

Barry Jenkins
Hydrographic Surveys Ltd
The Cobbles
Crosshaven
Co Cork

Dear Barry

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

Samples Taken on: 16-Dec-2008
Samples Registered on: 22-Dec-2008
Results for Batch Number 20012238
You will be invoiced shortly by our accounts department.

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

Yours sincerely



William Fardon
Customer Services Team Leader
Tel: (0113) 231 2177
nls@environment-agency.gov.uk

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Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation. Details of analytical procedures and performance data are available on request. The date of sample analysis is available on request.

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The Environment Agency and/or its staff does not therefore accept any liability for the consequences of any acts or omissions made on the basis of the analysis or advice or interpretation provided.

Haulbowline Naval Base Sediment Sample Results 16 Dec 2008

Sample Number	Depth M	Position Latitude	Position Longitude	Visual appearance life signs eg worms?	% Moisture	% >2mm	% <2mm >63um	% <63um	% OC
NB0	surface grab sample	51d 50.4329'	008d 17.9464'	Thick grey sediment, density 1.61g/ml	51.01	0	5.184	94.8	1.02
NB1	surface grab sample	51d 50.4760'	008d 17.9807'	Thick grey sediment, density 1.63g/ml	49.48	0	18.76	81.2	1.53
NB2	surface grab sample	51d 50.4438'	008d 17.9090'	Thick grey sediment, density 1.35g/ml	49.01	0	11.44	88.6	2.12
NB3	surface grab sample	51d 50.4321'	008d 17.8524'	Thick grey sediment, density 1.50g/ml	51.93	0	11.35	88.5	2.34
NB4	surface grab sample	51d 50.5112'	008d 17.9165'	Thick grey sediment, density 1.35g/ml	47.96	0	0.18	99.8	1.91
NB5	surface grab sample	51d 50.5451'	008d 17.9663'	Thick grey sediment, density 1.51g/ml	41.64	0	16.29	83.7	1.50
NB6	surface grab sample	51d 50.5423'	008d 17.9724'	Thick grey sediment, density 1.52g/ml	37.83	0	5.22	94.8	2.51
NB7	surface grab sample	51d 50.5773'	008d 18.0318'	Thick grey sediment, density 1.24g/ml	58.30	0	34.46	65.6	2.18
NB8	surface grab sample	51d 50.5257'	008d 18.1542'	Thick grey sediment, density 1.35g/ml	55.16	0	16.11	83.9	2.29

Sample Number	TEH g kg ⁻¹	METAL Cu mg kg ⁻¹	METAL Zn mg kg ⁻¹	METAL Cd mg kg ⁻¹	METAL Hg mg kg ⁻¹	METAL Pb mg kg ⁻¹	METAL As mg kg ⁻¹	METAL Cr mg kg ⁻¹
NB0	0.748	26.1	123	0.263	0.0883	39.9	9.16	39.3
NB1	0.174	41	181	0.354	0.102	53.8	10.7	48.6
NB2		23.4	113	0.218	0.0869	37.4	9.12	36.6
NB3	0.212	29.6	159	0.333	0.132	54.2	8	35.2
NB4		25.9	148	0.262	0.0958	42.4	8.41	35.4
NB5	0.206	76.5	630	0.62	0.11	118	8.38	42.3
NB6		118	1840	0.652	0.125	289	9.17	52.7
NB7	0.297	20	102	0.289	0.0775	34.4	6.07	29.4
NB8	0.175	29.9	116	0.519	0.13	106	6.12	30.5

Sample Number	METAL Ni mg kg ⁻¹	METAL Li mg kg ⁻¹	METAL Al mg kg ⁻¹	OT DBT mg kg ⁻¹	T TBT mg kg ⁻¹	OT Σ TBT + DBT mg kg ⁻¹	PCB 028 ug kg ⁻¹	PCB 052 ug kg ⁻¹
NB0	26.2	43.7	18000	<0.00700	<0.00700		0.54	<0.240
NB1	31	48.2	21000	0.01	0.01	0.02	0.73	<0.610
NB2	25.7	42	15300	<0.00700	<0.00700			
NB3	23	38.7	15200	0.02	0.02	0.04	0.49	<0.350
NB4	23.7	39.5	14400	0.01	0.01	0.02		
NB5	22.7	29.3	9560	0.05	0.05	0.1	6.3	12.1
NB6	29.7	34.7	12400	0.08	0.08	0.16		
NB7	21.5	34.8	11100	<0.006	<0.008		0.16	<0.960
NB8	23.5	35.8	11100	<0.008	0.01		0.24	<0.520

