.4*	UKAS	LE	1041
Vanadium : Dry Wt	16.2	mg/kg		*0.1*	UKAS	LE	1041
Zinc : Dry Wt	315	mg/kg		*2*	UKAS	LE	1041
Density	2.26	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	80.8	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	79.0	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	1.33	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy sediment + shells + stones.

241.07g of the sample was taken for drying at <30degC which gave 196.01g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c

Folder No: 003078675

Sampled on: 26-Jan-15 @ 14:55

Comments: SITE 7

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	1.35	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	22.7	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	93.9	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	1.45	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	1.67	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	1.02	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.827	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.616	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.338	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.192	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.313	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.270	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.248	Unitless		-1	UKAS	LE	1368
Kurtosis	1.68	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	4.26	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.263	mm		0	UKAS	LE	1368
Sorting Coefficient	0.796	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	6.11	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.207	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	12.7	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.0939	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	30.4	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.0939	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	32.1	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.207	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	14.4	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.207	%		*0*	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	2.08	%		*0*	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.207	%		*0*	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00939	%		*0*	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	1.12	%		*0*	UKAS	LE	1370
Carbon : Dry Wt	14900	mg/kg		*2000*	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.140	%		*0.1*	UKAS	LE	535
Mercury : Dry Wt	0.00347	mg/kg		*0.0005*	UKAS	LE	1042
Aluminium : Dry Wt	4170	mg/kg		*20*	UKAS	LE	1043
Barium : Dry Wt	15.3	mg/kg		*0.4*	UKAS	LE	1043
Iron : Dry Wt	6390	mg/kg		*20*	UKAS	LE	1043
Strontium : Dry Wt	98.4	mg/kg		*0.2*	UKAS	LE	1043
Arsenic : Dry Wt	5.38	mg/kg		*0.04*	UKAS	LE	1041
Boron : Dry Wt	NoResult	mg/kg		*10*	None	LE	1041
Cadmium : Dry Wt	0.0420	mg/kg		*0.005*	UKAS	LE	1041
Chromium : Dry Wt	9.23	mg/kg		*0.2*	UKAS	LE	1041
Copper : Dry Wt	1.96	mg/kg		*0.7*	UKAS	LE	1041
Lead : Dry Wt	8.72	mg/kg		*0.2*	UKAS	LE	1041
Lithium : Dry Wt	6.59	mg/kg		*0.3*	UKAS	LE	1041
Manganese : Dry Wt	313	mg/kg		*0.2*	UKAS	LE	1041
Nickel : Dry Wt	5.81	mg/kg		*0.4*	UKAS	LE	1041
Vanadium : Dry Wt	15.9	mg/kg		*0.1*	UKAS	LE	1041
Zinc : Dry Wt	23.3	mg/kg		*2*	UKAS	LE	1041
Density	2.23	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	77.3	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	77.3	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	1.23	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy sediment + shells + stones.

245.58g of the sample was taken for drying at <30degC which gave 191.11g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c

Folder No: 003078676

Sampled on: 26-Jan-15 @ 14:45

Comments: SITE 8

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	1.30	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	23.4	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	95.6	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	1.18	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0753	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	1.29	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.846	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.568	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.315	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.173	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.421	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.232	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0275	Unitless		-1	UKAS	LE	1368
Kurtosis	1.25	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	3.47	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.233	mm		0	UKAS	LE	1368
Sorting Coefficient	0.724	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	4.45	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.0287	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.277	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.420	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	18.2	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.420	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	30.6	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.487	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.306	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	26.9	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.573	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	10.9	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.592	%		*0*	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	1.44	%		*0*	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.0573	%		*0*	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.506	%		*0*	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	3.76	%		*0*	UKAS	LE	1370
Carbon : Dry Wt	14800	mg/kg		*2000*	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.182	%		*0.1*	UKAS	LE	535
Mercury : Dry Wt	0.00649	mg/kg		*0.0005*	UKAS	LE	1042
Aluminium : Dry Wt	4870	mg/kg		*20*	UKAS	LE	1043
Barium : Dry Wt	18.8	mg/kg		*0.4*	UKAS	LE	1043
Iron : Dry Wt	7040	mg/kg		*20*	UKAS	LE	1043
Strontium : Dry Wt	123	mg/kg		*0.2*	UKAS	LE	1043
Arsenic : Dry Wt	4.94	mg/kg		*0.04*	UKAS	LE	1041
Boron : Dry Wt	NoResult	mg/kg		*10*	None	LE	1041
Cadmium : Dry Wt	0.0440	mg/kg		*0.005*	UKAS	LE	1041
Chromium : Dry Wt	11.7	mg/kg		*0.2*	UKAS	LE	1041
Copper : Dry Wt	2.73	mg/kg		*0.7*	UKAS	LE	1041
Lead : Dry Wt	9.80	mg/kg		*0.2*	UKAS	LE	1041
Lithium : Dry Wt	7.24	mg/kg		*0.3*	UKAS	LE	1041
Manganese : Dry Wt	319	mg/kg		*0.2*	UKAS	LE	1041
Nickel : Dry Wt	6.64	mg/kg		*0.4*	UKAS	LE	1041
Vanadium : Dry Wt	17.8	mg/kg		*0.1*	UKAS	LE	1041
Zinc : Dry Wt	27.4	mg/kg		*2*	UKAS	LE	1041
Density	2.15	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	79.4	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	76.6	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	1.37	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy sediment + shells + stones.

