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Report of Survey

Dun Laoghaire Bathymetric Survey

Sediment Samples & Analysis

November 2013

Client:

Dun Laoghaire Harbour Company

Consulting Engineer:

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 Bathymetric Survey Sediment Samples & Analysis					
Report Name	Dun Laoghaire Bathymetric Survey Sediment Samples & Analysis Report					
Project Number	PH 13026					
This Report Comprises of	TOC	Text	No. of Volume	No. of Appendices	Drawings	Electronic data
	2	6	1	1	4	*.pdf, *.dwg, *.ags

Revision	Status	Author(s)	Approved By	Issue Date
D01	Draft			06.02.2014

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APPENDICES

DRAWINGS

1 INTRODUCTION

1.1 SITE LOCATION & DESCRIPTION

Hydrographic Surveys Ltd. were instructed by Waterman Moylan on behalf of Dun Laoghaire Harbour Company to undertake a combined bathymetric survey and sediment sampling at Dun Laoghaire Harbour. 10 representative sediment samples were acquired for analysis at NLS and an additional 2 samples for granulometry analysis.

Sediment Sampling and the bathymetric survey was undertaken in November 2013.

2 METHODOLOGY

2.1 HORIZONTAL CONTROL

Positioning was provided using a Trimble Ag 132 DGPS receiver interfaced with Hypack 2012A survey software. Co-ordinates were recorded for each sample. The recorded positions of the samples are shown on drawing no HS 109_4/_13

Sample numbers & positions (Irish National Grid coordinates)

Sediment Sample	Easting	Northing	Elevation m CD
S1	324893	230168	8.9
S2	325158	230025	10.0
S3	324783	229945	8.0
S4	324988	229848	9.7
S5	325224	229741	10.4
S6	324646	229640	6.1
S7	324890	229582	6.4
S8	324562	229472	5.7
S9	324480	229244	5.0
S10	324764	229234	6.8

2.2 SEDIMENT SAMPLING

The survey vessel was guided into position using Trimble dGPS interfaced with Hypack 2012A surveying software. The vessel was moored in position before launching the grab sampler from deck. Sea bed surface sediment samples were taken using a stainless steel Van Veen grab sampler. Once recovered the samples were immediately sealed in specialised 1kg sample pots and labelled.

The 10 final samples were sealed and dispatched by courier to the National Laboratory Service in the U.K. for analysis in November 2013. The laboratory began analysis on the samples on 5th December 2013. The analysis results were released on 23rd January 2014.

Two additional samples were taken at S4 and S8 and dispatched for granulometry analysis to Priority Geotechnical ltd.

2.3 VERTICAL DATUM

The bathymetric data was adjusted for tide. All levels were reduced to metres and decimetres below Chart datum. Tidal variations were recorded at Dun Laoghaire Pier using a Valeport 740 model vented tide gauge. Tidal height was recorded every 5 minutes for the duration of the survey. Tidal heights were recorded at an established TBM and levels reduced to Datum.

2.4 BATHYMETRIC SURVEY

The Odom Hydrotrac echo sounder was used, to record seabed levels in both digital and analogue format. The echo sounder has a resolution of 0.01m and was calibrated on site by the bar-check method. A bar check was undertaken prior to and on completion of the survey. The sounder was interfaced with the dGPS via Hypack 2012A survey software thereby providing a digital record with related position fixes.

3 RESULTS

3.1 BATHYMETRIC SURVEY

The results from the bathymetric survey are shown in drawings:
HS109-1/13, HS109-2/13 and HS109-3/13.

The area of bathymetric survey coverage was specified by the client. Data from Hydrographic Surveys' 2011 and 2012 bathymetric surveys were merged with the November 2013 survey to provide additional information in the area's not covered by the 2013 survey.

3.2 SEDIMENT SAMPLE RESULTS

The NLS sample analysis report (Report ID 20059856_1) for the ten 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 digital copy of the file "Dun Laoghaire Dredge sample Data.xls" is provided with this report.

Two samples S4 and S8 were sent for Granulometry analysis to Priority Geotechnical Ltd. The results from this grading are provided in Appendix 2.

APPENDIX 1

National Laboratory Service

Report ID 20059856_1

National Laboratory Service

Analytical Report

Final Report

Report ID - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660210

Sampled on: 29-Nov-13 @ 10:15

Comments: S1

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	<0.295	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	0.695	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	<0.4	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	97.1	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.720	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.820	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.550	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.460	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.200	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.130	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.0300	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with small shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
			NO_RESULT : Analyte not required				
Grain Size Inclusive Kurtosis	0.487	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.259	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	<-1	Unitless		-1	UKAS	SC	1368
Kurtosis	14.4	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	0.325	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.245	mm		0	UKAS	SC	1368
Sorting Coefficient	0.708	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	2.91	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	14.3	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	36.7	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	33.8	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.00	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	10.7	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.630	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	1.03	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	0.250	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	82.3	%	DC	0	None	SC	97
Solids at 105 C	82.3	%	DC	0	None	SC	97
Mercury : Dry Wt	0.00200	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	13300	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	6.39	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	<0.03	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	9.47	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	2.97	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	11.2	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	10.5	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	5.93	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	27.5	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	<2	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	<3	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	<5	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	<30	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	<3	ug/kg		3	UKAS	SC	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg	DC	3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<4	ug/kg	DC	3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.60	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	81.7	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment + shells

22.83g of the sample was taken for drying at <30degC which gave 19.05g 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 - 20059856 - 1

UKAS TESTING 0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660211

Sampled on: 29-Nov-13 @ 10:01

Comments: S2

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	<0.441	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	0.841	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	<0.4	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	93.1	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	1.08	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.160	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	1.62	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.760	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.840	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.520	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.890	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.350	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.440	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.230	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with shells and shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
			NO_RESULT : Analyte not required				
Grain Size Inclusive Kurtosis	0.278	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.288	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	<-1	Unitless		-1	UKAS	SC	1368
Kurtosis	14.3	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	0.707	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.245	mm		0	UKAS	SC	1368
Sorting Coefficient	1.19	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	6.89	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	16.7	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	32.5	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	28.9	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.00	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	11.2	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	1.29	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	2.54	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	2.23	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	82.8	%	DC	0	None	SC	97
Solids at 105 C	82.8	%	DC	0	None	SC	97
Mercury : Dry Wt	0.00200	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	14100	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	6.32	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.0460	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	11.3	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	3.34	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	11.9	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	13.6	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	6.09	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	30.1	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	<2	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	2.20	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	<3	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	<5	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	<30	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	<3	ug/kg		3	UKAS	SC	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Density	1.58	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	82.8	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment + shells

32.33g of the sample was taken for drying at <30degC which gave 27.13g 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 - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660212

