3FMProject

Bringing
Dublin Port
To 2040

Environmental Impact Assessment Report

Appendix 8.4

Volume 3 Part 6

COMHLACHT CHALAFORT ÁTHA CLIATH
DUBLIN PORT COMPANY

RPS
A TETRA TECH COMPANY

Third & Final
Masterplan
Project

Appendix 8.4

The results in this appendix are in the following order:

1. Surface Grab Samples
   - Laboratory Results
   - Results presented in EPA Format
2. Vibrocore Samples
   - Laboratory Results
   - Results presented in EPA Format
3. Borehole Samples
   - Laboratory Results
   - Results presented in EPA Format
4. Additional 9 Surface and Vibrocore Samples
   - Laboratory Results
   - Results presented in EPA Format
5. Radiological Sample Results
6. Surface Samples at proposed Wharf N
   - Laboratory Results
   - Results presented in EPA format
7. Vibrocore Samples at proposed Wharf N
   - Laboratory Results
   - Results presented in EPA format

Surface Grab Samples

- Laboratory Results (Samples taken in October 2022)
- Results presented in EPA Format (Samples taken in October 2022)
- Laboratory Results (S35)
- Results presented in EPA Format (S35)

Certificate of Analysis

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

Test Report ID	**MAR01612**
Issue Version	1
Customer	Aquatic Services Unit, Environmental Research Institute, Lee Road, Cork, Ireland
Customer Reference	Dublin Port Sediment Samples
Date Sampled	28-Sep-2022 & 21-Oct-2022
Date Received	27-Oct-22
Date Reported	28-Nov-22
Condition of samples	Ambient Satisfactory

Authorised by:	Marya Hubbard
Position:	Laboratory Manager

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

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Method No	SUB_01*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Visual Description**
S1	MAR01612.001	Sediment	Greyish brown sandy SILT
S3	MAR01612.002	Sediment	Greyish brown slightly sandy SILT
S4	MAR01612.003	Sediment	Brownish grey slightly sandy SILT
S5	MAR01612.004	Sediment	Greyish brown sandy SILT
S6	MAR01612.005	Sediment	Brownish grey clayey SILT
S8	MAR01612.006	Sediment	Brownish grey slightly sandy SILT
S11	MAR01612.007	Sediment	Brownish grey sandy SILT
S12	MAR01612.008	Sediment	Greyish brown slightly sandy SILT
S15	MAR01612.009	Sediment	Greyish brown sandy SILT
S17	MAR01612.010	Sediment	Greyish brown slightly sandy SILT
S20	MAR01612.011	Sediment	Greyish brown slightly sandy SILT
S21	MAR01612.012	Sediment	Brownish grey slightly sandy SILT
S23	MAR01612.013	Sediment	Greyish brown slightly sandy SILT
S26	MAR01612.014	Sediment	Brownish grey silty CLAY
S28	MAR01612.015	Sediment	Brownish grey sandy SILT
S30	MAR01612.016	Sediment	Greyish brown slightly sandy SILT
S31	MAR01612.017	Sediment	Greyish brown slightly sandy SILT
S32	MAR01612.018	Sediment	Greyish brown slightly sandy SILT
S34	MAR01612.019	Sediment	Brownish grey silty CLAY
S37	MAR01612.020	Sediment	Greyish brown slightly sandy SILT
S38	MAR01612.021	Sediment	Brownish grey clayey SILT
S39	MAR01612.022	Sediment	Brownish grey sandy SILT with rare shell fragments
S42	MAR01612.023	Sediment	Greyish brown sandy SILT
S43	MAR01612.024	Sediment	Greyish brown slightly sandy SILT

* See Report Notes

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	%	%	Mg/m3	% m/m	%m/m
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	WSLM59*	ANC*
		Limit of Detection	0.2	0.2	N/A	0.02	0.12
		Accreditation	UKAS	UKAS	N	UKAS	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Particle Density**	**TOC**	**Carbonate Equivalent (%CO3)**
S1	MAR01612.001	Sediment	56.4	43.6	2.59	2.61	9.12
S3	MAR01612.002	Sediment	51.0	49.0	2.58	2.25	4.56
S4	MAR01612.003	Sediment	56.5	43.5	2.60	2.86	6.24
S5	MAR01612.004	Sediment	54.8	45.2	2.57	2.59	8.88
S6	MAR01612.005	Sediment	61.1	38.9	2.60	2.86	7.44
S8	MAR01612.006	Sediment	47.9	52.1	2.57	2.59	5.52
S11	MAR01612.007	Sediment	62.9	37.1	2.56	2.61	10.1
S12	MAR01612.008	Sediment	43.4	56.6	2.64	1.59	9.36
S15	MAR01612.009	Sediment	45.3	54.7	2.60	1.96	9.12
S17	MAR01612.010	Sediment	44.4	55.6	2.61	1.69	8.16
S20	MAR01612.011	Sediment	54.2	45.8	2.60	1.94	5.52
S21	MAR01612.012	Sediment	48.9	51.1	2.59	2.15	6.96
S23	MAR01612.013	Sediment	46.9	53.1	2.62	1.77	7.44
S26	MAR01612.014	Sediment	63.3	36.7	2.55	3.16	6.72
S28	MAR01612.015	Sediment	54.0	46.0	2.62	2.22	10.8
S30	MAR01612.016	Sediment	57.9	42.1	2.57	2.31	6.00
S31	MAR01612.017	Sediment	68.8	31.2	2.46	3.65	9.60
S32	MAR01612.018	Sediment	53.9	46.1	2.53	2.41	10.1
S34	MAR01612.019	Sediment	73.4	26.6	2.52	3.97	9.84
S37	MAR01612.020	Sediment	65.0	35.0	2.57	1.98	3.60
S38	MAR01612.021	Sediment	43.7	56.3	2.62	1.43	9.36
S39	MAR01612.022	Sediment	30.5	69.5	2.66	0.25	9.84
S42	MAR01612.023	Sediment	46.8	53.2	2.58	1.66	9.12
S43	MAR01612.024	Sediment	65.7	34.3	2.51	4.32	9.36
		Reference Material (% Recovery)	NA	NA	NA	102	102
		QC Blank	NA	NA	NA	<0.02	<0.12