235.56g of the sample was taken for drying at <30degC which gave 188.33g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c

Folder No: 003078677

Sampled on: 26-Jan-15 @ 14:35

Comments: SITE 9

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	0.667	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	22.1	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	96.5	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.957	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0623	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	1.11	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.676	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.400	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.189	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.106	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.493	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.238	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.0460	Unitless		-1	UKAS	LE	1368
Kurtosis	1.02	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	3.28	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.238	mm		0	UKAS	LE	1368
Sorting Coefficient	0.552	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	3.50	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	17.6	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	35.1	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	31.0	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	10.2	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.347	%		0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.00965	%		0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	2.19	%		0	UKAS	LE	1370
Carbon : Dry Wt	8250	mg/kg	DC	2000	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.158	%	DC	0.1	UKAS	LE	535
Mercury : Dry Wt	0.00265	mg/kg		0.0005	UKAS	LE	1042
Aluminium : Dry Wt	3050	mg/kg		20	UKAS	LE	1043
Barium : Dry Wt	9.28	mg/kg		0.4	UKAS	LE	1043
Iron : Dry Wt	5670	mg/kg		20	UKAS	LE	1043
Strontium : Dry Wt	81.7	mg/kg		0.2	UKAS	LE	1043
Arsenic : Dry Wt	4.98	mg/kg		0.04	UKAS	LE	1041
Boron : Dry Wt	NoResult	mg/kg		10	None	LE	1041
Cadmium : Dry Wt	0.0330	mg/kg		0.005	UKAS	LE	1041
Chromium : Dry Wt	8.00	mg/kg		0.2	UKAS	LE	1041
Copper : Dry Wt	1.67	mg/kg		0.7	UKAS	LE	1041
Lead : Dry Wt	7.03	mg/kg		0.2	UKAS	LE	1041
Lithium : Dry Wt	5.38	mg/kg		0.3	UKAS	LE	1041
Manganese : Dry Wt	264	mg/kg		0.2	UKAS	LE	1041
Nickel : Dry Wt	5.07	mg/kg		0.4	UKAS	LE	1041
Vanadium : Dry Wt	12.8	mg/kg		0.1	UKAS	LE	1041
Zinc : Dry Wt	21.9	mg/kg		2	UKAS	LE	1041
Density	2.29	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	77.5	%		0.5	None	LE	1130
Dry Solids @ 105°C	77.9	%	DC	0.5	UKAS	LE	911
Loss on Ignition @ 500°C	1.02	%	DC	0.5	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		0	None	LE	924
Drying Method	Report	Text		0	None	LE	924
Rejected Matter	NoResult	%		0	None	LE	924
Sample Colour	Report	Text		0	None	LE	924
Sample Matrix	Report	Text		0	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy sediment + shells + stones.

249.60g of the sample was taken for drying at <30degC which gave 194.77g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4d,4e,4f,4g

Folder No: 003078678

Sampled on: 26-Jan-15 @ 14:25

Comments: SITE 10

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	0.401	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	23.5	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	94.9	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	1.33	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.186	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	1.23	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.880	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.660	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.351	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.260	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.190	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.333	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.212	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	0.152	Unitless		-1	UKAS	LE	1368
Kurtosis	1.58	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	3.69	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.211	mm		0	UKAS	LE	1368
Sorting Coefficient	0.860	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	5.08	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.0978	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.313	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.567	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	22.7	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.538	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	31.6	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.567	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.342	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	22.3	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.685	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	6.31	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%	0	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.724	%	0	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.372	%	0	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.293	%	0	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.655	%	0	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.557	%	0	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	6.32	%	0	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	10.3	mg/kg	0.3	UKAS	LE	402
Carbon : Dry Wt	9850	mg/kg	2000	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.584	%	0.1	UKAS	LE	535
Mercury : Dry Wt	0.00651	mg/kg	0.0005	UKAS	LE	1042
Aluminium : Dry Wt	4990	mg/kg	20	UKAS	LE	1043
Arsenic : Dry Wt	4.41	mg/kg	0.04	UKAS	LE	1041
Cadmium : Dry Wt	0.0500	mg/kg	0.005	UKAS	LE	1041
Chromium : Dry Wt	11.7	mg/kg	0.2	UKAS	LE	1041
Copper : Dry Wt	2.99	mg/kg	0.7	UKAS	LE	1041
Lead : Dry Wt	8.12	mg/kg	0.2	UKAS	LE	1041
Lithium : Dry Wt	7.31	mg/kg	0.3	UKAS	LE	1041
Nickel : Dry Wt	6.46	mg/kg	0.4	UKAS	LE	1041
Zinc : Dry Wt	30.3	mg/kg	2	UKAS	LE	1041
Aldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	0.5	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	672
Acenaphthene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	1	None	LE	1051
Anthracene : Dry Wt	1.08	ug/kg	1	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	3.74	ug/kg	1	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	3.05	ug/kg	1	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	5.47	ug/kg	1	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	4.44	ug/kg	1	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	2.63	ug/kg	1	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	5.03	ug/kg	3	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	1	UKAS	LE	1051
Fluoranthene : Dry Wt	8.84	ug/kg	1	UKAS	LE	1051
Fluorene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	4.30	ug/kg	1	UKAS	LE	1051
Naphthalene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Phenanthrene : Dry Wt	<5	ug/kg	5	UKAS	LE	1051
Pyrene : Dry Wt	8.30	ug/kg	1	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	0.1	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	2.18	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	73.2	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	76.5	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	1.51	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy clay sediment.

187.14g of the sample was taken for drying at <30degC which gave 138.55g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4e,4f

Folder No: 003078679

Sampled on: 26-Jan-15 @ 14:20

Comments: SITE 11

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	1.20	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	22.8	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	96.2	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.947	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.281	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.893	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.622	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.529	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.305	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.151	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.119	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.236	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.198	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.215	Unitless		-1	UKAS	LE	1368
Kurtosis	2.08	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	3.30	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.197	mm		0	UKAS	LE	1368
Sorting Coefficient	1.02	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	3.85	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.192	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.423	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.673	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	25.3	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.654	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	31.0	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.721	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.442	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	19.6	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.846	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.0673	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	4.80	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.885	%		*0*	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.221	%		*0*	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.702	%		*0*	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.798	%		*0*	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	8.84	%		*0*	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	13.3	mg/kg		*0.3*	UKAS	LE	402
Carbon : Dry Wt	14300	mg/kg		*2000*	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.232	%	*DC*	*0.1*	UKAS	LE	535
Mercury : Dry Wt	0.00676	mg/kg		*0.0005*	UKAS	LE	1042
Aluminium : Dry Wt	5530	mg/kg		*20*	UKAS	LE	1043
Arsenic : Dry Wt	4.65	mg/kg		*0.04*	UKAS	LE	1041
Cadmium : Dry Wt	0.0550	mg/kg		*0.005*	UKAS	LE	1041
Chromium : Dry Wt	12.8	mg/kg		*0.2*	UKAS	LE	1041
Copper : Dry Wt	3.01	mg/kg		*0.7*	UKAS	LE	1041
Lead : Dry Wt	8.96	mg/kg		*0.2*	UKAS	LE	1041
Lithium : Dry Wt	8.57	mg/kg		*0.3*	UKAS	LE	1041
Nickel : Dry Wt	7.35	mg/kg		*0.4*	UKAS	LE	1041
Zinc : Dry Wt	31.2	mg/kg		*2*	UKAS	LE	1041
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	2.17	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	78.3	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	77.2	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	1.46	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy clay sediment.