Sampled on: 29-Nov-13 @ 10:22

Comments: S3

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	<1.41	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	1.81	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	<0.4	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	86.5	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	3.04	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	3.75	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	2.48	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	1.83	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	1.09	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.550	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.820	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with small shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
			NO_RESULT : Analyte not required				
Grain Size Inclusive Kurtosis	0.372	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.348	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	<-1	Unitless		-1	UKAS	SC	1368
Kurtosis	4.91	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	0.646	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.279	mm		0	UKAS	SC	1368
Sorting Coefficient	1.30	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	13.6	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	15.0	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	23.9	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	22.6	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.00	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	13.0	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	5.21	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.0400	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	2.72	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	4.06	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	3.47	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	75.5	%	DC	0	None	SC	97
Solids at 105 C	75.5	%	DC	0	None	SC	97
Mercury : Dry Wt	0.00400	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	15400	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	6.27	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.0390	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	14.5	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	3.71	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	12.9	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	12.0	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	6.37	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	31.8	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	<2	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	2.50	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	4.70	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	3.20	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	<5	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	<30	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	<3	ug/kg		3	UKAS	SC	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Density	1.84	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	77.0	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment + shells

14.93g of the sample was taken for drying at <30degC which gave 11.98g 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 - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660213

Sampled on: 29-Nov-13 @ 10:48

Comments: S4

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	<1.34	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	1.74	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	<0.4	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	79.0	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	3.73	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	5.32	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	3.68	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	4.10	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	1.90	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	1.08	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	1.17	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with shells and shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
NO_RESULT : Analyte not required							
Grain Size Inclusive Kurtosis	0.456	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.427	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	<-1	Unitless		-1	UKAS	SC	1368
Kurtosis	5.95	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	1.36	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.310	mm		0	UKAS	SC	1368
Sorting Coefficient	1.67	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	21.0	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	13.0	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	20.6	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.0400	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	19.8	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.170	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	12.2	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.190	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	5.79	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.0600	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.100	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	3.42	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	3.71	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	3.71	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	79.6	%	DC	0	None	SC	97
Solids at 105 C	79.6	%	DC	0	None	SC	97
Mercury : Dry Wt	0.00300	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	14300	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	5.01	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.0510	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	9.47	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	3.37	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	11.3	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	13.8	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	5.09	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	26.0	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	<2	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	6.20	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	5.00	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	6.90	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	<5	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	10.9	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	<30	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	14.7	ug/kg		3	UKAS	SC	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Density	1.42	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	83.1	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment + shells

16.62g of the sample was taken for drying at <30degC which gave 14.17g 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 - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660214

Sampled on: 29-Nov-13 @ 09:41

Comments: S5

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	<0.424	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	0.824	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	<0.4	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	79.4	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	1.97	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	4.77	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	5.60	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	3.45	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	1.14	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	2.10	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	1.58	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with shells and shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
			NO_RESULT : Analyte not required				
Grain Size Inclusive Kurtosis	0.336	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.364	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	-0.599	Unitless		-1	UKAS	SC	1368
Kurtosis	5.46	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	1.20	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.265	mm		0	UKAS	SC	1368
Sorting Coefficient	1.85	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	20.6	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.110	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.150	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	15.4	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.300	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	24.0	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.260	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.550	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	20.6	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.360	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.280	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	9.61	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.360	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	2.35	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.110	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.240	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.350	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	4.36	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	35.6	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	76.5	%	DC	0	None	SC	97
Solids at 105 C	76.5	%	DC	0	None	SC	97
Mercury : Dry Wt	0.00400	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	14500	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	4.88	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.0570	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	13.8	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	6.63	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	14.0	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	13.8	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	14.4	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	442	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	<2	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	<2	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	2.40	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	5.90	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	5.90	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	10.2	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	8.40	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	<5	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	7.40	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	<30	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	<10	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	7.60	ug/kg		*3*	UKAS	SC	1051
PCB - 028 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 153 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	*DC*	*3*	UKAS	LE	897
Density	1.78	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	82.0	%		*0.5*	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment + shells

17.17g of the sample was taken for drying at <30degC which gave 14.46g 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 - 20059856 - 1

UKAS TESTING 0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660215

Sampled on: 29-Nov-13 @ 11:55

Comments: S6

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	4.59	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	6.76	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	2.17	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	15.7	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	5.85	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	3.31	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	12.8	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	3.17	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	18.5	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	18.7	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	1.41	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	9.67	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	2.01	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	5.58	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	3.42	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with shells and shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
			NO_RESULT : Analyte not required				
Grain Size Inclusive Kurtosis	0.298	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	2.43	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	0.579	Unitless		-1	UKAS	SC	1368
Kurtosis	4.73	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	5.27	mm		0	UKAS	SC	1368
Particle Diameter : Median	2.66	mm		0	UKAS	SC	1368
Sorting Coefficient	1.87	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	84.3	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.0100	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.0500	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	2.31	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.0700	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	3.16	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.0400	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.110	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	2.97	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.0500	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	0.100	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	2.16	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	0.0700	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.0600	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	1.67	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	0.260	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.0600	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	1.50	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	1.05	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	33.7	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	66.3	%	DC	0	None	SC	97
Solids at 105 C	66.3	%	DC	0	None	SC	97
Mercury : Dry Wt	0.0100	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	10500	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	2.57	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.0440	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	12.6	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	6.34	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	12.8	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	14.3	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	6.15	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	24.2	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
DDE -pp : Dry Wt	NoResult	ug/kg		2	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
DDT -op : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
DDT -pp : Dry Wt	NoResult	ug/kg		2	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
Dieldrin : Dry Wt	NoResult	ug/kg		3	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
Endrin : Dry Wt	NoResult	ug/kg		2	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
HCH -alpha : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
HCH -beta : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
HCH -delta : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
HCH -gamma : Dry Wt :- {Lindane}	NoResult	ug/kg		2	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
Hexachlorobenzene : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
Hexachlorobutadiene : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
Isodrin : Dry Wt	NoResult	ug/kg		2	UKAS	SC	672
			NO_RESULT : Unsuitable sample				
TDE - pp : Dry Wt	NoResult	ug/kg		1	UKAS	SC	672
			NO_RESULT : Unsuitable sample				

Acenaphthene : Dry Wt	NoResult	ug/kg		2	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Acenaphthylene : Dry Wt	NoResult	ug/kg		2	None	SC	1051
	NO_RESULT : Unsuitable sample						
Anthracene : Dry Wt	NoResult	ug/kg		2	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Benzo(a)anthracene : Dry Wt	NoResult	ug/kg		2	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Benzo(a)pyrene : Dry Wt	NoResult	ug/kg		2	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Benzo(b)fluoranthene : Dry Wt	NoResult	ug/kg		10	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Benzo(ghi)perylene : Dry Wt	NoResult	ug/kg		10	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Benzo(k)fluoranthene : Dry Wt	NoResult	ug/kg		10	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Chrysene + Triphenylene : Dry Wt	NoResult	ug/kg		3	None	SC	1051
	NO_RESULT : Unsuitable sample						
Dibenzo(ah)anthracene : Dry Wt	NoResult	ug/kg		5	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Fluoranthene : Dry Wt	NoResult	ug/kg		2	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Fluorene : Dry Wt	NoResult	ug/kg		10	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Indeno(1,2,3-c,d)pyrene : Dry Wt	NoResult	ug/kg		10	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Naphthalene : Dry Wt	NoResult	ug/kg		30	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Phenanthrene : Dry Wt	NoResult	ug/kg		10	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
Pyrene : Dry Wt	NoResult	ug/kg		3	UKAS	SC	1051
	NO_RESULT : Unsuitable sample						
PCB - 028 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<3	ug/kg	DC	3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<3	ug/kg	DC	3	UKAS	LE	897
Density	1.17	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	83.5	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be medium brown sandy sediment + shells