* See Report Notes

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
S1	MAR01612.001	Sediment	13.4	1.12	69.3	49.5	70.3	0.25	32.5
S3	MAR01612.002	Sediment	14.1	1.16	65.8	47.5	71.2	0.25	33.6
S4	MAR01612.003	Sediment	15.9	1.45	71.9	56.5	74.6	0.26	34.2
S5	MAR01612.004	Sediment	14.9	1.20	68.5	49.3	59.0	0.29	31.3
S6	MAR01612.005	Sediment	16.3	1.19	73.0	65.0	64.7	0.27	31.4
S8	MAR01612.006	Sediment	12.3	1.05	65.5	59.6	54.5	0.23	28.1
S11	MAR01612.007	Sediment	12.9	0.71	61.2	50.4	32.6	0.16	27.9
S12	MAR01612.008	Sediment	9.8	0.53	53.2	31.8	31.3	0.16	23.9
S15	MAR01612.009	Sediment	10.6	0.57	57.5	42.4	31.4	0.15	23.4
S17	MAR01612.010	Sediment	8.9	0.51	55.9	36.0	33.3	0.22	20.1
S20	MAR01612.011	Sediment	9.9	0.58	60.2	39.8	32.9	0.15	24.1
S21	MAR01612.012	Sediment	11.5	0.61	64.4	44.3	38.2	0.17	27.1
S23	MAR01612.013	Sediment	9.7	0.51	60.4	35.1	34.1	0.14	27.5
S26	MAR01612.014	Sediment	15.1	0.76	67.7	67.1	37.6	0.19	31.3
S28	MAR01612.015	Sediment	11.7	0.53	69.4	43.4	43.1	0.17	31.6
S30	MAR01612.016	Sediment	11.0	0.56	67.9	47.1	34.5	0.14	27.6
S31	MAR01612.017	Sediment	14.3	0.72	70.9	68.3	39.4	0.18	31.5
S32	MAR01612.018	Sediment	14.1	0.71	74.2	55.3	45.9	0.18	33.5
S34	MAR01612.019	Sediment	16.8	0.84	68.9	84.0	42.4	0.20	31.1
S37	MAR01612.020	Sediment	7.0	0.47	43.5	36.1	29.1	0.17	22.3
S38	MAR01612.021	Sediment	7.8	0.48	53.4	27.2	32.2	0.14	26.3
S39	MAR01612.022	Sediment	4.7	0.16	36.6	11.1	24.4	0.22	14.3
S42	MAR01612.023	Sediment	7.6	0.38	41.7	36.6	38.4	0.22	18.4
S43	MAR01612.024	Sediment	14.2	0.69	55.8	100	38.3	0.25	24.0
CRM1	MAR01612.025	Sediment	20	0.23	93.7	34.1	27.4	0.15	40.0
		Certified Reference Material 2702 (Measured Value)	41.05	0.908	285	103.8	113.6	0.475	70.43
		Certified Reference Material 2702 (Certified Value)	45.3	0.817	352	117.7	132.8	0.447	75.4
		Certified Reference Material 2702 (% Recovery)	95	115	98	98	97	103	104
		QC Blank	<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
S1	MAR01612.001	Sediment	222	49500	56.3
S3	MAR01612.002	Sediment	245	48500	55.1
S4	MAR01612.003	Sediment	265	49900	61.6
S5	MAR01612.004	Sediment	226	57500	66.1
S6	MAR01612.005	Sediment	252	57900	67.3
S8	MAR01612.006	Sediment	210	49600	57.7
S11	MAR01612.007	Sediment	139	51000	57.0
S12	MAR01612.008	Sediment	107	46900	51.1
S15	MAR01612.009	Sediment	121	48700	53.0
S17	MAR01612.010	Sediment	123	41200	42.6
S20	MAR01612.011	Sediment	118	45400	49.7
S21	MAR01612.012	Sediment	138	51500	58.0
S23	MAR01612.013	Sediment	114	47900	52.4
S26	MAR01612.014	Sediment	167	52300	58.4
S28	MAR01612.015	Sediment	134	57800	66.3
S30	MAR01612.016	Sediment	135	50200	56.0
S31	MAR01612.017	Sediment	174	52100	59.4
S32	MAR01612.018	Sediment	159	58700	66.8
S34	MAR01612.019	Sediment	187	52900	60.2
S37	MAR01612.020	Sediment	104	35200	36.4
S38	MAR01612.021	Sediment	96.5	44300	47.8
S39	MAR01612.022	Sediment	43.7	25700	23.3
S42	MAR01612.023	Sediment	103	30700	30.2
S43	MAR01612.024	Sediment	191	39400	41.9
CRM1	MAR01612.025	Sediment	140	95600	90.3
		Certified Reference Material 2702 (Measured Value)	412.5	95621	86
		Certified Reference Material 2702 (Certified Value)	485.3	84000	78.2
		Certified Reference Material 2702 (% Recovery)	99	105	99
		QC Blank	<3.5	<1750	<2

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
S1	MAR01612.001	Sediment	<5	15.8
S3	MAR01612.002	Sediment	10.7	12.2
S4	MAR01612.003	Sediment	12.1	23.7
S5	MAR01612.004	Sediment	<5	<5
S6	MAR01612.005	Sediment	<5	48.6
S8	MAR01612.006	Sediment	19.4	40.9
S11	MAR01612.007	Sediment	<5	<5
S12	MAR01612.008	Sediment	<5	<5
S15	MAR01612.009	Sediment	<5	<5
Certified Reference Material BCR-646 (Measured Value)			788	458
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			102	95
QC Blank			<1	<1

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
S17	MAR01612.010	Sediment	<5	<5
S20	MAR01612.011	Sediment	<5	<5
S21	MAR01612.012	Sediment	<5	<5
S23	MAR01612.013	Sediment	<5	<5
S26	MAR01612.014	Sediment	<5	<5
S28	MAR01612.015	Sediment	<5	<5
S30	MAR01612.016	Sediment	<5	<5
S31	MAR01612.017	Sediment	<5	<5
S32	MAR01612.018	Sediment	<5	<5
S34	MAR01612.019	Sediment	<5	<5
S37	MAR01612.020	Sediment	<5	<5
S38	MAR01612.021	Sediment	<5	<5
S39	MAR01612.022	Sediment	<5	<5
S42	MAR01612.023	Sediment	10.1	<5
S43	MAR01612.024	Sediment	<5	<5
CRM3	MAR01612.027	Sediment	301	246
		Certified Reference Material BCR-646 (Measured Value)	801	454
		Certified Reference Material BCR-646 (Certified Value)	770	480
		Certified Reference Material BCR-646 (% Recovery)	104	95
		QC Blank	<1	<1

* See Report Notes

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
S1	MAR01612.001	Sediment	16.7	66.6	88.4	220	350	287
S3	MAR01612.002	Sediment	21.0	43.2	78.6	222	338	306
S4	MAR01612.003	Sediment	30.7	73.8	140	455	635	515
S5	MAR01612.004	Sediment	27.6	75.3	99.6	435	629	516
S6	MAR01612.005	Sediment	18.1	64.8	112	270	384	320
S8	MAR01612.006	Sediment	16.1	51.2	70.6	198	308	264
S11	MAR01612.007	Sediment	8.35	15.2	22.6	52.9	80.8	82.0
S12	MAR01612.008	Sediment	11.3	26.4	41.7	124	155	136
S15	MAR01612.009	Sediment	13.5	18.9	47.8	120	158	144
Certified Reference Material QPH107MS (Measured Value)			3.00	3.91	6.70	20.7	25.7	35.3
Certified Reference Material QPH107MS (Certified Value)			3.75	3.25	7.95	24.7	34.9	49.1
Certified Reference Material QPH107MS (% Recovery)			80	120	84	84	74	72
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
S1	MAR01612.001	Sediment	255	296	229	48.9	288	44.1
S3	MAR01612.002	Sediment	276	288	228	41.7	387	45.6
S4	MAR01612.003	Sediment	412	492	476	84.2	752	72.5
S5	MAR01612.004	Sediment	417	499	467	86.5	599	63.6
S6	MAR01612.005	Sediment	266	299	271	56.0	385	58.0
S8	MAR01612.006	Sediment	232	252	216	47.7	258	49.7
S11	MAR01612.007	Sediment	77.7	72.2	68.5	15.7	72.3	21.0
S12	MAR01612.008	Sediment	121	139	135	26.4	204	25.2
S15	MAR01612.009	Sediment	115	127	138	25.4	199	25.2
Certified Reference Material QPH107MS (Measured Value)			41.5	46.9	31.8	5.65	45.6	5.38
Certified Reference Material QPH107MS (Certified Value)			39.8	20.6	37.2	7.66	50.3	6.06
Certified Reference Material QPH107MS (% Recovery)			104	114	85	74	91	89
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
S1	MAR01612.001	Sediment	238	50.4	140	378	586000
S3	MAR01612.002	Sediment	243	47.1	185	493	517000
S4	MAR01612.003	Sediment	410	62.8	336	839	632000
S5	MAR01612.004	Sediment	411	62.5	221	722	657000
S6	MAR01612.005	Sediment	268	56.6	206	436	679000
S8	MAR01612.006	Sediment	227	54.9	136	349	671000
S11	MAR01612.007	Sediment	77.1	27.9	59.3	105	809000
S12	MAR01612.008	Sediment	122	33.1	103	225	334000
S15	MAR01612.009	Sediment	114	28.2	119	217	378000
Certified Reference Material QPH107MS (Measured Value)			31.1	15.3	40.1	44.0	1432~
Certified Reference Material QPH107MS (Certified Value)			38.3	17.4	44.8	48.9	1400~
Certified Reference Material QPH107MS (% Recovery)			81	88	89	90	102~
QC Blank			<1	<1	<1	<1	<100