262.96g of the sample was taken for drying at <30degC which gave 207.09g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4d,4e,4f,4g

Folder No: 003078680

Sampled on: 26-Jan-15 @ 14:05

Comments: SITE 12

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	0.989	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	23.5	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	94.3	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.899	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.876	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.607	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.453	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	1.84	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.348	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.383	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.315	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.118	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.188	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.120	Unitless		-1	UKAS	LE	1368
Kurtosis	3.08	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	10.1	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.190	mm		0	UKAS	LE	1368
Sorting Coefficient	1.44	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.245	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	5.72	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.198	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.302	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.537	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.801	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	25.1	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.801	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	28.8	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.896	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.726	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	17.3	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	1.06	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.283	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	3.85	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%	*0*	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	1.13	%	*0*	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.113	%	*0*	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	1.18	%	*0*	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.999	%	*0*	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	*0*	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	10.0	%	*0*	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	14.7	mg/kg	*0.3*	UKAS	LE	402
Carbon : Dry Wt	11900	mg/kg	*2000*	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.201	%	*0.1*	UKAS	LE	535
Mercury : Dry Wt	0.00788	mg/kg	*0.0005*	UKAS	LE	1042
Aluminium : Dry Wt	6530	mg/kg	*20*	UKAS	LE	1043
Arsenic : Dry Wt	5.32	mg/kg	*0.04*	UKAS	LE	1041
Cadmium : Dry Wt	0.0580	mg/kg	*0.005*	UKAS	LE	1041
Chromium : Dry Wt	15.6	mg/kg	*0.2*	UKAS	LE	1041
Copper : Dry Wt	3.02	mg/kg	*0.7*	UKAS	LE	1041
Lead : Dry Wt	9.53	mg/kg	*0.2*	UKAS	LE	1041
Lithium : Dry Wt	7.01	mg/kg	*0.3*	UKAS	LE	1041
Nickel : Dry Wt	7.95	mg/kg	*0.4*	UKAS	LE	1041
Zinc : Dry Wt	33.3	mg/kg	*2*	UKAS	LE	1041
Aldrin : Dry Wt	<0.5	ug/kg	*0.5*	UKAS	LE	672
DDE -pp : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
DDT -op : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
DDT -pp : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
Dieldrin : Dry Wt	<0.5	ug/kg	*0.5*	UKAS	LE	672
Endrin : Dry Wt	<0.5	ug/kg	*0.5*	UKAS	LE	672
HCH -alpha : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
HCH -beta : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
HCH -delta : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
HCH -gamma : Dry Wt :- {Lindane}	<0.1	ug/kg	*0.1*	UKAS	LE	672
Hexachlorobenzene : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
Hexachlorobutadiene : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
Isodrin : Dry Wt	<0.5	ug/kg	*0.5*	UKAS	LE	672
TDE - pp : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	672
Acenaphthene : Dry Wt	<1	ug/kg	*1*	UKAS	LE	1051
Acenaphthylene : Dry Wt	<1	ug/kg	*1*	None	LE	1051
Anthracene : Dry Wt	1.23	ug/kg	*1*	UKAS	LE	1051
Benzo(a)anthracene : Dry Wt	2.95	ug/kg	*1*	UKAS	LE	1051
Benzo(a)pyrene : Dry Wt	8.14	ug/kg	*1*	UKAS	LE	1051
Benzo(b)fluoranthene : Dry Wt	5.46	ug/kg	*1*	UKAS	LE	1051
Benzo(ghi)perylene : Dry Wt	4.23	ug/kg	*1*	UKAS	LE	1051
Benzo(k)fluoranthene : Dry Wt	2.55	ug/kg	*1*	UKAS	LE	1051
Chrysene + Triphenylene : Dry Wt	4.25	ug/kg	*3*	None	LE	1051
Dibenzo(ah)anthracene : Dry Wt	<1	ug/kg	*1*	UKAS	LE	1051
Fluoranthene : Dry Wt	5.31	ug/kg	*1*	UKAS	LE	1051
Fluorene : Dry Wt	<5	ug/kg	*5*	UKAS	LE	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	4.42	ug/kg	*1*	UKAS	LE	1051
Naphthalene : Dry Wt	<5	ug/kg	*5*	UKAS	LE	1051
Phenanthrene : Dry Wt	<5	ug/kg	*5*	UKAS	LE	1051
Pyrene : Dry Wt	4.83	ug/kg	*1*	UKAS	LE	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	*0.1*	UKAS	LE	685

PCB - 052 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 101 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 118 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 138 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 153 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
PCB - 180 : Dry Wt	<0.1	ug/kg		*0.1*	UKAS	LE	685
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	2.13	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	77.1	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	76.5	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	1.59	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy clay sediment.

231.18g of the sample was taken for drying at <30degC which gave 179.66g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Quote Description: 2,3,4a,4b,4c,4e,4f