14.47g of the sample was taken for drying at <30degC which gave 12.43g 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 - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660216

Sampled on: 29-Nov-13 @ 11:30

Comments: S7

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	2.32	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	3.37	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	1.05	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0200	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0200	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.0400	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.0400	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with small shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
			NO_RESULT : Analyte not required				
Grain Size Inclusive Kurtosis	0.593	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.0260	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	0.259	Unitless		-1	UKAS	SC	1368
Kurtosis	2.04	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	0.0800	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.0330	mm		0	UKAS	SC	1368
Sorting Coefficient	2.39	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	3.17	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.110	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.59	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.27	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.50	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.66	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	9.95	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	4.96	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	6.69	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.88	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	4.55	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	3.10	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	5.92	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	4.72	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.04	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	6.00	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	6.48	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.290	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	8.38	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	6.31	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	10.4	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	140	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	64.1	%	DC	0	None	SC	97
Solids at 105 C	64.1	%	DC	0	None	SC	97
Mercury : Dry Wt	0.0250	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	47600	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	8.70	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.483	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	104	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	34.4	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	38.7	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	43.9	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	54.8	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	107	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	12.2	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	29.3	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	51.2	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	118	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	124	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	121	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	86.5	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	56.0	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	120	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	20.2	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	216	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	38.2	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	101	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	58.8	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	209	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	231	ug/kg		3	UKAS	SC	1051
PCB - 028 : Dry Wt	0.280	ug/kg	DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	0.120	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	0.160	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	0.120	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<5	ug/kg ELEVATED_MRV : Dry weight calculation	DC	3	UKAS	LE	897
Density	1.69	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	64.5	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be dark brown clay sediment

9.94g of the sample was taken for drying at <30degC which gave 7.17g 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 - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660217

Sampled on: 29-Nov-13 @ 12:00

Comments: S8

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	2.23	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	3.19	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	0.958	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0100	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0100	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0100	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.0900	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with a small stone and small shell fragments							
Raw Data Report	Report	Text		0	None	SC	1369
NO_RESULT : Analyte not required							
Grain Size Inclusive Kurtosis	0.437	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.0580	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	1.14	Unitless		-1	UKAS	SC	1368
Kurtosis	3.45	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	0.122	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.100	mm		0	UKAS	SC	1368
Sorting Coefficient	2.17	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	1.89	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.120	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.940	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.31	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	1.96	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	2.81	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	18.9	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	2.59	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	12.7	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	2.59	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	2.12	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	5.30	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	2.94	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	2.18	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	1.29	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	4.90	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	3.04	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.280	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	11.3	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	2.94	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	17.9	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	89.9	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	76.1	%	DC	0	None	SC	97
Solids at 105 C	76.1	%	DC	0	None	SC	97
Mercury : Dry Wt	0.0740	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	42900	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	8.05	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.203	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	84.4	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	31.1	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	32.7	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	38.0	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	40.0	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	94.2	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	8.60	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	10.5	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	32.3	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	77.0	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	84.2	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	91.6	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	59.4	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	45.9	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	86.3	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	15.4	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	159	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	20.4	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	69.2	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	52.5	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	106	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	166	ug/kg		*3*	UKAS	SC	1051
PCB - 028 : Dry Wt	0.280	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 153 : Dry Wt	0.120	ug/kg	*DC*	*0.1*	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	*DC*	*0.1*	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	*DC*	*3*	UKAS	LE	897
Tributyl Tin : Dry Wt as Cation	<4	ug/kg ELEVATED_MRV : Dry weight calculation	*DC*	*3*	UKAS	LE	897
Density	1.69	g/ml		*0.1*	None	LE	881
Dry Solids @ 30°C	79.3	%		*0.5*	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be dark brown sandy clay sediment

19.55g of the sample was taken for drying at <30degC which gave 15.94g 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 - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660218

Sampled on: 29-Nov-13 @ 12:30

Comments: S9

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	2.22	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	3.54	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	1.32	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	99.9	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.100	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with one stone							
Raw Data Report	Report	Text		0	None	SC	1369
			NO_RESULT : Analyte not required				
Grain Size Inclusive Kurtosis	0.545	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.0170	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	-0.117	Unitless		-1	UKAS	SC	1368
Kurtosis	2.78	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	0.0500	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.0160	mm		0	UKAS	SC	1368
Sorting Coefficient	1.98	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	2.43	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.100	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.25	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	1.92	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.44	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	8.62	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	2.89	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	7.74	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	1.30	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	5.57	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	7.60	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	0.820	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	7.69	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	8.01	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.800	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	8.20	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	9.25	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.310	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	7.32	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	9.47	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	5.27	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	128	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	54.7	%	DC	0	None	SC	97
Solids at 105 C	54.7	%	DC	0	None	SC	97
Mercury : Dry Wt	0.0770	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	51700	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	9.89	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.164	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	107	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	35.5	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	38.7	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	48.8	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	60.2	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	114	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	4.60	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	11.2	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	23.9	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	89.5	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	83.2	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	101	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	68.4	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	53.1	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	101	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	16.0	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	132	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	18.5	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	82.7	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	49.1	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	74.8	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	118	ug/kg		3	UKAS	SC	1051
PCB - 028 : Dry Wt	0.280	ug/kg	DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	0.200	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg	DC	3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<4	ug/kg	DC	3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.52	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	67.4	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be dark brown clay sediment

16.49g of the sample was taken for drying at <30degC which gave 11.81g 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 - 20059856 - 1

UKAS TESTING 0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660219

Sampled on: 29-Nov-13 @ 12:10

Comments: S10

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	2.04	%	DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%			None	NLS	864
Carbon : Dry Wt	3.46	%	DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	1.42	%	DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	99.5	%		0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.0400	%		0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.0800	%		0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.0600	%		0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.0800	%		0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.0600	%		0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.0900	%		0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.0100	%		0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%		0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.0600	%		0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.0200	%		0	None	SC	1369
Particle Size Report	Report	Text			None	SC	1369
Silty sand with shell fragments and plastic							
Raw Data Report	Report	Text		0	None	SC	1369
NO_RESULT : Analyte not required							
Grain Size Inclusive Kurtosis	0.601	mm		-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.0260	mm		0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	0.127	Unitless		-1	UKAS	SC	1368
Kurtosis	2.28	Unitless		-12	UKAS	SC	1368
Particle Diameter : Mean	0.108	mm		0	UKAS	SC	1368
Particle Diameter : Median	0.0300	mm		0	UKAS	SC	1368
Sorting Coefficient	2.44	Unitless		-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	3.20	%		0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.500	%		0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	1.59	%		0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	2.25	%		0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	3.51	%		0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	5.90	%		0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	10.6	%		0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	5.18	%		0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	7.82	%		0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	4.96	%		0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	4.70	%		0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	3.48	%		0	UKAS	SC	1370
Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	6.11	%		0	UKAS	SC	1370

Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	4.53	%		0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	0.510	%		0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.11	%		0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	6.75	%		0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	7.06	%		0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	6.59	%		0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%		0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	9.70	%		0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	110	mg/kg	DC	0.05	UKAS	SC	402
Dry Matter : %	58.4	%	DC	0	None	SC	97
Solids at 105 C	58.4	%	DC	0	None	SC	97
Mercury : Dry Wt	0.0500	mg/kg		0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	48800	mg/kg		50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	9.38	mg/kg		0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.170	mg/kg		0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	103	mg/kg		3	UKAS	SC	341
Copper, HF Digest : Dry Wt	55.9	mg/kg		1	UKAS	SC	341
Lead, HF Digest : Dry Wt	36.8	mg/kg		3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	46.3	mg/kg		0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	55.0	mg/kg		1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	116	mg/kg		5	UKAS	SC	341
Aldrin : Dry Wt	<1	ug/kg		1	UKAS	SC	672
DDE -pp : Dry Wt	<2	ug/kg		2	UKAS	SC	672
DDT -op : Dry Wt	1.32	ug/kg		1	UKAS	SC	672
DDT -pp : Dry Wt	5.59	ug/kg		2	UKAS	SC	672
Dieldrin : Dry Wt	<3	ug/kg		3	UKAS	SC	672
Endrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
HCH -alpha : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -beta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -delta : Dry Wt	<1	ug/kg		1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	<2	ug/kg		2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	<1	ug/kg		1	UKAS	SC	672
Isodrin : Dry Wt	<2	ug/kg		2	UKAS	SC	672
TDE - pp : Dry Wt	25.5	ug/kg		1	UKAS	SC	672
Acenaphthene : Dry Wt	5.40	ug/kg		2	UKAS	SC	1051
Acenaphthylene : Dry Wt	9.40	ug/kg		2	None	SC	1051
Anthracene : Dry Wt	13.6	ug/kg		2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	46.2	ug/kg		2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	51.4	ug/kg		2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	71.9	ug/kg		10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	49.9	ug/kg		10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	32.7	ug/kg		10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	60.4	ug/kg		3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	11.1	ug/kg		5	UKAS	SC	1051
Fluoranthene : Dry Wt	75.2	ug/kg		2	UKAS	SC	1051
Fluorene : Dry Wt	15.9	ug/kg		10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	61.2	ug/kg		10	UKAS	SC	1051
Naphthalene : Dry Wt	53.2	ug/kg		30	UKAS	SC	1051
Phenanthrene : Dry Wt	55.0	ug/kg		10	UKAS	SC	1051

Pyrene : Dry Wt	75.6	ug/kg		3	UKAS	SC	1051
PCB - 028 : Dry Wt	<0.2	ug/kg	DC	0.1	UKAS	SC	685
		ELEVATED_MRV : Matrix interference					
PCB - 052 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	<0.1	ug/kg	DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	<4	ug/kg	DC	3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Tributyl Tin : Dry Wt as Cation	<4	ug/kg	DC	3	UKAS	LE	897
		ELEVATED_MRV : Dry weight calculation					
Density	1.51	g/ml		0.1	None	LE	881
Dry Solids @ 30°C	72.6	%		0.5	None	LE	1130
Accreditation Assessment	2	No.			None	LE	924
Sample Preparation	Report	Text			None	LE	924

The sample appeared to be dark brown clay sediment

16.58g of the sample was taken for drying at <30degC which gave 12.62g 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 - 20059856 - 1

0754

Batch description: Dun Laoghaire Sediment Analysis

Reported on: 23-Jan-2014

Client: Hydrographic Surveys Ltd

Project: Dun Laoghaire Sediment Analysis

Sample Point Name: CC Hydrographic Surveys Ltd

Folder No: 002660220

Sampled on: Date Not Supplied

Comments: CRM

Quote No: 10721

Matrix: Sediment

Analyte	Result	Units	Flag	MRV	Accred	Lab ID	Testcode
Carbonate as C : Dry Wt	0.00400	%	DA, DC		None	NLS	864
Moisture Content, Air dried 105 C	NoResult	%	DA		None	NLS	864
Carbon : Dry Wt	0.529	%	DA, DC	0.4	UKAS	SC	404
Carbon, Organic : Dry Wt as C	0.525	%	DA, DC	0.4	UKAS	SC	404
Grain Size Fraction : <1000 microns : {>0 phi}	100	%	DA	0	None	SC	1369
Grain Size Fraction : > 63000 microns : {< -6.0 phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 1000 to 1400 mic : {0 to -0.5phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 11200 to 16000 mic : {-3.5 to -4.0phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 1400 to 2000 mic : {-0.5 to -1.0phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 16000 to 22400 mic : {-4.0 to -4.5phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 2000 to 2800 mic : {-1.0 to -1.5phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 22400 to 31500 mic : {-4.5 to -5.0phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 2800 to 4000 mic : {-1.5 to -2.0phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 31500 to 45000 mic : {-5.0 to -5.5phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 4000 to 5600 mic : {-2.0 to -2.5phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 45000 to 63000 mic : {-5.5 to -6.0phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 5600 to 8000 mic : {-2.5 to -3.0phi}	0.00	%	DA	0	None	SC	1369
Grain Size Fraction : 8000 to 11200 mic : {-3.0 to -3.5phi}	0.00	%	DA	0	None	SC	1369
Particle Size Report CRM	Report	Text	DA		None	SC	1369
Raw Data Report Not required.	Report	Text	DA		None	SC	1369
Grain Size Inclusive Kurtosis	0.518	mm	DA	-12	UKAS	SC	1368
Grain Size Inclusive Mean	0.138	mm	DA	0	UKAS	SC	1368
Inclusive Graphic Skewness :- {SKI}	0.149	Unitless	DA	-1	UKAS	SC	1368
Kurtosis	2.53	Unitless	DA	-12	UKAS	SC	1368
Particle Diameter : Mean	0.160	mm	DA	0	UKAS	SC	1368
Particle Diameter : Median	0.140	mm	DA	0	UKAS	SC	1368
Sorting Coefficient	0.755	Unitless	DA	-3	UKAS	SC	1368
Grain Size Fraction : < 0.98 microns : {>10 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : >1000 microns : {<0 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 0.98 to 1.38 microns : {10 to 9.5 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 1.38 to 1.95 microns : {9.5 to 9 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 1.95 to 2.76 microns : {9 to 8.5 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 11.1 to 15.6 microns : {6.5 to 6 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 125 to 177 microns : {3 to 2.5 phi}	24.7	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 15.6 to 22.1 microns : {6 to 5.5 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 177 to 250 microns : {2.5 to 2 phi}	20.4	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 2.76 to 3.91 microns : {8.5 to 8 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 22.1 to 31.3 microns : {5.5 to 5 phi}	0.0200	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 250 to 354 microns : {2 to 1.5 phi}	10.8	%	DA	0	UKAS	SC	1370