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
S17	MAR01612.010	Sediment	34.9	34.7	115	137	190	157
S20	MAR01612.011	Sediment	17.9	29.6	37.3	109	167	136
S21	MAR01612.012	Sediment	16.1	27.8	37.3	91.0	134	120
S23	MAR01612.013	Sediment	6.80	19.2	25.5	60.5	84.0	74.3
S26	MAR01612.014	Sediment	7.65	18.4	25.8	61.2	87.4	86.1
S28	MAR01612.015	Sediment	7.61	15.3	18.7	53.7	77.5	88.7
S30	MAR01612.016	Sediment	6.26	14.9	19.8	55.8	84.0	82.7
S31	MAR01612.017	Sediment	10.7	13.6	29.6	86.0	111	113
S32	MAR01612.018	Sediment	11.9	30.0	40.6	118	160	146
S34	MAR01612.019	Sediment	12.0	32.0	31.6	92.1	150	140
S37	MAR01612.020	Sediment	11.5	24.5	34.5	84.5	136	112
S38	MAR01612.021	Sediment	7.18	23.4	31.2	94.6	125	123
S39	MAR01612.022	Sediment	1.77	10.5	10.5	28.9	40.0	32.0
S42	MAR01612.023	Sediment	29.1	49.8	128	305	397	289
Certified Reference Material QPH107MS (Measured Value)			3.10	4.51	6.03	21.5	27.8	42.5
Certified Reference Material QPH107MS (Certified Value)			3.75	3.25	7.95	24.7	34.9	49.1
Certified Reference Material QPH107MS (% Recovery)			83	139	76	87	80	86
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
S17	MAR01612.010	Sediment	122	154	153	24.1	282	50.5
S20	MAR01612.011	Sediment	120	143	125	22.7	162	27.4
S21	MAR01612.012	Sediment	103	110	104	19.5	139	31.1
S23	MAR01612.013	Sediment	66.0	75.6	67.4	12.0	78.3	19.5
S26	MAR01612.014	Sediment	82.2	101	76.9	16.0	91.4	19.0
S28	MAR01612.015	Sediment	76.3	74.1	71.0	14.7	82.5	19.2
S30	MAR01612.016	Sediment	72.3	69.9	72.8	15.3	86.4	16.8
S31	MAR01612.017	Sediment	100	88.6	105	19.4	147	23.3
S32	MAR01612.018	Sediment	122	138	138	26.1	152	30.8
S34	MAR01612.019	Sediment	138	134	123	27.1	132	32.7
S37	MAR01612.020	Sediment	101	118	93.3	20.4	106	27.4
S38	MAR01612.021	Sediment	99.9	113	104	20.1	138	24.0
S39	MAR01612.022	Sediment	24.8	35.3	31.6	6.02	36.5	6.56
S42	MAR01612.023	Sediment	223	314	328	44.3	495	70.5
Certified Reference Material QPH107MS (Measured Value)			37.0	38.6	30.3	6.84	44.8	5.22
Certified Reference Material QPH107MS (Certified Value)			39.8	20.6	37.2	7.66	50.3	6.06
Certified Reference Material QPH107MS (% Recovery)			93	94	81	89	89	86
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
S17	MAR01612.010	Sediment	119	66.8	182	389	293000
S20	MAR01612.011	Sediment	117	35.2	111	183	484000
S21	MAR01612.012	Sediment	105	53.8	101	166	403000
S23	MAR01612.013	Sediment	65.0	26.4	55.4	116	275000
S26	MAR01612.014	Sediment	80.7	25.4	66.8	114	660000
S28	MAR01612.015	Sediment	76.5	26.0	60.9	95.0	417000
S30	MAR01612.016	Sediment	69.9	24.1	65.7	101	513000
S31	MAR01612.017	Sediment	102	47.4	92.4	168	738000
S32	MAR01612.018	Sediment	128	34.0	93.0	220	443000
S34	MAR01612.019	Sediment	142	45.1	93.3	166	1220000
S37	MAR01612.020	Sediment	101	42.6	74.9	164	755000
S38	MAR01612.021	Sediment	103	25.8	63.6	160	327000
S39	MAR01612.022	Sediment	25.9	8.54	17.6	69.5	85300
S42	MAR01612.023	Sediment	223	55.5	292	659	536000
		Certified Reference Material QPH107MS (Measured Value)	33.6	15.3	38.6	43.0	1414~
		Certified Reference Material QPH107MS (Certified Value)	38.3	17.4	44.8	48.9	1400~
		Certified Reference Material QPH107MS (% Recovery)	88	88	86	88	101~
		QC Blank	<1	<1	<1	<1	<100

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
S43	MAR01612.024	Sediment	41.6	20.8	48.7	176	214	188
CRM2	MAR01612.026	Sediment	4.77	6.77	10.9	43.8	61.7	97.8
CRM4	MAR01612.028	Sediment	25.5	57.4	116	218	217	377
Certified Reference Material QPH107MS (Measured Value)			3.30	4.76	7.87	22.8	33.5	38.1
Certified Reference Material QPH107MS (Certified Value)			3.75	3.25	7.95	24.7	34.9	49.1
Certified Reference Material QPH107MS (% Recovery)			88	146	99	92	96	77
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
S43	MAR01612.024	Sediment	145	181	212	29.4	434	35.0
CRM2	MAR01612.026	Sediment	104	41.8	61.4	15.6	91.0	10.3
CRM4	MAR01612.028	Sediment	213	170	325	53.6	499	49.9
Certified Reference Material QPH107MS (Measured Value)			37.0	34.1	31.0	6.78	46.6	6.13
Certified Reference Material QPH107MS (Certified Value)			39.8	20.6	37.2	7.66	50.3	6.06
Certified Reference Material QPH107MS (% Recovery)			93	83	83	89	93	101
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

			Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
			Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
			Limit of Detection	1	1	1	1	100
			Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**		**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
S43	MAR01612.024	Sediment		140	26.4	316	451	871000
CRM2	MAR01612.026	Sediment		106	32.1	67.9	88.6	NA
CRM4	MAR01612.028	Sediment		250	498	318	401	NA
			Certified Reference Material QPH107MS (Measured Value)	35.2	17.2	40.0	47.0	1491~
			Certified Reference Material QPH107MS (Certified Value)	38.3	17.4	44.8	48.9	1400~
			Certified Reference Material QPH107MS (% Recovery)	92	99	89	96	106~
			QC Blank	<1	<1	<1	<1	<100

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

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
S1	MAR01612.001	Sediment	1.60	0.84	0.67	0.90	0.90	0.72	0.41
S3	MAR01612.002	Sediment	2.24	1.07	0.75	0.83	0.95	0.77	0.48
S4	MAR01612.003	Sediment	2.22	1.09	0.79	1.09	1.08	0.90	0.44
S5	MAR01612.004	Sediment	1.72	0.89	0.82	0.93	0.57	0.98	0.48
S6	MAR01612.005	Sediment	1.61	0.86	0.76	0.92	1.07	0.86	0.46
S8	MAR01612.006	Sediment	1.47	0.74	0.70	0.94	0.57	0.66	0.59
S11	MAR01612.007	Sediment	0.37	0.22	0.18	0.20	0.19	0.25	0.09
S12	MAR01612.008	Sediment	0.51	0.24	0.19	0.33	0.20	0.27	0.16
S15	MAR01612.009	Sediment	0.40	0.26	0.24	0.35	0.28	0.32	0.21
Certified Reference Material QOR142 MS (Measured Value)			27.9	151	112	46.9	30.2	40.1	8.79
Certified Reference Material QOR142 MS (Certified Value)			32.8	154	113	47.5	29.8	38.0	9.18
Certified Reference Material QOR142 MS (% Recovery)			85	98	99	99	102	106	96
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