Folder No: 003078681

Sampled on: 26-Jan-15 @ 13:50

Comments: SITE 13

Quote No: 12080

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	0.772	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	21.2	%	DC		None	NLS	864
Grain Size Fraction : <1000 microns : {>0 phi}	97.9	%		0	UKAS	LE	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.503	%		0	UKAS	LE	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.493	%		0	UKAS	LE	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.313	%		0	UKAS	LE	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.271	%		0	UKAS	LE	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.180	%		0	UKAS	LE	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	UKAS	LE	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.280	%		0	UKAS	LE	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.102	%		0	UKAS	LE	1369
Particle Size Report	Report	Text			UKAS	LE	1369
The sample received was a slightly gravelly sand in a pot. The entire sample was analysed.							
Raw Data Report	Report	Text			UKAS	LE	1369
Grain Size Inclusive Kurtosis	0.165	mm		0	UKAS	LE	1368
Grain Size Inclusive Mean	0.165	mm		0	UKAS	LE	1368
Inclusive Graphic Skewness :- {SKI}	-0.370	Unitless		-1	UKAS	LE	1368
Kurtosis	2.60	Unitless		0	UKAS	LE	1368
Particle Diameter : Mean	2.41	mm		0	UKAS	LE	1368
Particle Diameter : Median	0.171	mm		0	UKAS	LE	1368
Sorting Coefficient	1.22	Unitless		0	UKAS	LE	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.382	%		0	UKAS	LE	1370
Grain Size Fraction : >1000 microns : {<0 phi}	2.14	%		0	UKAS	LE	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.254	%		0	UKAS	LE	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.372	%		0	UKAS	LE	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.665	%		0	UKAS	LE	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.959	%		0	UKAS	LE	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	27.9	%		0	UKAS	LE	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.959	%		0	UKAS	LE	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	28.4	%		0	UKAS	LE	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	1.11	%		0	UKAS	LE	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.891	%		0	UKAS	LE	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	14.5	%		0	UKAS	LE	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	1.29	%		0	UKAS	LE	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.352	%		0	UKAS	LE	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	2.13	%		0	UKAS	LE	1370

Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.0294	%		*0*	UKAS	LE	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	1.38	%		*0*	UKAS	LE	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0196	%		*0*	UKAS	LE	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	2.12	%		*0*	UKAS	LE	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	1.21	%		*0*	UKAS	LE	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		*0*	UKAS	LE	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	13.0	%		*0*	UKAS	LE	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	33.4	mg/kg		*0.3*	UKAS	LE	402
Carbon : Dry Wt	10900	mg/kg		*2000*	UKAS	LE	606
Carbon, Organic : Dry Wt as C	0.318	%		*0.1*	UKAS	LE	535
Mercury : Dry Wt	0.0122	mg/kg		*0.0005*	UKAS	LE	1042
Aluminium : Dry Wt	7810	mg/kg		*20*	UKAS	LE	1043
Arsenic : Dry Wt	4.69	mg/kg		*0.04*	UKAS	LE	1041
Cadmium : Dry Wt	0.0660	mg/kg		*0.005*	UKAS	LE	1041
Chromium : Dry Wt	16.1	mg/kg		*0.2*	UKAS	LE	1041
Copper : Dry Wt	3.50	mg/kg		*0.7*	UKAS	LE	1041
Lead : Dry Wt	10.9	mg/kg		*0.2*	UKAS	LE	1041
Lithium : Dry Wt	12.0	mg/kg		*0.3*	UKAS	LE	1041
Nickel : Dry Wt	8.21	mg/kg		*0.4*	UKAS	LE	1041
Zinc : Dry Wt	35.3	mg/kg		*2*	UKAS	LE	1041
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg	*DC*	*3*	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	2.31	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	75.6	%		*0.5*	None	LE	1130
Dry Solids @ 105°C	78.8	%	*DC*	*0.5*	UKAS	LE	911
Loss on Ignition @ 500°C	1.69	%	*DC*	*0.5*	UKAS	LE	911
Accreditation Assessment	2	No.			None	LE	924
Additional Material Present	Report	Text		*0*	None	LE	924
Drying Method	Report	Text		*0*	None	LE	924
Rejected Matter	NoResult	%		*0*	None	LE	924
Sample Colour	Report	Text		*0*	None	LE	924
Sample Matrix	Report	Text		*0*	None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be brown sandy clay sediment.

232.52g of the sample was taken for drying at <30degC which gave 177.17g of dried sample (weights include tray weight).
The sample was crushed using a jaw crusher.
The sample was then sieved until it passed through a 2mm sieve.
The sample was received unpreserved.

All parameters are determined on the air-dried (<30degC) portion except those requiring a wet sample fraction where as received (wet) sample was used.

Dry Weight (DW) results are reported as determined at <30degC.

National Laboratory Service

Analytical Report

Final Report

Report ID - 20074544 - 1

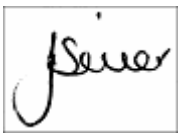
Batch description: Dun Laoghaire

UKAS TESTING 0754

Reported on: 19-Mar-2015

Method Description Summary for all samples in batch Number 20074544

402	LE I Hydrocarbons by UV- methanol digested, pentane xch, by UV fluorescence spectrometry
535	LE I TOC 01 - combusted with oxygen; thermal conductivity detection
606	LE I TOC 01 - TC & TN - combusted with oxygen; thermal conductivity detection
672	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
685	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
864	Parameter by calculation
881	Density - volume taken; mass determined; density calculated
897	LE O Organotins (GCMS) 01 - acetic acid/methanol extracted; derivatised; determined GCMS (SIM); from "as received" sample
911	LE I Dry Solids & LoI 01 - Dry Solids (105C), Loss on Ignition (500C) - thermally treated; determined by gravimetry
924	Sample Preparation; Dry Solids (30°C); from "as received" sample
1041	LE M Metals ICP-MS Sediment - microwave aqua regia digested, determined by ICPMS, samples are sieved to <2000um.
1042	LE M Mercury CSEMP - microwave aqua regia digeste, acidic SnCl2 reduced, determined by CV-AFS. Samples are sieved to <2000um.
1043	LE M Metals Marine (ICPOES) - microwave aqua regia digested, determined by ICPOES, samples are sieved to <2000um.
1051	LE O OCP_PAH_PCB in Marine Biota and Sediment - solvent extracted, determined by GCMS QQQ
1130	LE P Soil Preparation 01: The sample is air-dried at <30ºC in a controlled environment until a constant weight it achieved.
1368	LE P Particle Size Sediment by Laser Diffraction - various parameters calculated from the band sizes produced by laser beam diffraction technique
1369	LE P Particle Size Sediment Sieve - various band sizes >1000mm - determined by manual sieving.
1370	LE P Particle Size Sediment by Laser Diffraction - various band sizes <1000mm - determined by laser beam diffraction instrumentation.



Jo Senior
Laboratory Site Manager

All reporting limits quoted are those achievable for clean samples of the relevant matrix. No allowance is made for instances when dilutions are necessary owing to the nature of the sample or insufficient volume of the sample being available. In these cases higher reporting limits may be quoted and will be above the MRV.