Grain Size Fraction : 3.91 to 5.52 microns : {8 to 7.5 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 31.3 to 44.2 microns : {5 to 4.5 phi}	1.27	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 354 to 500 microns : {1.5 to 1 phi}	2.25	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 44.2 to 62.5 microns : {4.5 to 4 phi}	5.89	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 5.52 to 7.81 microns : {7.5 to 7 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 500 to 707 microns : {1 to 0.5 phi}	0.0100	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 62.5 to 88.4 microns : {4 to 3.5 phi}	13.4	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 7.81 to 11.1 microns : {7 to 6.5 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 707 to 1000 microns : {0.5 to 0 phi}	0.00	%	DA	0	UKAS	SC	1370
Grain Size Fraction : 88.4 to 125 microns : {3.5 to 3 phi}	21.2	%	DA	0	UKAS	SC	1370
Hydrocarbons : Total : Dry Wt as Ekofisk	1.39	mg/kg	DA, DC	0.05	UKAS	SC	402
Dry Matter : %	NoResult	%	DA, DC	0	None	SC	97
			NO_RESULT : Analyte not applicable				
Solids at 105 C	NoResult	%	DA, DC	0	None	SC	97
			NO_RESULT : Analyte not applicable				
Mercury : Dry Wt	0.0851	mg/kg	DA	0.002	UKAS	SC	1082
Aluminium, HF Digest : Dry Wt	85800	mg/kg	DA	50	UKAS	SC	756
Arsenic, HF Digest : Dry Wt	20.4	mg/kg	DA	0.4	UKAS	SC	341
Cadmium, HF Digest : Dry Wt	0.217	mg/kg	DA	0.03	UKAS	SC	341
Chromium, HF Digest : Dry Wt	85.7	mg/kg	DA	3	UKAS	SC	341
Copper, HF Digest : Dry Wt	36.6	mg/kg	DA	1	UKAS	SC	341
Lead, HF Digest : Dry Wt	24.0	mg/kg	DA	3	UKAS	SC	341
Lithium, HF Digest : Dry Wt	66.7	mg/kg	DA	0.1	UKAS	SC	341
Nickel, HF Digest : Dry Wt	43.2	mg/kg	DA	1	UKAS	SC	341
Zinc : HF Digest : Dry Wt	155	mg/kg	DA	5	UKAS	SC	341
Aldrin : Dry Wt	20.2	ug/kg	DA	1	UKAS	SC	672
DDE -pp : Dry Wt	20.1	ug/kg	DA	2	UKAS	SC	672
DDT -op : Dry Wt	20.4	ug/kg	DA	1	UKAS	SC	672
DDT -pp : Dry Wt	19.7	ug/kg	DA	2	UKAS	SC	672
Dieldrin : Dry Wt	23.0	ug/kg	DA	3	UKAS	SC	672
Endrin : Dry Wt	20.2	ug/kg	DA	2	UKAS	SC	672
HCH -alpha : Dry Wt	19.6	ug/kg	DA	1	UKAS	SC	672
HCH -beta : Dry Wt	20.6	ug/kg	DA	1	UKAS	SC	672
HCH -delta : Dry Wt	19.1	ug/kg	DA	1	UKAS	SC	672
HCH -gamma : Dry Wt :- {Lindane}	20.3	ug/kg	DA	2	UKAS	SC	672
Hexachlorobenzene : Dry Wt	24.8	ug/kg	DA	1	UKAS	SC	672
Hexachlorobutadiene : Dry Wt	21.9	ug/kg	DA	1	UKAS	SC	672
Isodrin : Dry Wt	19.6	ug/kg	DA	2	UKAS	SC	672
TDE - pp : Dry Wt	24.5	ug/kg	DA	1	UKAS	SC	672
Acenaphthene : Dry Wt	30.9	ug/kg	DA, DC	2	UKAS	SC	1051
Acenaphthylene : Dry Wt	82.1	ug/kg	DA, DC	2	None	SC	1051
Anthracene : Dry Wt	168	ug/kg	DA, DC	2	UKAS	SC	1051
Benzo(a)anthracene : Dry Wt	316	ug/kg	DA, DC	2	UKAS	SC	1051
Benzo(a)pyrene : Dry Wt	280	ug/kg	DA, DC	2	UKAS	SC	1051
Benzo(b)fluoranthene : Dry Wt	444	ug/kg	DA, DC	10	UKAS	SC	1051
Benzo(ghi)perylene : Dry Wt	282	ug/kg	DA, DC	10	UKAS	SC	1051
Benzo(k)fluoranthene : Dry Wt	236	ug/kg	DA, DC	10	UKAS	SC	1051
Chrysene + Triphenylene : Dry Wt	429	ug/kg	DA, DC	3	None	SC	1051
Dibenzo(ah)anthracene : Dry Wt	67.6	ug/kg	DA, DC	5	UKAS	SC	1051
Fluoranthene : Dry Wt	604	ug/kg	DA, DC	2	UKAS	SC	1051

Fluorene : Dry Wt	55.6	ug/kg	DA, DC	10	UKAS	SC	1051
Indeno(1,2,3-c,d)pyrene : Dry Wt	320	ug/kg	DA, DC	10	UKAS	SC	1051
Naphthalene : Dry Wt	880	ug/kg	DA, DC	30	UKAS	SC	1051
Phenanthrene : Dry Wt	415	ug/kg	DA, DC	10	UKAS	SC	1051
Pyrene : Dry Wt	489	ug/kg	DA, DC	3	UKAS	SC	1051
PCB - 028 : Dry Wt	4.16	ug/kg	DA, DC	0.1	UKAS	SC	685
PCB - 052 : Dry Wt	5.20	ug/kg	DA, DC	0.1	UKAS	SC	685
PCB - 101 : Dry Wt	5.12	ug/kg	DA, DC	0.1	UKAS	SC	685
PCB - 118 : Dry Wt	4.00	ug/kg	DA, DC	0.1	UKAS	SC	685
PCB - 138 : Dry Wt	3.52	ug/kg	DA, DC	0.1	UKAS	SC	685
PCB - 153 : Dry Wt	5.28	ug/kg	DA, DC	0.1	UKAS	SC	685
PCB - 180 : Dry Wt	3.52	ug/kg	DA, DC	0.1	UKAS	SC	685
Dibutyl Tin : Dry Wt as Cation	NoResult	ug/kg	DA	3	UKAS	LE	897
			NO_RESULT : Analyte not required				
Tributyl Tin : Dry Wt as Cation	NoResult	ug/kg	DA	3	UKAS	LE	897
			NO_RESULT : Analyte not required				
Density	NoResult	g/ml	DA	0.1	None	LE	881
			NO_RESULT : Unsuitable sample				
Dry Solids @ 30°C	NoResult	%	DA	0.5	None	LE	1130
			NO_RESULT : Analyte not applicable				
Accreditation Assessment	NoResult	No.	DA	1	None	LE	924
			NO_RESULT : Analyte not required				
Sample Preparation	Report	Text	DA		None	LE	924
			NO_RESULT : Analyte not required				