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

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
S17	MAR01612.010	Sediment	0.46	0.66	0.58	0.36	0.43	0.44	0.20
S20	MAR01612.011	Sediment	0.39	0.22	0.24	0.38	0.49	0.41	0.27
S21	MAR01612.012	Sediment	0.44	0.24	0.27	0.42	0.56	0.50	0.51
S23	MAR01612.013	Sediment	0.52	0.29	0.25	0.29	0.34	0.24	0.18
S26	MAR01612.014	Sediment	0.26	0.13	0.16	0.22	0.33	0.22	<0.08
S28	MAR01612.015	Sediment	0.39	0.21	0.22	0.32	0.31	0.31	0.19
S30	MAR01612.016	Sediment	0.29	0.15	0.17	0.24	0.24	0.21	0.13
S31	MAR01612.017	Sediment	0.34	0.21	0.16	0.27	0.29	0.27	0.15
S32	MAR01612.018	Sediment	0.53	0.26	0.24	0.32	0.19	0.33	0.24
S34	MAR01612.019	Sediment	0.52	0.31	0.23	0.33	0.37	0.38	0.28
S37	MAR01612.020	Sediment	0.26	0.14	0.15	0.15	0.19	0.19	0.09
S38	MAR01612.021	Sediment	0.30	0.16	0.15	0.15	0.21	0.20	<0.08
S39	MAR01612.022	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
S42	MAR01612.023	Sediment	0.53	0.31	0.21	0.20	0.17	0.19	0.19
S43	MAR01612.024	Sediment	0.37	0.25	0.21	0.24	0.21	0.30	0.13
CRM2	MAR01612.026	Sediment	0.32	0.44	0.41	0.33	0.45	0.45	0.12
CRM4	MAR01612.028	Sediment	3.41	4.94	4.99	4.62	4.41	5.26	3.10
Certified Reference Material QOR142 MS (Measured Value)			27	186	107	46.2	26.5	36.4	8.60
Certified Reference Material QOR142 MS (Certified Value)			33	154	113	47.5	29.8	38.0	9.18
Certified Reference Material QOR142 MS (% Recovery)			84	121	94	97	89	96	94
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

			Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
			Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
			Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
			Accreditation	UKAS	UKAS	N*	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**		**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
S1	MAR01612.001	Sediment		<0.1	<0.1	<0.1	0.33	0.13	0.95	2.91	2.87
S3	MAR01612.002	Sediment		<0.1	<0.1	<0.1	0.54	<0.1	0.84	1.29	1.78
S4	MAR01612.003	Sediment		<0.1	<0.1	<0.1	0.69	0.13	1.09	0.29	1.87
S5	MAR01612.004	Sediment		<0.1	<0.1	<0.1	0.42	0.13	0.96	0.47	1.44
S6	MAR01612.005	Sediment		<0.1	<0.1	<0.1	0.62	0.16	1.00	1.33	2.14
S8	MAR01612.006	Sediment		<0.1	<0.1	<0.1	0.67	0.12	0.95	1.38	2.21
S11	MAR01612.007	Sediment		<0.1	<0.1	<0.1	0.13	<0.1	0.39	0.50	0.65
S12	MAR01612.008	Sediment		<0.1	<0.1	<0.1	0.16	<0.1	0.41	0.52	0.71
S15	MAR01612.009	Sediment		<0.1	<0.1	<0.1	0.42	<0.1	0.26	0.92	0.42
			Certified Reference Material QOR142 MS (Measured Value)	36.2~	29.6~	0.14	0.80	2.54	2.28	0.54	1.61
			Certified Reference Material QOR142 MS (Certified Value)	40~	40~	0.12	0.74	3.17	2.60	0.50	1.66
			Certified Reference Material QOR142 MS (% Recovery)	91~	74~	113	109	80	88	109	97
			QC Blank	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
S17	MAR01612.010	Sediment	<0.1	<0.1	<0.1	0.33	<0.1	0.28	<0.1	0.96
S20	MAR01612.011	Sediment	<0.1	0.17	<0.1	0.44	<0.1	0.41	<0.1	0.93
S21	MAR01612.012	Sediment	<0.1	<0.1	<0.1	0.36	0.11	0.44	<0.1	0.68
S23	MAR01612.013	Sediment	<0.1	<0.1	<0.1	0.52	<0.1	0.43	0.18	0.89
S26	MAR01612.014	Sediment	<0.1	<0.1	<0.1	0.18	<0.1	0.29	0.11	0.44
S28	MAR01612.015	Sediment	<0.1	<0.1	<0.1	0.18	<0.1	0.35	0.16	0.47
S30	MAR01612.016	Sediment	<0.1	<0.1	<0.1	0.10	<0.1	0.32	0.21	0.37
S31	MAR01612.017	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.32	0.10	0.38
S32	MAR01612.018	Sediment	<0.1	<0.1	<0.1	0.28	<0.1	0.35	<0.1	0.68
S34	MAR01612.019	Sediment	<0.1	<0.1	<0.1	0.28	<0.1	0.34	0.40	0.34
S37	MAR01612.020	Sediment	<0.1	<0.1	<0.1	0.17	<0.1	0.27	0.11	0.37
S38	MAR01612.021	Sediment	<0.1	<0.1	<0.1	0.23	<0.1	0.33	0.60	0.66
S39	MAR01612.022	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
S42	MAR01612.023	Sediment	<0.1	<0.1	<0.1	0.26	<0.1	0.50	0.35	0.67
S43	MAR01612.024	Sediment	<0.1	<0.1	<0.1	0.65	0.12	0.41	1.12	0.53
CRM2	MAR01612.026	Sediment	<0.1	<0.1	<0.1	<0.1	0.11	0.69	0.47	0.88
CRM4	MAR01612.028	Sediment	0.13	<0.1	0.21	0.64	9.77	3.40	3.33	3.61
Certified Reference Material QOR142 MS (Measured Value)			39.9~	48.1~	0.13	0.89	2.47	2.14	0.55	1.90
Certified Reference Material QOR142 MS (Certified Value)			40~	40~	0.12	0.74	3.17	2.60	0.50	1.66
Certified Reference Material QOR142 MS (% Recovery)			100~	120~	108	121	78	82	109	114
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID MAR01612
Issue Version 1
Customer Reference Dublin Port Sediment Samples

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR01612.001-024	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR01612.001-024	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR01612.001-025	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR01612.001-025	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR01612.001-024	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR01612.004-005, .007-024	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR01612.001-009	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (GHCH) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01612.001-024, .026, .028	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01612.001-024, .026, .028	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

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

Certificate of Analysis

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

Test Report ID	MAR01612
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

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

Analyte Definitions

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

1. General Information	Applicant (company name)	Dublin Port (3FM - 24 surface samples)
	Location (port/harbour)	Dublin Port
	Dredge Quantity (tonnes)	
	Permit Application Reg. No. (to be assigned by EPA)	
2. Survey Information	Survey Company	Aquartic Services Unit (UCC)
	Sampling Date	28/09/22 and 21/10/22
	Analysing Laboratory	SOCOTEC (UK)
	Sub Contract Lab	The Testing Lab (UK) for appearance and density. Aquatic Services Unit (granulometry)
	Analysis Date	27/10/2022 (all samples). September batch frozen for organics and held at 4°C for balance of parameters. October batch held at 4°C until testing..
3. Methods Information	Fraction analysed	<2mm
	Water content of sample (reported as %)	%
	Are results reported as wet weight or dry weight?	dry weight
	Granulometry method	dry sieve after treatment with hydrogen peroxide to remove organic matter (Holmes & McIntyre)
	TEH method	Solvent extraction and clean-up followed by GC-FID analysis.
	Organic carbon (OC) method	Carbonate removal and sulphurous acid/combustion at 800°C/NDIR.
	Metals (incl. mercury & arsenic) extraction type	HF/Boric extraction
	Methods of detection (metals, incl. mercury & arsenic)	ICPS

Organics extraction types	Solvent extraction and clean-up (and derivatisation for organotins) wet sediment for TEH, organotins and PAH, air dried sediment for other organics
Methods of detection (PCBs / PAHs / TBT / DBT)	GC-FID for PAHs, GC-MS-MS for PCBs and OCPs, GC-MS for organotins

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results (2)