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Sample Number	PCB 101 ug kg ⁻¹	PCB 138 ug kg ⁻¹	PCB 153 ug kg ⁻¹	PCB 180 ug kg ⁻¹	PCB 118 ug kg ⁻¹	PAH Acenaphthene ug kg ⁻¹	PAH Acenaphthylene ug kg ⁻¹	PAH Anthracene ug kg ⁻¹	PAH Benzo a anthracene ug kg ⁻¹	PAH Benzo (a) pyrene ug kg ⁻¹
NB0	0.27	<0.100	0.26	<0.100	0.23	10.1	<15.8	19.5	53.3	59.6
NB1	0.42	<0.170	0.24	<0.1	0.36	9.96	<15.1	22.6	<13.4	83.9
NB2										
NB3	0.42	<0.310	0.33	<0.1	0.38	7.74	<15.8	20.7	58.5	<70.3
NB4										
NB5	6.38	15	16.3	10.3	4.34	8.45	<19.6	31.1	88.7	<98.8
NB6										
NB7	0.26	0.32	0.36	<0.10	0.35	75.5	<12.3	21.9	104	110
NB8	0.12	<0.10	<0.10	<0.10	<0.1	8.12	<14.3	20.4	57.3	61.9

Sample Number	PAH Benzo b fluoranthene ug kg ⁻¹	PAH Benzo ghi perylene ug kg ⁻¹	PAH Benzo k fluoranthene ug kg ⁻¹	PAH Chrysene ug kg ⁻¹	PAH Dibenzo a,h anthracene ug kg ⁻¹	PAH Flourene ug kg ⁻¹	PAH Fluoranthene ug kg ⁻¹	PAH 1,2,3 - cd pyrene ug kg ⁻¹	PAH Naphthalene ug kg ⁻¹	PAH Phenanthrene ug kg ⁻¹
NB0	90.4	60	<45.8	68.4	13.5	27.3	113	80.9	84.8	70
NB1	110	75.7	<51.4	81.2	16.5	28.9	135	97.6	91.3	77.8
NB2										
NB3	97.6	69.4	<46.8	76.8	17.1	20.4	121	89.8	68	68.5
NB4										
NB5	115	82.8	<49.5	109	20	25.5	181	100	67.1	110
NB6										
NB7	127	79.9	62.4	122	23.8	80.4	169	106	115	116
NB8	83.9	59.7	<38.4	73.2	14.2	27.9	112	78.7	98.8	75.4

Sample Number	PAH Pyrene ug kg ⁻¹	OCP HCH Gamma ug kg ⁻¹	OCP HCB ug kg ⁻¹
NB0	95.1	<3.0	<3.0
NB1	114	<3.0	<3.0
NB2			
NB3	115	<3.0	<3.0
NB4			
NB5	165	<3.0	<3.0
NB6			
NB7	134	<3.0	<3.0
NB8	107	<3.0	<3.0

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Sample Number	Notes / comments:
NB0	14.9g of the sample taken for drying at <30degC which gave 7.3g of dried sample. sieved to <10mm before being crushed using a pestle and mortar.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.
NB1	22.86g of the sample was dried at <30degC which gave 11.55g of dried sample.Sieved to <10mm before being crushed using a pestle and mortar.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 reported as determined at <30degC.
NB2	18.78g of the sample was taken for drying at <30degC which gave 9.56g of dried sample.The sample was sieved to <10mm before being crushed using a pestle and mortar.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.
NB3	17.6g of the sample was taken for drying at <30degC which gave 8.46g of dried sample.The sample was sieved to <10mm before being crushed using a pestle and mortar.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.
NB4	18.75g of the sample was taken for drying at <30degC which gave 9.56g of dried sample.The sample was sieved to <10mm before being crushed using a pestle and mortar.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.
NB5	19.38g of the sample was taken for drying at <30degC which gave 11.31g of dried sample.The sample was sieved to <10mm before being crushed using a pestle and mortar.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.
NB6	20.91g of the sample was taken for drying at <30degC which gave 13.0g of dried sample.The sample was sieved to <10mm before being crushed using a pestle and mortar.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.
NB7	20.6g of the sample was taken for drying at <30degC which gave 8.59g of dried sample.The sample was sieved to <10mm before being crushed using a pestle and mortar.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.
NB8	22.57g of the sample was taken for drying at <30degC which gave 10.12g of dried sample.The sample was sieved to <10mm before being crushed using a pestle and mortar.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.