National Laboratory Service

Analytical Report

Final Report

Report ID - 20059856 - 1

Batch description: Dun Laoghaire Sediment Analysis

UKAS TESTING 0754

Reported on: 23-Jan-2014

Method Description Summary for all samples in batch Number 20059856

97	LL ME 11.9 LOI - Moisture, Loss on Ignition - determined by gravimetry at specific temperature; from "as received" sample
341	LL ME ICPMS 12.1 & 12.4 - Metals - HF Digest Open Vessel Hotplate Digest, determined by ICPMS, sieved to <63um
402	NLS I UVF 10.2 - HCs - methanol digested; pentane xch; by UV fluorescence spectrometry
404	LL I CHN 11.2 & 11.3 - combusted; determined by TCD; Organic C - acid pretreated to remove inorganic carbonates
672	LL O PESTICIDES - solvent extracted; determined by GCMS (SIM), larger particles manually removed prior to analysis.
685	LL O PCBs - solvent extracted; determined by GCMS (SIM), larger particles manually removed prior to analysis.
756	LL ME ICPOES 22.1 & 22.2 - Metals - Open Vessel Hotplate HF digest, determined by ICPOES, sieved to <63um
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
924	Sample Preparation; Dry Solids (30°C); from "as received" sample
1051	LL O PAHs - solvent extracted; determined by GCMS (EI), larger particles manually removed prior to analysis.
1082	LL ME Hg 10.8 - Mercury - microwave aqua regia digested; acidic SnCl2 reduced; determined by CV-AFS, sieved to <63um.
1130	LE P Soil Preparation 01: The sample is air-dried at <30ºC in a controlled environment until a constant weight it achieved.
1368	NLS I Particle Size Laser - various parameters calculated from the band sizes produced by laser beam diffraction technique
1369	NLS I Particle Size Sieve - various band sizes >1000mm - determined by manual sieving.
1370	NLS I Particle Size Laser - various band sizes <1000mm - determined by laser beam diffraction instrumentation.

David Gazzard

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 **00:00:00**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

Priority Geotechnical Ltd

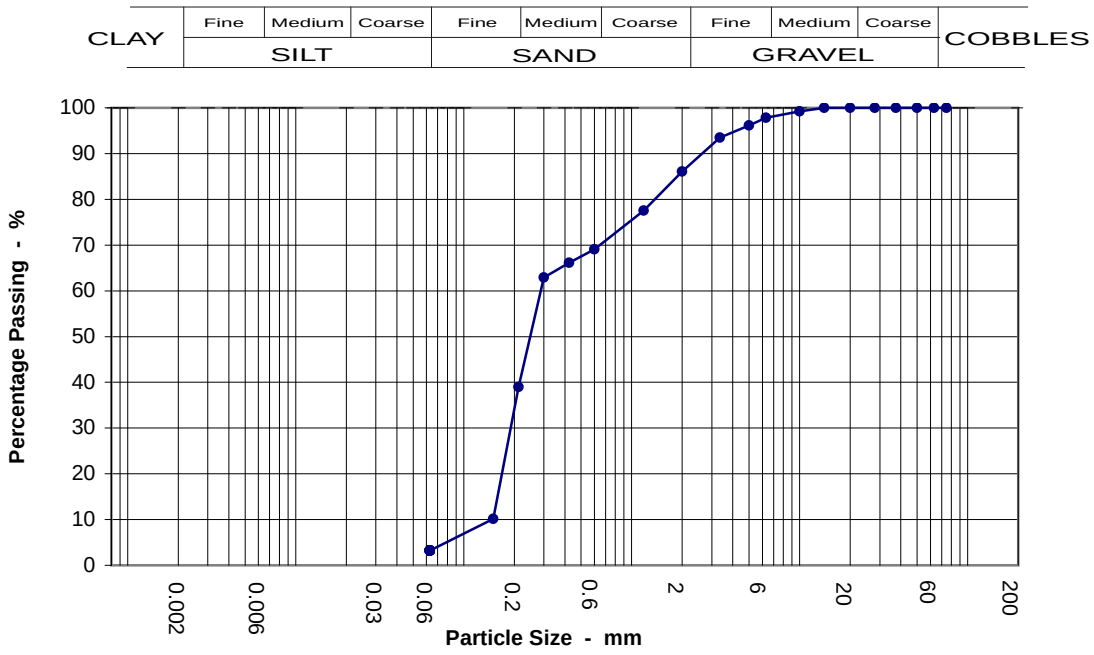
Granulometry Results (S4, S8)

PRIORITY GEOTECHNICAL

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**P13**
		Borehole / Pit No	S4
Location	**Dun Laoghaire**	Sample No	0
		Depth	0.00 m
Soil Description		Sample type	BLK



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	98		
5	96		
3.35	94		
2	86		
1.18	78		
0.6	69		
0.425	66		
0.3	63		
0.212	39		
0.15	10		
0.063	3		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	N/A

Sample Proportions	
Cobbles	0.0
Gravel	14.0
Sand	82.8
Silt & Clay	3.2

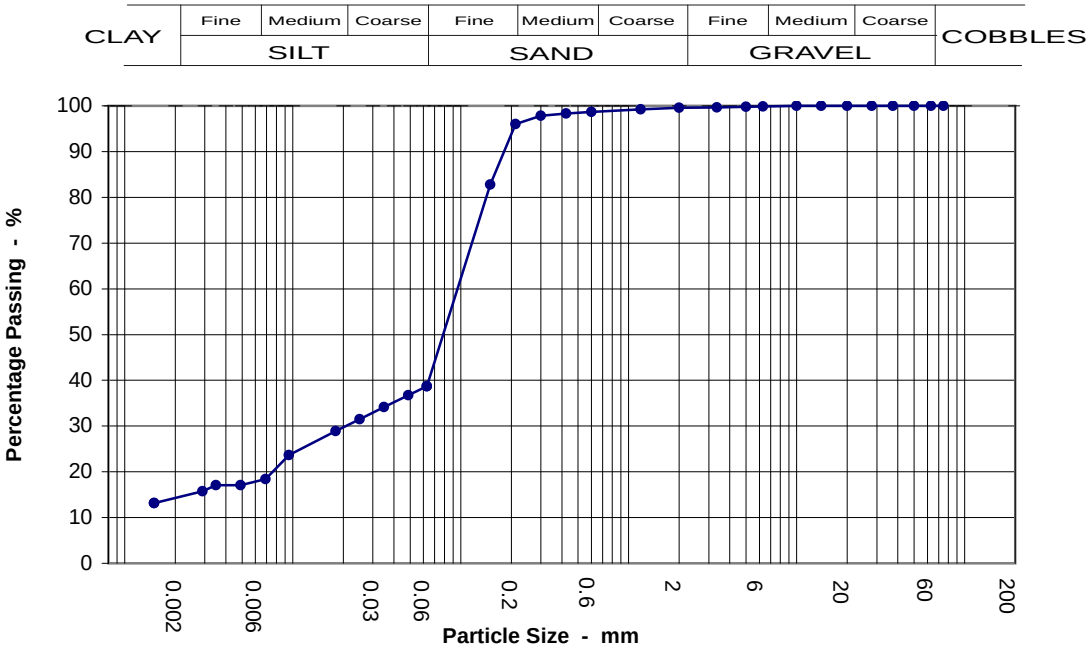
Grading Analysis	
D100	20.000
D60	0.289
D10	0.148
Uniformity Coefficient	2

PRIORITY GEOTECHNICAL

PARTICLE SIZE DISTRIBUTION

BS 1377 : Part 2 : 1990 : Clause 9

		Job Ref	**P13**
		Borehole / Pit No	S8
Location	**Dun Laoghaire**	Sample No	0
		Depth	0.00 m
Soil Description		Sample type	BLK