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID	Sample appearance (e.g. colour, texture, signs of life)
S1	Dublin Port Company	Dublin Port	21/10/2022	S1	53.34454	-6.22162	0	MAR01612.001	Greyish brown sandy SILT
S3	Dublin Port Company	Dublin Port	21/10/2022	S3	53.34419	-6.22110	0	MAR01612.002	Greyish brown slightly sandy SILT
S4	Dublin Port Company	Dublin Port	21/10/2022	S4	53.34436	-6.22043	0	MAR01612.003	Brownish grey slightly sandy SILT
S5	Dublin Port Company	Dublin Port	21/10/2022	S5	53.34409	-6.21892	0	MAR01612.004	Greyish brown sandy SILT
S6	Dublin Port Company	Dublin Port	28/09/2022	S6	53.34374	-6.21704	0	MAR01612.005	Brownish grey clayey SILT
S8	Dublin Port Company	Dublin Port	28/09/2022	S8	53.34376	-6.21617	0	MAR01612.006	Brownish grey slightly sandy SILT
S11	Dublin Port Company	Dublin Port	28/09/2022	S11	53.34259	-6.19468	0	MAR01612.007	Brownish grey sandy SILT
S12	Dublin Port Company	Dublin Port	21/10/2022	S12	53.34215	-6.19452	0	MAR01612.008	Greyish brown slightly sandy SILT
S15	Dublin Port Company	Dublin Port	28/09/2022	S15	53.34228	-6.19368	0	MAR01612.009	Greyish brown sandy SILT
S17	Dublin Port Company	Dublin Port	21/10/2022	S17	53.34167	-6.19351	0	MAR01612.010	Greyish brown slightly sandy SILT
S20	Dublin Port Company	Dublin Port	28/09/2022	S20	53.34229	-6.19308	0	MAR01612.011	Greyish brown slightly sandy SILT
S21	Dublin Port Company	Dublin Port	28/09/2022	S21	53.34200	-6.19238	0	MAR01612.012	Brownish grey slightly sandy SILT
S23	Dublin Port Company	Dublin Port	28/09/2022	S23	53.34227	-6.19034	0	MAR01612.013	Greyish brown slightly sandy SILT
S26	Dublin Port Company	Dublin Port	28/09/2022	S26	53.34225	-6.18956	0	MAR01612.014	Brownish grey silty CLAY

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results (2)

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID	Sample appearance (e.g. colour, texture, signs of life)
S28	Dublin Port Company	Dublin Port	28/09/2022	S28	53.34243	-6.18913	0	MAR01612.015	Brownish grey sandy SILT
S30	Dublin Port Company	Dublin Port	28/09/2022	S30	53.34248	-6.18743	0	MAR01612.016	Greyish brown slightly sandy SILT
S31	Dublin Port Company	Dublin Port	28/09/2022	S31	53.34223	-6.18684	0	MAR01612.017	Greyish brown slightly sandy SILT
S32	Dublin Port Company	Dublin Port	28/09/2022	S32	53.34223	-6.18615	0	MAR01612.018	Greyish brown slightly sandy SILT
S34	Dublin Port Company	Dublin Port	28/09/2022	S34	53.34222	-6.18441	0	MAR01612.019	Brownish grey silty CLAY
S37	Dublin Port Company	Dublin Port	21/10/2022	S37	53.34277	-6.18383	0	MAR01612.020	Greyish brown slightly sandy SILT
S38	Dublin Port Company	Dublin Port	28/09/2022	S38	53.34257	-6.18165	0	MAR01612.021	Brownish grey clayey SILT
S39	Dublin Port Company	Dublin Port	21/10/2022	S39	53.34194	-6.18243	0	MAR01612.022	Brownish grey sandy SILT with rare shell fragments
S42	Dublin Port Company	Dublin Port	21/10/2022	S42	53.34221	-6.17994	0	MAR01612.023	Greyish brown sandy SILT
S43	Dublin Port Company	Dublin Port	21/10/2022	S43	53.34238	-6.17861	0	MAR01612.024	Greyish brown slightly sandy SILT

<insert more rows as necessary>

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results (2)

Sample ID code	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}
S1	56.4	0.0	14.2	85.8	2.61	9.12	43.6	49500	1.12	0.25	13.4	69.3	49.5	70.3	32.5
S3	51.0	0.0	27.8	72.2	2.25	4.56	49.0	48500	1.16	0.25	14.1	65.8	47.5	71.2	33.6
S4	56.5	0.0	15.0	84.9	2.86	6.24	43.5	49900	1.45	0.26	15.9	71.9	56.5	74.6	34.2
S5	54.8	0.0	11.1	88.9	2.59	8.88	45.2	57500	1.20	0.29	14.9	68.5	49.3	59.0	31.3
S6	61.1	0.0	9.1	90.9	2.86	7.44	38.9	57900	1.19	0.27	16.3	73.0	65.0	64.7	31.4
S8	47.9	0.0	14.4	85.6	2.59	5.52	52.1	49600	1.05	0.23	12.3	65.5	59.6	54.5	28.1
S11	62.9	0.0	18.9	81.1	2.61	10.1	37.1	51000	0.71	0.16	12.9	61.2	50.4	32.6	27.9
S12	43.4	0.0	23.0	77.0	1.59	9.36	56.6	46900	0.53	0.16	9.8	53.2	31.8	31.3	23.9
S15	45.3	0.0	30.7	69.3	1.96	9.12	54.7	48700	0.57	0.15	10.6	57.5	42.4	31.4	23.4
S17	44.4	0.1	31.2	68.7	1.69	8.16	55.6	41200	0.51	0.22	8.9	55.9	36.0	33.3	20.1
S20	54.2	0.0	29.3	70.7	1.94	5.52	45.8	45400	0.58	0.15	9.9	60.2	39.8	32.9	24.1
S21	48.9	0.0	20.6	79.4	2.15	6.96	51.1	51500	0.61	0.17	11.5	64.4	44.3	38.2	27.1
S23	46.9	0.0	27.2	72.8	1.77	7.44	53.1	47900	0.51	0.14	9.7	60.4	35.1	34.1	27.5
S26	63.3	0.0	11.0	89.0	3.16	6.72	36.7	52300	0.76	0.19	15.1	67.7	67.1	37.6	31.3

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results (2)

Sample ID code	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}
S28	54.0	0.0	38.1	61.9	2.22	10.8	46.0	57800	0.53	0.17	11.7	69.4	43.4	43.1	31.6
S30	57.9	0.0	15.9	84.1	2.31	6.00	42.1	50200	0.56	0.14	11.0	67.9	47.1	34.5	27.6
S31	68.8	0.0	10.0	90.0	3.65	9.60	31.2	52100	0.72	0.18	14.3	70.9	68.3	39.4	31.5
S32	53.9	0.0	10.5	89.5	2.41	10.1	46.1	58700	0.71	0.18	14.1	74.2	55.3	45.9	33.5
S34	73.4	0.0	8.7	91.3	3.97	9.84	26.6	52900	0.84	0.20	16.8	68.9	84.0	42.4	31.1
S37	65.0	0.0	81.7	18.3	1.98	3.60	35.0	35200	0.47	0.17	7.0	43.5	36.1	29.1	22.3
S38	43.7	0.6	39.4	59.9	1.43	9.36	56.3	44300	0.48	0.14	7.8	53.4	27.2	32.2	26.3
S39	30.5	0.8	94.3	4.9	0.25	9.84	69.5	25700	0.16	0.22	4.7	36.6	11.1	24.4	14.3
S42	46.8	0.0	75.8	24.2	1.66	9.12	53.2	30700	0.38	0.22	7.6	41.7	36.6	38.4	18.4
S43	65.7	0.0	25.9	74.1	4.32	9.36	34.3	39400	0.69	0.25	14.2	55.8	100	38.3	24.0

<insert more rows as necessary>

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results (2)