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Reference Type	Reference Material	% OC	TEH g kg ⁻¹	METAL Cu mg kg ⁻¹	METAL Zn mg kg ⁻¹	METAL Cd mg kg ⁻¹	TAL Hg mg l
Certified reference material (meas)	CRM 1944	0.525		31.1	146	0.202	0.0891

Reference Type	METAL Pb mg kg ⁻¹	METAL As mg kg ⁻¹	METAL Cr mg kg ⁻¹	METAL Ni mg kg ⁻¹	METAL Li mg kg ⁻¹	METAL Al mg kg ⁻¹	T DBT mg kg ⁻¹
Certified reference material (meas)	20	18.9	72	42.6	69	50500	0.887

Reference Type	OT TBT mg kg ⁻¹	OT Σ TBT + DBT mg kg ⁻¹	PCB 028 ug kg ⁻¹	PCB 052 ug kg ⁻¹	PCB 101 ug kg ⁻¹	PCB 138 ug kg ⁻¹	PCB 153 ug kg ⁻¹
Certified reference material (meas)	0.429	1.316	107	130	98.8	55.5	73.1

Reference Type	PCB 180 ug kg ⁻¹	PCB 118 ug kg ⁻¹	Σ 7 PCB ug kg ⁻¹	PAH Acenaphthene ug kg ⁻¹	PAH Acenaphthylene ug kg ⁻¹	PAH Anthracene ug kg ⁻¹	PAH Benzo (a) anthracene ug kg ⁻¹
Certified reference material (meas)	42	74.6	581	388	2460	1390	4310

Reference Type	PAH Benzo (a) pyrene ug kg ⁻¹	PAH Benzo (b) fluoranthene ug kg ⁻¹	PAH Benzo (ghi) perylene ug kg ⁻¹	PAH Benzo (k) fluoranthene ug kg ⁻¹	PAH Chrysene ug kg ⁻¹	PAH Dibenzo (a,h) anthracene ug kg ⁻¹	PAH Flourene ug kg ⁻¹
Certified reference material (meas)	3530	3470	2450	1750	5410	655	516

Reference Type	PAH Fluoranthene ug kg ⁻¹	PAH Indeno (1,2,3 - cd) pyrene ug kg ⁻¹	PAH Naphthalene ug kg ⁻¹	PAH Phenanthrene ug kg ⁻¹	PAH Pyrene ug kg ⁻¹	OCP HCH Gamma ug kg ⁻¹	OCP HCB ug kg ⁻¹
Certified reference material (meas)	10800	2570	1840	6260	11000	<3.00	<3.0

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Key	Value
Location:	Area eg Haulbowline naval base
Date of sampling:	
CRMs used:	Certified reference materials used in analyses for metals, organics & TBT Which fraction of sediment was analysed? < 2mm is requested, but some labs use < 63mm.
Fraction analysed: Are results reported as wet weight or dry wt?	Were analyses carried out on wet or dry sediment?
Laboratory	Main laboratory where samples are sent to for analysis
Sub-contract	Sub-contracted laboratory where samples are sent by Main Laboratory
Sample no.	Sample number assigned by sampler
Sample id	Sample number assigned by analysing laboratory
Position (dd/mm.ss)	Position where sample was taken. To be reported in either degree / minute / decimal minute or in metres. Please also list datum and projection.
Units	Units of concentration
H ₂ O	Water content of sample, reported as %
<2mm	Grain size % < 2mm
<63um	Grain size % < 63mm
OC	Organic carbon (NOT organic matter)
TEH	Total extractable hydrocarbons
Cu	Copper
Zn	Zinc
Cd	Cadmium
Hg	Mercury
Pb	Lead
As	Arsenic
Cr	Chromium
Mn	Manganese
Ni	Nickel
Li	Lithium
Al	Aluminium
DBT	Dibutyl tin
TBT	Tributyl tin
Σ TBT + DBT	Sum of di-butyl tin & tri-butyl tin
PCB 028	
PCB 052	
PCB 101	
PCB 138	
PCB 153	

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PCB 180	
PCB 118	
Σ 7 PCB	Sum of the seven ICES polychlorinated biphenyls previously listed
Acenaphthene	
Acenaphthylene	
Anthracene	
Benzo (a) anthracene	
Benzo (a) pyrene	
Benzo (b) fluoranthene	
Benzo (ghi) perylene	
Benzo (k) fluoranthene	
Chrysene	
Dibenz (a,h) anthracene	
Flourene	
Fluoranthene	
Indeno (1,2,3 – cd) pyrene	
Naphthalene	
Phenanthrene	
Pyrene	
Σ 13 PAH	Sum of 13 polycyclic aromatic hydrocarbons
HCH Gamma	1 α ,2 α ,3 β ,4 α ,5 α ,6 β -hexachlorocyclohexane (Lindane)
HCB	Hexachlorobenzene

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