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.063	39
90	100	0.049	37
75	100	0.035	34
63	100	0.025	32
50	100	0.018	29
37.5	100	0.010	24
28	100	0.007	18
20	100	0.005	17
14	100	0.004	17
10	100	0.003	16
6.3	100	0.002	13
5	100		
3.35	100		
2	100		
1.18	99		
0.6	99		
0.425	98		
0.3	98		
0.212	96		
0.15	83		
0.063	39		

Test Method	
BS 1377 : Part 2 : 1990	
Sieving	Clause 9.2
Sedimentation	Clause 9.5

Sample Proportions	
Cobbles	0.0
Gravel	0.5
Sand	61.3
Silt	24.2
Clay	14.1

Grading Analysis	
D100	10.000
D60	0.105
D10	
Uniformity Coefficient	N/A

DRAWINGS

HS 109-1/13	**Bathymetry Survey**	**Scale 1:1000**
HS 109-2/13	**Bathymetry Survey**	**Scale 1:1000**
HS 109-3/13	**Bathymetry Survey**	**Scale 1:2000**
HS 109-4/13	**Sediment Sample Locations**	**Scale 1:1000**

SITE:

DUN LAOGHAIRE HARBOUR & APPROACHES

Sheet Title:

Bathymetric Survey of Dun Laoghaire Harbour

CLIENT:

Dun Laoghaire Harbour Company

SURVEYED BY:

HYDROGRAPHIC SURVEYS LTD
The Cobbles,
Crosshaven,
Co. Cork

tel: +353 21 4831184

JOB NUMBER:

PH13026

DRAWING NUMBER:

HS 109-1/13

DRAWN BY:

Gary Curtin

DATE:

November 2013

SCALE:	APPROVED:
1:1000 ON A0	J.B.J.

REVISION:

D01

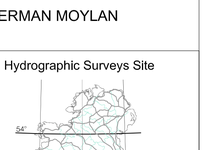
Memoir

1. Constructed on Irish National Grid.
2. Horizontal control by D.G.P.S.
3. Soundings in metres and decimetres reduced to Chart Datum.
4. Vertical accuracy = +/- 0.05m and Horizontal positioning accuracy = +/- 0.5m

CONSULTING ENGINEERS:

WATERMAN MOYLAN

Hydrographic Surveys Site



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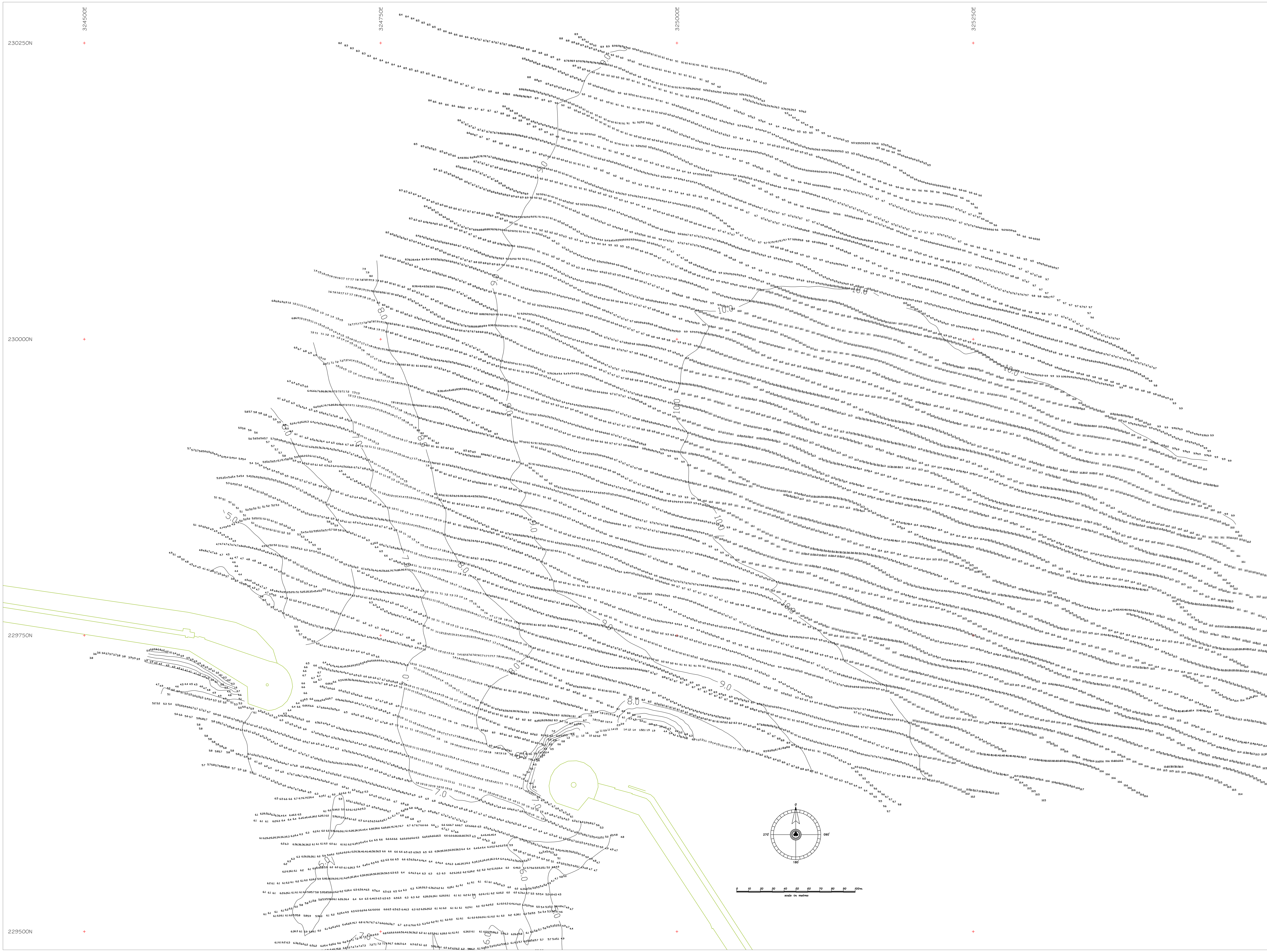
Hydrographic Surveys Ltd.



SITE:

DUN LAOGHAIRE HARBOUR & APPROACHES

Sheet Title:

Bathymetric Survey of Dun Laoghaire Harbour

CLIENT:

Dun Laoghaire Harbour Company

SURVEYED BY:

HYDROGRAPHIC SURVEYS LTD
The Cobbles,
Crosshaven,
Co. Cork

tel: +353 21 4831184

JOB NUMBER:

PH13026

DRAWING NUMBER:

HS 109-2/13

DRAWN BY:

Gary Curtin

DATE:

November 2013

SCALE:	APPROVED:
1:1000 ON A0	J.B.J.