Sample ID code	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	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}
S1	222	0.586	0.130	<0.1	2.91	2.87	0.95	6.73	0.0158	<0.005	1.6000	0.8400	0.6700	0.9000	0.7200
S3	245	0.517	<0.1	<0.1	1.29	1.78	0.84	3.91	0.0122	0.0107	2.2400	1.0700	0.7500	0.9500	0.7700
S4	265	0.632	0.130	<0.1	0.29	1.87	1.09	3.25	0.0237	0.0121	2.2200	1.0900	0.7900	1.0800	0.9000
S5	226	0.657	0.130	<0.1	0.47	1.44	0.96	2.87	<0.005	<0.005	1.7200	0.8900	0.8200	0.5700	0.9800
S6	252	0.679	0.160	<0.1	1.33	2.14	1	4.47	0.0486	<0.005	1.6100	0.8600	0.7600	1.0700	0.8600
S8	210	0.671	0.120	<0.1	1.38	2.21	0.95	4.54	0.0409	0.0194	1.4700	0.7400	0.7000	0.5700	0.6600
S11	139	0.809	<0.1	<0.1	0.5	0.65	0.39	1.54	<0.005	<0.005	0.3700	0.2200	0.1800	0.1900	0.2500
S12	107	0.334	<0.1	<0.1	0.52	0.71	0.41	1.64	<0.005	<0.005	0.5100	0.2400	0.1900	0.2000	0.2700
S15	121	0.378	<0.1	<0.1	0.92	0.42	0.26	1.6	<0.005	<0.005	0.4000	0.2600	0.2400	0.2800	0.3200
S17	123	0.293	<0.1	<0.1	<0.1	0.96	0.28	≥1.24	<0.005	<0.005	0.4600	0.6600	0.5800	0.4300	0.4400
S20	118	0.484	<0.1	<0.1	<0.1	0.93	0.41	≥1.34	<0.005	<0.005	0.3900	0.2200	0.2400	0.4900	0.4100
S21	138	0.403	0.110	<0.1	<0.1	0.68	0.44	≥1.12	<0.005	<0.005	0.4400	0.2400	0.2700	0.5600	0.5000
S23	114	0.275	<0.1	<0.1	0.18	0.89	0.43	1.5	<0.005	<0.005	0.5200	0.2900	0.2500	0.3400	0.2400
S26	167	0.660	<0.1	<0.1	0.11	0.44	0.29	0.84	<0.005	<0.005	0.2600	0.1300	0.1600	0.3300	0.2200

Sample ID code	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	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}
S28	134	0.417	<0.1	<0.1	0.16	0.47	0.35	0.98	<0.005	<0.005	0.3900	0.2100	0.2200	0.3100	0.3100
S30	135	0.513	<0.1	<0.1	0.21	0.37	0.32	0.9	<0.005	<0.005	0.2900	0.1500	0.1700	0.2400	0.2100
S31	174	0.738	<0.1	<0.1	0.1	0.38	0.32	0.8	<0.005	<0.005	0.3400	0.2100	0.1600	0.2900	0.2700
S32	159	0.443	<0.1	<0.1	<0.1	0.68	0.35	≥1.03	<0.005	<0.005	0.5300	0.2600	0.2400	0.1900	0.3300
S34	187	1.220	<0.1	<0.1	0.4	0.34	0.34	1.08	<0.005	<0.005	0.5200	0.3100	0.2300	0.3700	0.3800
S37	104	0.755	<0.1	<0.1	0.11	0.37	0.27	0.75	<0.005	<0.005	0.2600	0.1400	0.1500	0.1900	0.1900
S38	96.5	0.327	<0.1	<0.1	0.6	0.66	0.33	1.59	<0.005	<0.005	0.3000	0.1600	0.1500	0.2100	0.2000
S39	43.7	0.085	<0.1	<0.1	<0.1	<0.1	<0.1	≤0.1	<0.005	<0.005	<0.08	<0.08	<0.08	<0.08	<0.08
S42	103	0.536	<0.1	<0.1	0.35	0.67	0.5	1.52	<0.005	0.0101	0.5300	0.3100	0.2100	0.1700	0.1900
S43	191	0.871	0.120	<0.1	1.12	0.53	0.41	2.06	<0.005	<0.005	0.3700	0.2500	0.2100	0.2100	0.3000

<insert more rows as necessary>

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene ug kg^{-1}	PAH Naphthalene ug kg^{-1}
S1	0.4100	0.9000	16.7	66.6	88.4	220.0	350.0	287.0	255.0	296.0	229.0	48.9	288.0	44.1	238.0	50.4
S3	0.4800	0.8300	21.0	43.2	78.6	222.0	338.0	306.0	276.0	288.0	228.0	41.7	387.0	45.6	243.0	47.1
S4	0.4400	1.0900	30.7	73.8	140.0	455.0	635.0	515.0	412.0	492.0	476.0	84.2	752.0	72.5	410.0	62.8
S5	0.4800	0.9300	27.6	75.3	99.6	435.0	629.0	516.0	417.0	499.0	467.0	86.5	599.0	63.6	411.0	62.5
S6	0.4600	0.9200	18.1	64.8	112.0	270.0	384.0	320.0	266.0	299.0	271.0	56.0	385.0	58.0	268.0	56.6
S8	0.5900	0.9400	16.1	51.2	70.6	198.0	308.0	264.0	232.0	252.0	216.0	47.7	258.0	49.7	227.0	54.9
S11	0.0900	0.2000	8.4	15.2	22.6	52.9	80.8	82.0	77.7	72.2	68.5	15.7	72.3	21.0	77.1	27.9
S12	0.1600	0.3300	11.3	26.4	41.7	124.0	155.0	136.0	121.0	139.0	135.0	26.4	204.0	25.2	122.0	33.1
S15	0.2100	0.3500	13.5	18.9	47.8	120.0	158.0	144.0	115.0	127.0	138.0	25.4	199.0	25.2	114.0	28.2
S17	0.2000	0.3600	34.9	34.7	115.0	137.0	190.0	157.0	122.0	154.0	153.0	24.1	50.5	282.0	119.0	66.8
S20	0.2700	0.3800	17.9	29.6	37.3	109.0	167.0	136.0	120.0	143.0	125.0	22.7	27.4	162.0	117.0	35.2
S21	0.5100	0.4200	16.1	27.8	37.3	91.0	134.0	120.0	103.0	110.0	104.0	19.5	31.1	139.0	105.0	53.8
S23	0.1800	0.2900	6.8	19.2	25.5	60.5	84.0	74.3	66.0	75.6	67.4	12.0	19.5	78.3	65.0	26.4
S26	<0.08	0.2200	7.7	18.4	25.8	61.2	87.4	86.1	82.2	101.0	76.9	16.0	19.0	91.4	80.7	25.4

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene ug kg^{-1}	PAH Naphthalene ug kg^{-1}
S28	0.1900	0.3200	7.6	15.3	18.7	53.7	77.5	88.7	76.3	74.1	71.0	14.7	19.2	82.5	76.5	26.0
S30	0.1300	0.2400	6.3	14.9	19.8	55.8	84.0	82.7	72.3	69.9	72.8	15.3	16.8	86.4	69.9	24.1
S31	0.1500	0.2700	10.7	13.6	29.6	86.0	111.0	113.0	100.0	88.6	105.0	19.4	23.3	147.0	102.0	47.4
S32	0.2400	0.3200	11.9	30.0	40.6	118.0	160.0	146.0	122.0	138.0	138.0	26.1	30.8	152.0	128.0	34.0
S34	0.2800	0.3300	12.0	32.0	31.6	92.1	150.0	140.0	138.0	134.0	123.0	27.1	32.7	132.0	142.0	45.1
S37	0.0900	0.1500	11.5	24.5	34.5	84.5	136.0	112.0	101.0	118.0	93.3	20.4	27.4	106.0	101.0	42.6
S38	<0.08	0.1500	7.2	23.4	31.2	94.6	125.0	123.0	99.9	113.0	104.0	20.1	24.0	138.0	103.0	25.8
S39	<0.08	<0.08	1.8	10.5	10.5	28.9	40.0	32.0	24.8	35.3	31.6	6.0	6.6	36.5	25.9	8.5
S42	0.1900	0.2000	29.1	49.8	128.0	305.0	397.0	289.0	223.0	314.0	328.0	44.3	70.5	495.0	223.0	55.5
S43	0.1300	0.2400	41.6	20.8	48.7	176.0	214.0	188.0	145.0	181.0	212.0	29.4	35.0	434.0	140.0	26.4