Solid sample results are determined on a "dried" sample fraction except for parameters where the method description identifies that "as received" sample was used.

Key to Results Flags:

DA Sampling date/time has not been provided and no assessment of sample stability can be made. It is possible that the results may be compromised.

DC Analysis started outside of specified holding time. It is possible that the results may be compromised.

The analysis start date specified is the date of the first test, dates for other analysis are available on request.

Please note all samples will be retained for 10 working days for aqueous samples and 30 working days for solid samples after reporting unless otherwise agreed with Customer Services

Key to Accreditation: UKAS = Methodology accredited to ISO/IEC 17025:2005, MCertS = Methodology accredited to MCertS Performance Standard for testing of soils, none = Methodology not accredited

Key to Lab ID: LE = Leeds, NM = Nottingham, SX = Starcross, SC = Sub-Contracted outside NLS, FI = Field Data - outside NLS, NLS = Calculated

Any subsequent version of this report denoted with a higher version number will supersede this and any previous versions

END OF TEST REPORT

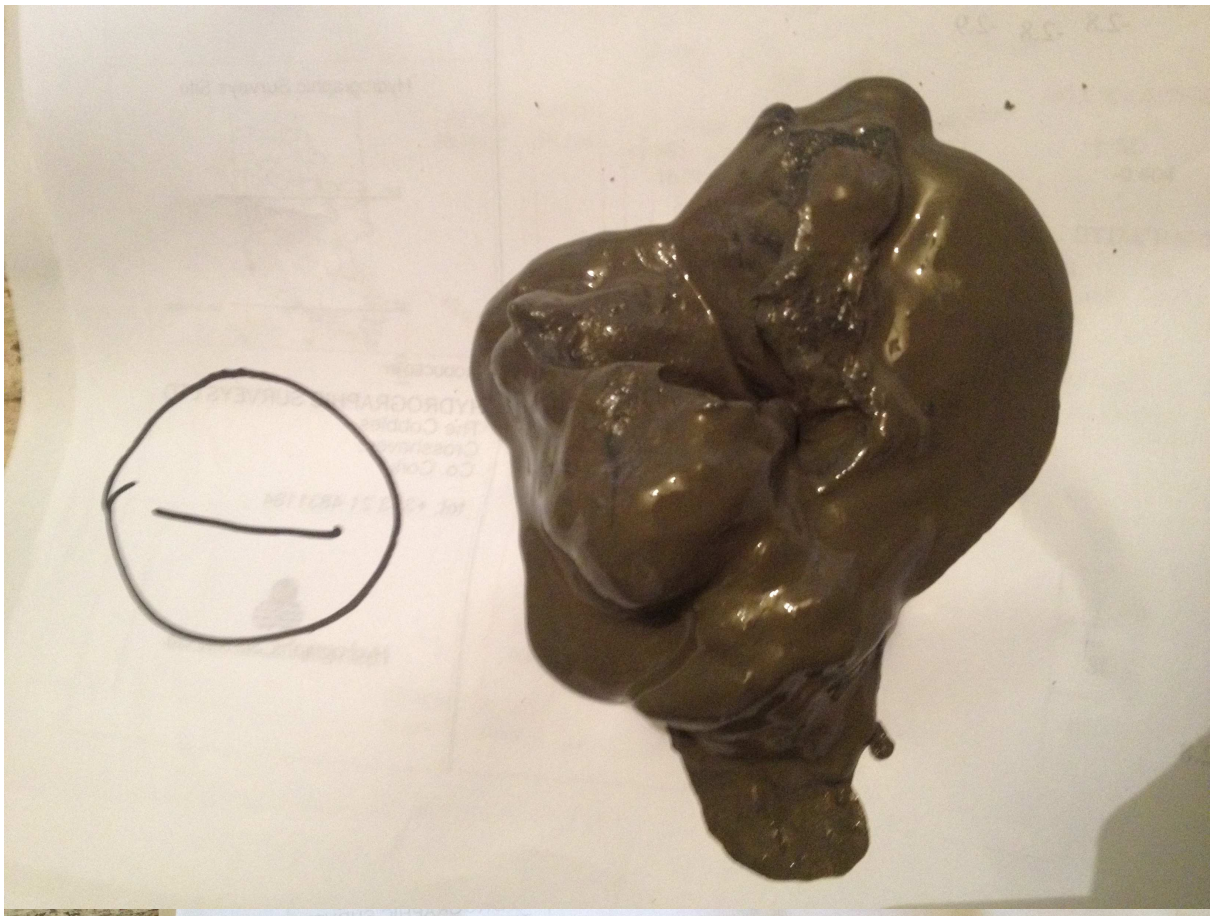
APPENDIX 2

Dun Laoghaire Sampling_DAS material analysis reporting form_Final

APPENDIX 3

Sample Images

M1 – M13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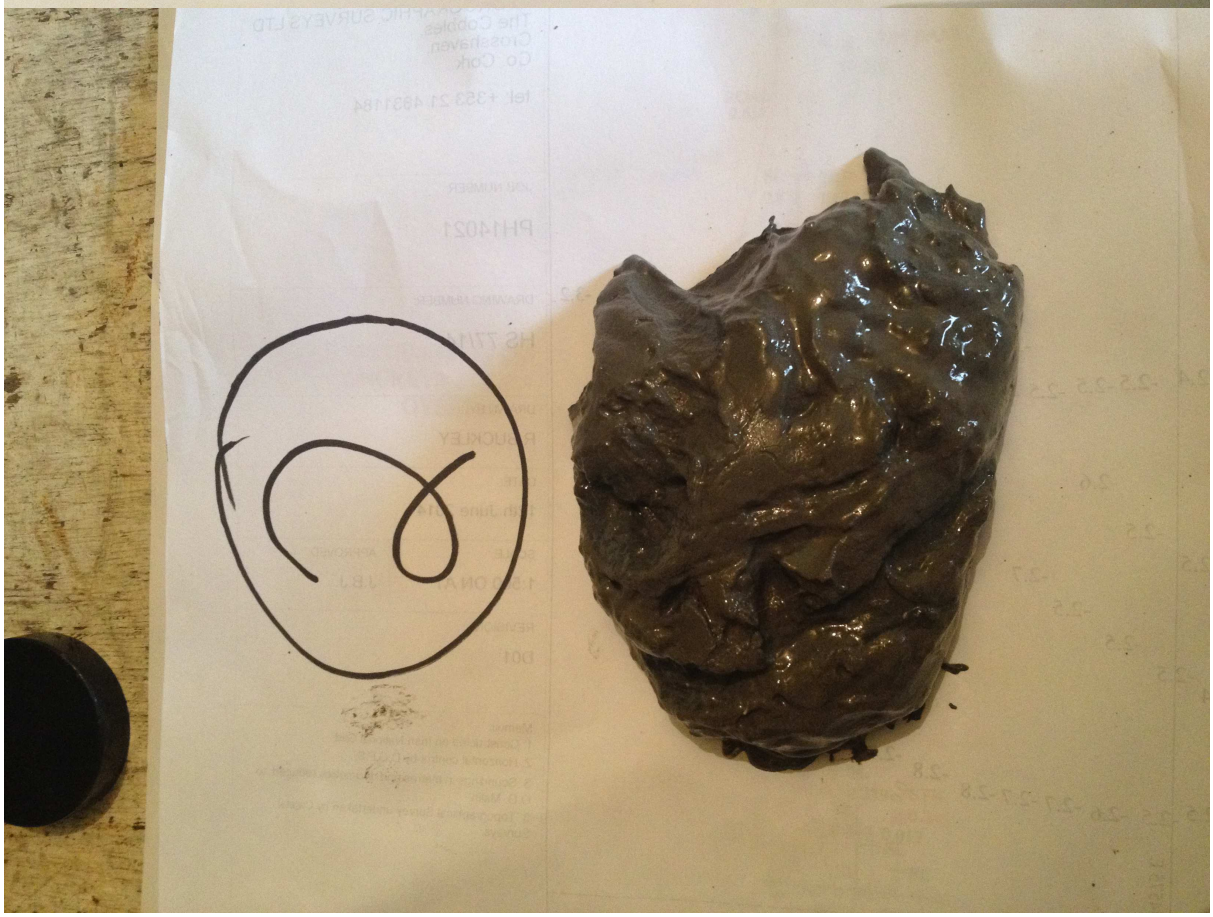