REVISION:

D01

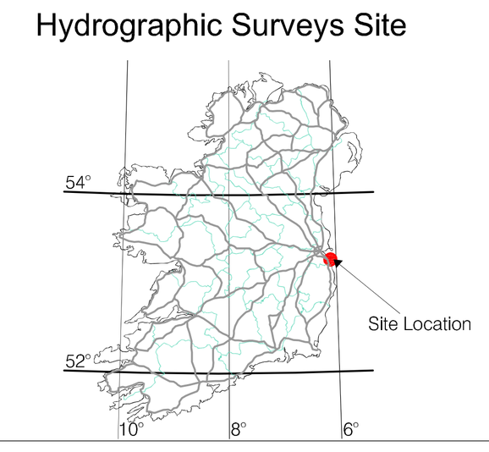
Memoir

1. Constructed on Irish National Grid.
2. Horizontal control by D.G.P.S.
3. Soundings in metres and decimetres reduced to Chart Datum.
4. Vertical accuracy = +/- 0.05m and Horizontal positioning accuracy = +/- 0.5m

CONSULTING ENGINEERS:

WATERMAN MOYLAN

Hydrographic Surveys Site



PRODUCED BY:

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tel: +353 21 4831184

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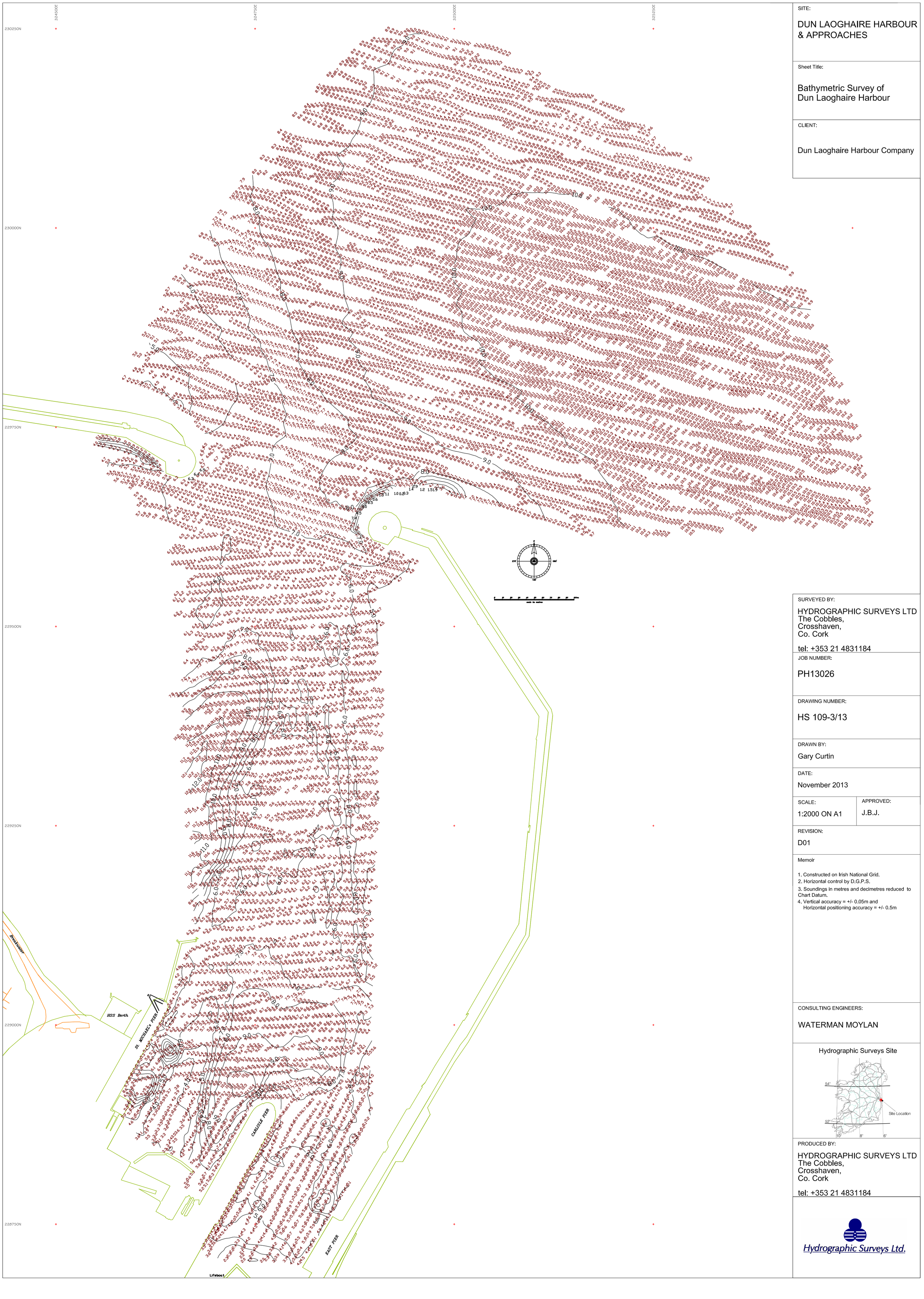

SITE:

DUN LAOGHAIRE HARBOUR & APPROACHES

Sheet Title:

Bathymetric Survey of Dun Laoghaire Harbour

CLIENT:

Dun Laoghaire Harbour Company

SURVEYED BY:

HYDROGRAPHIC SURVEYS LTD
The Cobbles,
Crosshaven,
Co. Cork

tel: +353 21 4831184

JOB NUMBER:

PH13026

DRAWING NUMBER:

HS 109-3/13

DRAWN BY:

Gary Curtin

DATE:

November 2013

SCALE:	APPROVED:
1:2000 ON A1	J.B.J.

REVISION:

D01

Memoir

1. Constructed on Irish National Grid.
2. Horizontal control by D.G.P.S.
3. Soundings in metres and decimetres reduced to Chart Datum.
4. Vertical accuracy = +/- 0.05m and Horizontal positioning accuracy = +/- 0.5m

CONSULTING ENGINEERS:

WATERMAN MOYLAN

Hydrographic Surveys Site

PRODUCED BY:

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Hydrographic Surveys Ltd.

324500E
324750E
325000E
325250E
230250N
230000N
229750N
229500N
229250N
229000N
228750N
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
Breakwater
HSS Berth
ST. MICHAEL's PIER
CARLISLE PIER
EAST PIER
Lifeboat
0°
090°
180°
270°
0 10 20 30 40 50 60 70 80 90 100m
scale 1in metres

SITE:

DUN LAOGHAIRE HARBOUR & APPROACHES

Sheet Title:

Dun Laoghaire Harbour Sediment Sample Locations

CLIENT:

Dun Laoghaire Harbour Company

SURVEYED BY:

HYDROGRAPHIC SURVEYS LTD
The Cobbles,
Crosshaven,
Co. Cork

tel: +353 21 4831184

JOB NUMBER:

PH13026

DRAWING NUMBER:

HS 109-4/13

DRAWN BY:

Gary Curtin

DATE:

November 2013

SCALE:

1:2000 ON A1

APPROVED:

J.B.J.

REVISION:

D01

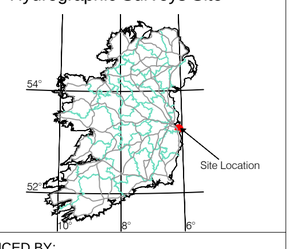
Memoir

1. Constructed on Irish National Grid.
2. Horizontal control by D.G.P.S.
3. Surface sediment sample locations shown thus: S10
4. Horizontal positioning accuracy = +/- 0.5m

CONSULTING ENGINEERS:

WATERMAN MOYLAN

Hydrographic Surveys Site



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Hydrographic Surveys Ltd.