<insert more rows as necessary>

Sample ID code	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}												
S1	140.0	378.0												
S3	185.0	493.0												
S4	336.0	839.0												
S5	221.0	722.0												
S6	206.0	436.0												
S8	136.0	349.0												
S11	59.3	105.0												
S12	103.0	225.0												
S15	119.0	217.0												
S17	182.0	389.0												
S20	111.0	183.0												
S21	101.0	166.0												
S23	55.4	116.0												
S26	66.8	114.0												

Sample ID code	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}												
S28	60.9	95.0												
S30	65.7	101.0												
S31	92.4	168.0												
S32	93.0	220.0												
S34	93.3	166.0												
S37	74.9	164.0												
S38	63.6	160.0												
S39	17.6	69.5												
S42	292.0	659.0												
S43	316.0	451.0												

<insert more rows as necessary>

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured				34.1	140	0.23	0.15	27.4	20	93.7	40	90.3	95600
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value				32.9 (+/-1.8)	147 (+/-6)	0.28 (+/-0.04)	0.08 (+/-0.06)	21.5 (+/-1.2)	21.7 (+/-2.8)	94.3 (+/-1.8)	42.8 (+/-1.6)	65.3 (+/-6.8)	79100 +/- (2000)
CRM IAEA159 (measured value)													
CRM IAEA159 (certified value)													
CRM NIST 1941b (measured value)													
CRM NIST 1941b (certified value)													

Reference Type	DBT mg kg^{-1}	TBT 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}	PCB 180 ug kg^{-1}	PCB 118 ug kg^{-1}	PAH Acenaphthene ug kg^{-1}	PAH Acenaphthylene ug kg^{-1}
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured	0.301	0.246									
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value	0.445 (+/-0.025)	0.343 (+/-0.019)									
CRM IAEA159 (measured value)			0.32	0.44	0.41	0.45	0.45	0.12	0.33	4.77	6.77
CRM IAEA159 (certified value)			0.57 (+/-0.28)	0.67 (+/-0.25)	0.52 (+/-0.16)	0.6 (+/-0.31)	0.56 (+/-0.09)	0.26 (+/-0.1)	0.52 (+/-0.21)	6(+/-4)	6.4(+/-5.4)
CRM NIST 1941b (measured value)			3.41	4.94	4.99	4.41	5.26	3.1	4.62		
CRM NIST 1941b (certified value)			4.52 (+/-0.57)	5.24 (+/-0.28)	5.11 (+/-0.34)	3.6 (+/-0.28)	5.47 (+/-0.32)	3.24 (+/-51)	4.23 (+/-0.19)		

Reference Type	PAH Anthracene ug kg^{-1}	PAH Benzo (a) anthracene ug kg^{-1}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured										
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value										
CRM IAEA159 (measured value)	10.9	43.8	61.7	97.8	104	41.8	61.4	15.6	10.3	91
CRM IAEA159 (certified value)	11(+/-5.1)	54(+/-20)	58(+/-26)	100(+/-42)	95(+/-45)	49(+/-14)	58(+/-26)	25(+/-14)	13(+/-7.7)	110(+/-32)
CRM NIST 1941b (measured value)	116	218	217	377	213	170	325	53.6	49.9	499
CRM NIST 1941b (certified value)	184 (+/-18)	335(+/-25)	358(+/-17)	453(+/-21)	307(+/-45)	225(+/-18)	291(+/-31)	53(+/-10)	85(+/-15)	651(+/-50)

Reference Type	PAH Indeno (1,2,3–cd) pyrene	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured									
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value									
CRM IAEA159 (measured value)	106	32.1	67.9	88.6	0.11	<0.1	0.47	0.88	0.69
CRM IAEA159 (certified value)	120(+/-34)	23(+/-13)	59(+/-29)	100(+/-38)	0.17 (+/- 0.15)	0.21 (+/- 0.18)	0.71(+/- 0.69)	0.82 (+/-0.58	0.89 (+/- 0.50)
CRM NIST 1941b (measured value)	250	498	318	401	9.77			3.61	3.4
CRM NIST 1941b (certified value)	341(+/-57)	848(+/-95)	406(+/-44)	581(+/-39)	5.83 (+/- 0.38)			4.66 (+/-0.46)	3.22 (+/- 0.28)

Certificate of Analysis

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

Test Report ID	**MAR01739**
Issue Version	1
Customer	Hydromaster, 7 Howley Court, Dublin Road, Oranmore, Co. Galway
Customer Reference	2301_DP_GS_03
Date Sampled	09-Feb-23
Date Received	22-Feb-23
Date Reported	27-Mar-23
Condition of samples	Cold Satisfactory

Authorised by:	Marya Hubbard
Position:	Laboratory Manager

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

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Method No	SUB_02*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Visual Description**
DP_3FM_S35	MAR01739.001	Sediment	Dark grey organic SILT.

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	%	%	%	%	%	Mg/m3
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Particle Density**
DP_3FM_S35	MAR01739.001	Sediment	62.7	37.3	0.00	52.18	47.82	2.51
		Reference Material (% Recovery)	NA	NA	NA	NA	NA	NA
		QC Blank	NA	NA	NA	NA	NA	NA

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	% m/m	%m/m
		Method No	WSLM59*	ANC*
		Limit of Detection	0.02	0.12
		Accreditation	UKAS	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**TOC**	**Carbonate Equivalent (%CO3)**
DP_3FM_S35	MAR01739.001	Sediment	4.70	7.0
		Reference Material (% Recovery)	101	100
		QC Blank	<0.02	<0.12

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
DP_3FM_S35	MAR01739.001	Sediment	13.6	0.66	74.3	69.4	43.7	0.17	32
Certified Reference Material 2702 (Measured Value)			45.88	1.002	299.3	107.5	121.6	0.451	67.46
Certified Reference Material 2702 (Certified Value)			45.3	0.817	352	117.7	132.8	0.447	75.4
Certified Reference Material 2702 (% Recovery)			107	129	103	106	96	98	105
QC Blank			<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
DP_3FM_S35	MAR01739.001	Sediment	193	48500	66.0
		Certified Reference Material 2702 (Measured Value)	452.1	92165	102.15
		Certified Reference Material 2702 (Certified Value)	485.3	84000	78.2
		Certified Reference Material 2702 (% Recovery)	112	98	104
		QC Blank	<3.5	<1750	<2

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
DP_3FM_S35	MAR01739.001	Sediment	<5	<5
Certified Reference Material BCR-646 (Measured Value)			521	341
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			68	71
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
DP_3FM_S35	MAR01739.001	Sediment	<5	29.2	31.5	111	127	130
Certified Reference Material Nist 1941b (Measured Value)			33.2	59.6	119	219	215	424
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			86	112	65	65	60	94
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	N*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
DP_3FM_S35	MAR01739.001	Sediment	107	125	136	21.4	173	32.9
Certified Reference Material Nist 1941b (Measured Value)			212	351	344	56.2	553	46.2
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			69	156	86	106	85	54
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
DP_3FM_S35	MAR01739.001	Sediment	109	37.0	105	224	905000
		Certified Reference Material Nist 1941b (Measured Value)	237	534	320	431	1346
		Certified Reference Material Nist 1941b (Certified Value)	341	848	406	581	1400
		Certified Reference Material Nist 1941b (% Recovery)	70	63	79	74	96
		QC Blank	<1	<1	<1	<1	<100

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	N*	UKAS	UKAS	UKAS	UKAS	N*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
DP_3FM_S35	MAR01739.001	Sediment	1.04	0.74	0.45	0.63	0.56	0.59	0.45
Certified Reference Material Nist 1941b (Measured Value)			3.27	4.45	5.33	4.14	3.70	5.41	3.44
Certified Reference Material Nist 1941b (Certified Value)			4.52	5.24	5.11	4.23	3.60	5.47	3.24
Certified Reference Material Nist 1941b (% Recovery)			72	85	104	98	103	99	106
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
DP_3FM_S35	MAR01739.001	Sediment	<0.1	<0.1	<0.1	1.32	0.11	0.83	0.12	1.69
Certified Reference Material Nist 1941b (Measured Value)			44~	43~	49~	44~	6.89	3.16	0.55	4.54
Certified Reference Material Nist 1941b (Certified Value)			40~	40~	40~	40~	5.83	3.22	1.12	4.66
Certified Reference Material Nist 1941b (% Recovery)			110	109	122	109	118	98	50	97
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID MAR01739
Issue Version 1
Customer Reference 2301_DP_GS_03