2

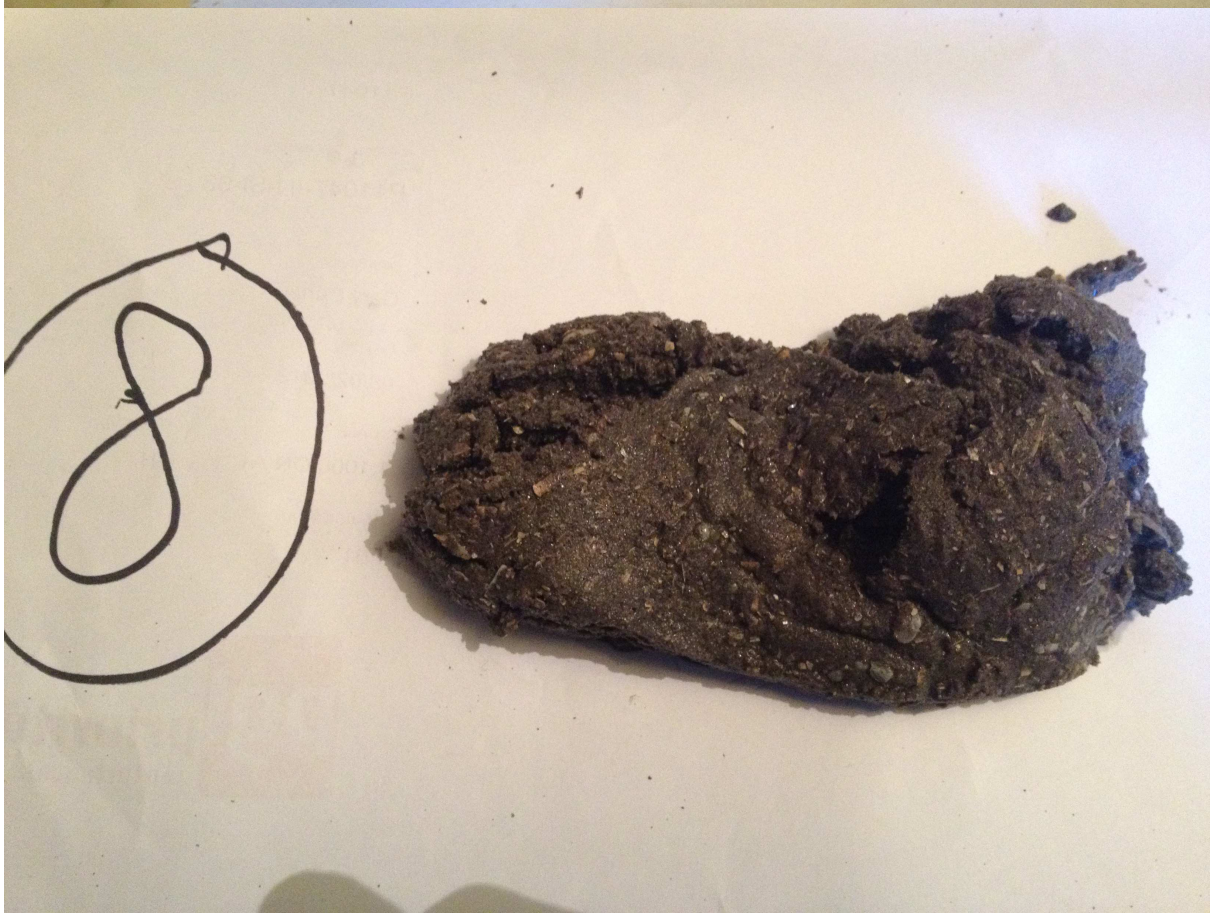

3


4


5


6


7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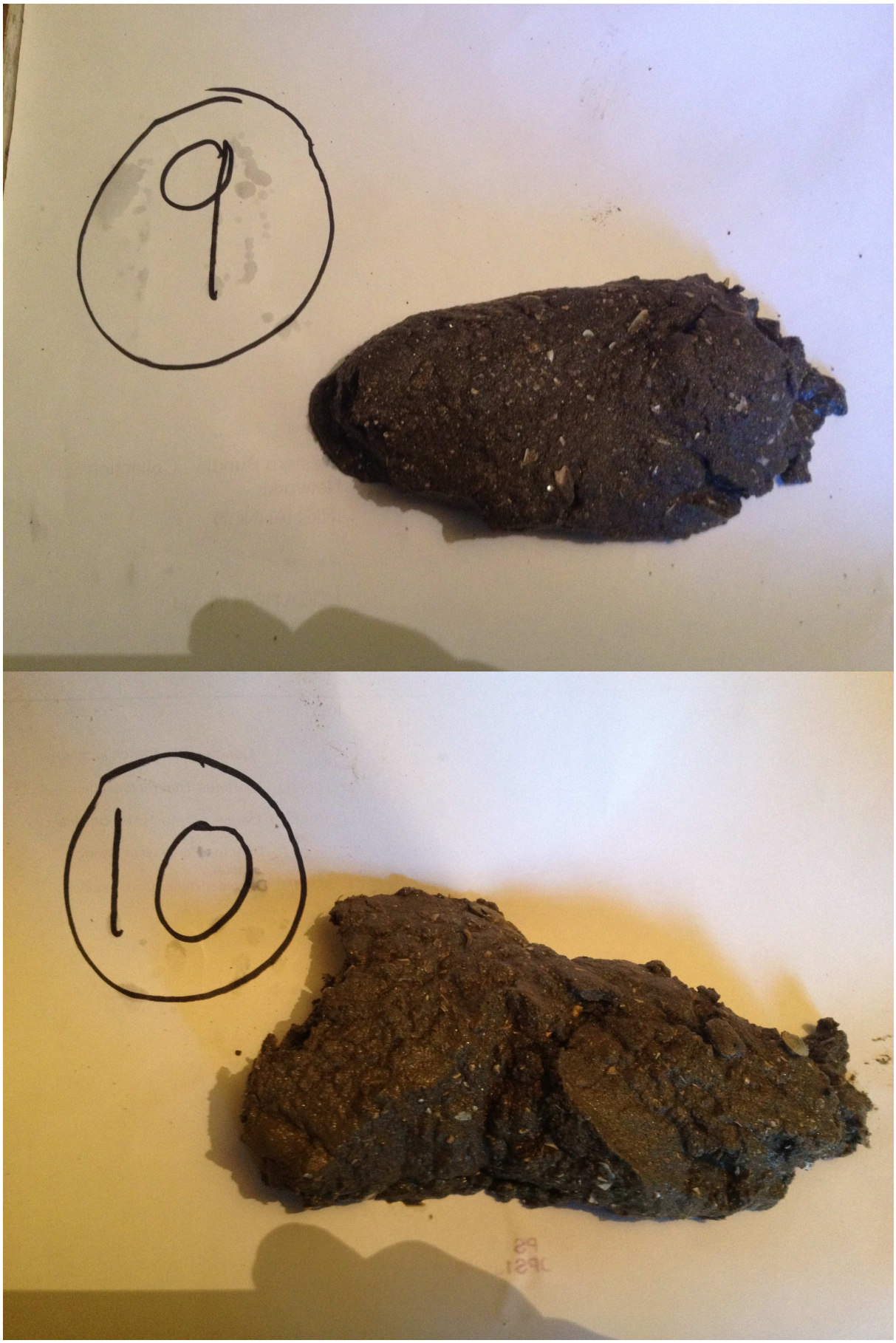
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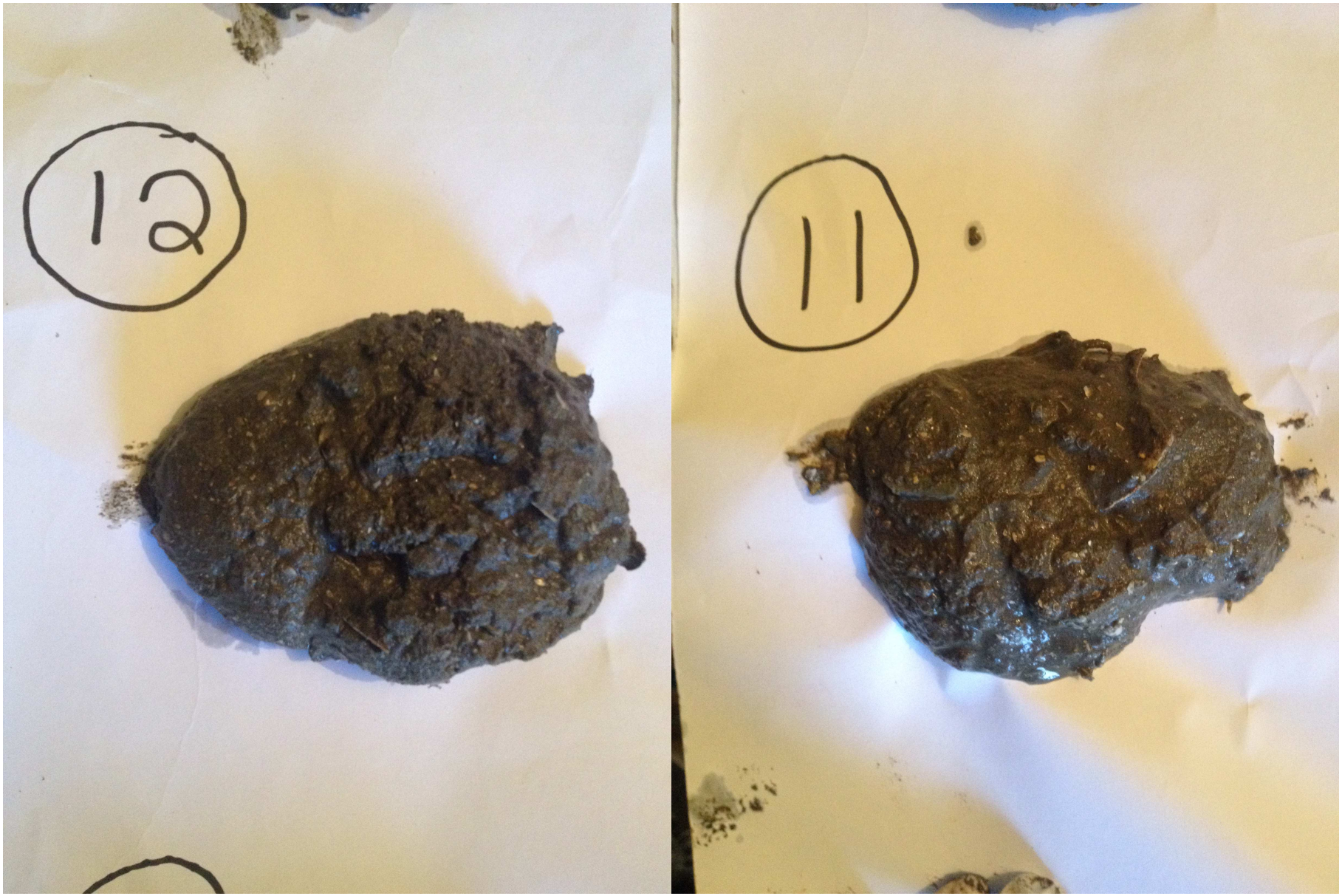
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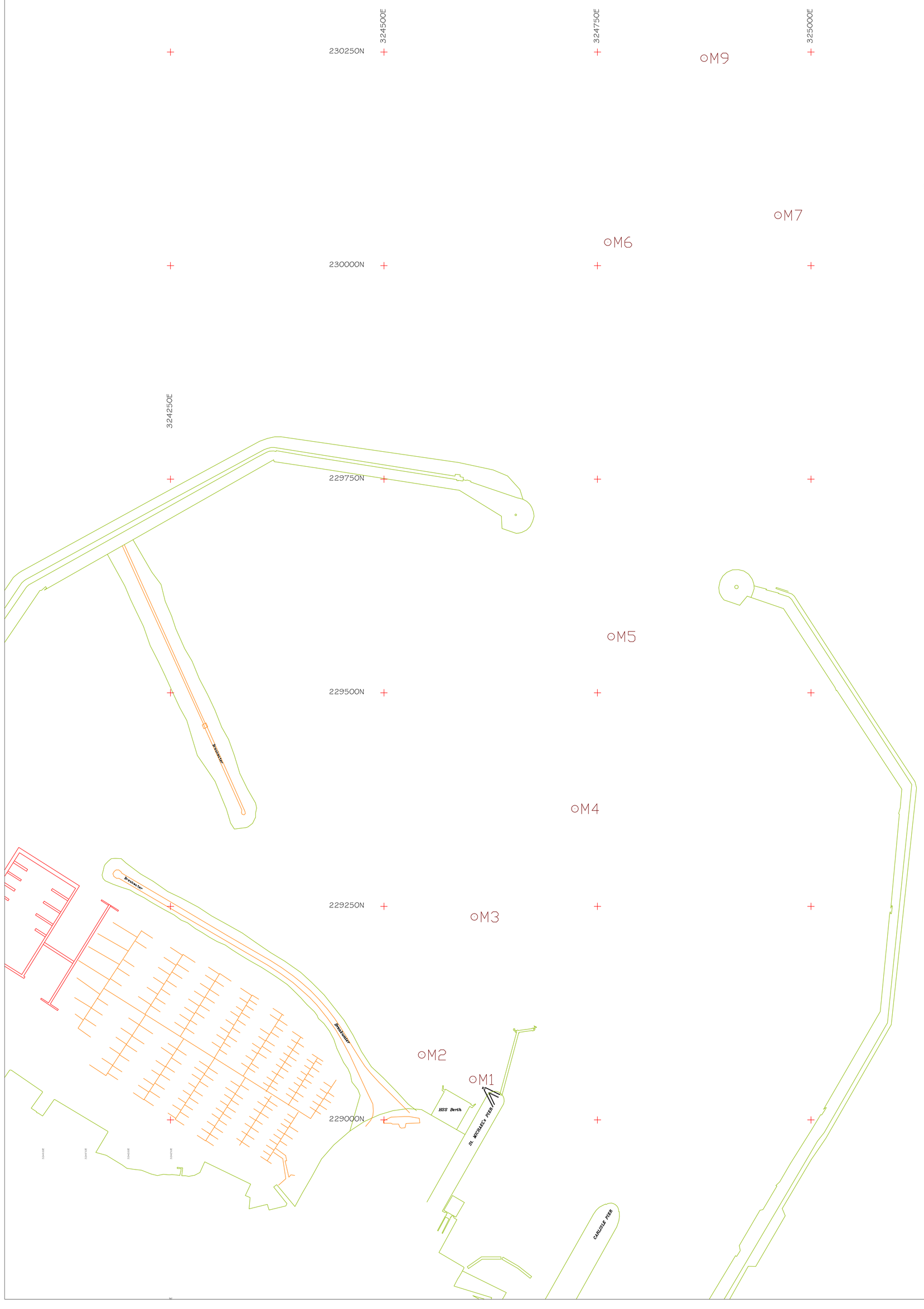
13

DRAWINGS

HS 24/15 Dun Laoghaire Sediment Sample Locations **Scale 1:2000**



SITE:

DUN LAOGHAIRE HARBOUR & APPROACHES

Sheet Title:

Sediment Sample Locations Dun Laoghaire Harbour

CLIENT:

Dun Laoghaire Harbour Company

SURVEYED BY:

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tel: +353 21 4831184

JOB NUMBER:

PH15009

DRAWING NUMBER:

HS 24/15

DRAWN BY:

James Coade

DATE:

26 January 2015

SCALE:	APPROVED:
1:2000 ON A0	J.B.J.

REVISION:

D01

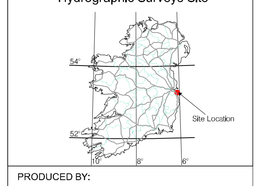
Memoir

1. Constructed on Irish National Grid.
2. Horizontal control by D.G.P.S.
3. Surface sediment sample locations shown thus:
○M1

CONSULTING ENGINEERS:

WATERMAN MOYLAN

Hydrographic Surveys Site



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