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR01739.001	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR01739.001	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR01739.001	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR01739.001	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR01739.001	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR01739.001	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR01739.001	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR01739.001	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (PCB52, PCB180) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01739.001	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (FLUORENE) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01739.001	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01739.001	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

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

Certificate of Analysis

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

Test Report ID	MAR01739
Issue Version	1
Customer Reference	2301_DP_GS_03

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

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

1. General Information	Applicant (company name)	
	Location (port/harbour)	
	Dredge Quantity (tonnes)	
	Permit Application Reg. No. (to be assigned by EPA)	
2. Survey Information	Survey Company	
	Sampling Date	
	Analysing Laboratory	SOCOTEC
	Sub Contract Lab	
	Analysis Date	
3. Methods Information	Fraction analysed	<2mm
	Water content of sample (reported as %)	
	Are results reported as wet weight or dry weight?	Dry Weight
	Granulometry method	Wet and dry sieving followed by laser diffraction analysis.
	TEH method	Solvent extraction and GCFID
	Organic carbon (OC) method	High temperature combustion and IR detection
	Metals (incl. mercury & arsenic) extraction type	Hydrofluoric acid
	Methods of detection (metals, incl. mercury & arsenic)	ICPMS & ICPOES
	Organics extraction types	Solvent extraction
	Methods of detection (PCBs / PAHs / TBT / DBT)	GCMS & GCMSMS

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID	Sample appearance (e.g. colour, texture, signs of life)
MAR01739.001	SOCOTEC UK	Dublin Port	09/02/2023	DP_3FM_S35	53.34223	6.18247	surface	MAR01739	Dark grey organic SILT.

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}
MAR01739.001	62.7	0	52.18	47.82	4.7	6.96	37.3	48500	0.66	0.17	13.6	74.3	69.4	43.7	32

Sample ID code	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}

Sample ID code	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	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}
MAR01739.001	193	905000	0.11	<0.1	0.12	1.69	0.83		<0.005	<0.005	1.0400	0.7400	0.4500	0.5600	0.5900

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene ug kg^{-1}	PAH Naphthalene ug kg^{-1}
MAR01739.001	0.4500	0.6300	<5	29.20	31.50	111.00	127.00	130.00	107.00	125.00	136.00	21.40	32.90	173.00	109.00	37.00

Sample ID code	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}												
MAR01739.001	105.00	224.00												

Sample ID code					
MAR01739.001					

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}	DBT mg kg^{-1}	TBT mg kg^{-1}
CRM (measured value)	2702			107.5	452.1	1.002	0.451	121.6	45.88	299.3	67.46	102.15	92165		
CRM (certified value)	2702			117.7	485.3	0.817	0.447	132.8	45.3	352	75.4	78.2	84000		
CRM (measured value)	BCR-646													521	341
CRM (certified value)	BCR-646													770	480
CRM (measured value)	Nist 1941b														
CRM (certified value)	Nist 1941b														
CRM (measured value)															
CRM (certified value)															

Reference Type	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}	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}	PAH Benzo (b) fluoranthene ug kg^{-1}
CRM (measured value)													
CRM (certified value)													
CRM (measured value)													
CRM (certified value)													
CRM (measured value)	3.27	4.45	5.33	3.7	5.41	3.44	4.14	33.2	59.6	119	219	215	424
CRM (certified value)	4.52	5.24	5.11	3.6	5.47	3.24	4.23	38.4	53.3	184	335	358	453
CRM (measured value)													
CRM (certified value)													

Reference Type	PAH Benzo (ghi) perylene ug kg^{-1}	PAH Benzo (k) fluoranthene ug kg^{-1}	PAH Chrysene ug kg^{-1}	PAH Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}	HCB (ug kg-1)
CRM (measured value)											
CRM (certified value)											
CRM (measured value)											
CRM (certified value)											
CRM (measured value)	212	351	344	56.2	46.2	553	237	534	320	431	6.89
CRM (certified value)	307	225	399	53	85	651	341	848	406	581	5.83
CRM (measured value)											
CRM (certified value)											

Reference Type	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	Please add columns here for additional		
CRM (measured value)								
CRM (certified value)								
CRM (measured value)								
CRM (certified value)								
CRM (measured value)		0.55	4.54	3.16				
CRM (certified value)		1.12	4.66	3.22				
CRM (measured value)								
CRM (certified value)								

Vibrocores Samples

- Laboratory Results
- Results presented in EPA Format

Certificate of Analysis

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

Test Report ID	**MAR01700**	
Issue Version	1	
Customer	Aquatic Services Unit, Environmental Research Institute, Lee Road, Cork, Ireland	
Customer Reference	Dublin Port Sediment Samples	
Date Sampled	18-Jan-23	
Date Received	26-Jan-23	
Date Reported	16-Feb-23	
Condition of samples	Ambient	Satisfactory

Authorised by:	Marya Hubbard
Position:	Laboratory Manager

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

Certificate of Analysis

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

Test Report ID	MAR01700
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	%	%	%	%	%	% m/m
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	WSLM59*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	0.02
		Accreditation	UKAS	UKAS	N	N	N	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**TOC**
2	MAR01700.001	Sediment	55.0	45.0	0.00	22.75	77.25	2.73
7	MAR01700.002	Sediment	44.3	55.7	0.00	15.84	84.16	2.52
14	MAR01700.003	Sediment	35.4	64.6	0.00	32.05	67.95	1.49
16	MAR01700.004	Sediment	37.1	62.9	0.00	21.08	78.92	2.24
18	MAR01700.005	Sediment	42.5	57.5	0.00	36.84	63.16	2.84
19	MAR01700.006	Sediment	39.7	60.3	0.00	21.26	78.74	1.60
22	MAR01700.007	Sediment	40.0	60.0	0.00	25.70	74.30	1.83
25	MAR01700.008	Sediment	44.6	55.4	0.00	28.56	71.44	2.01
27	MAR01700.009	Sediment	47.4	52.6	0.00	17.19	82.81	1.72
29	MAR01700.010	Sediment	43.8	56.2	0.00	19.01	80.99	2.31
33	MAR01700.011	Sediment	44.5	55.5	0.00	19.93	80.07	1.89
36	MAR01700.012	Sediment	52.9	47.1	0.00	61.34	38.66	2.61
41	MAR01700.013	Sediment	16.6	83.4	0.00	2.96	97.04	0.92
44	MAR01700.014	Sediment	48.2	51.8	0.00	10.67	89.33	2.06
		Reference Material (% Recovery)	NA	NA	NA	NA	NA	104
		QC Blank	NA	NA	NA	NA	NA	<0.02

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01700
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	%m/m
		Method No	ANC*
		Limit of Detection	0.12
		Accreditation	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Carbonate Equivalent (%CO3)**
2	MAR01700.001	Sediment	7.44
7	MAR01700.002	Sediment	8.88
14	MAR01700.003	Sediment	8.16
16	MAR01700.004	Sediment	7.68
18	MAR01700.005	Sediment	5.28
19	MAR01700.006	Sediment	6.24
22	MAR01700.007	Sediment	4.32
25	MAR01700.008	Sediment	8.16
27	MAR01700.009	Sediment	7.92
29	MAR01700.010	Sediment	4.56
33	MAR01700.011	Sediment	7.44
36	MAR01700.012	Sediment	10.3
41	MAR01700.013	Sediment	11.0
44	MAR01700.014	Sediment	7.44
		Reference Material (% Recovery)	98
		QC Blank	<0.12

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01700
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
2	MAR01700.001	Sediment	12.3	0.95	56.5	40.6	49.4	0.17	25.7
7	MAR01700.002	Sediment	12.9	1.14	56.4	42.7	64.2	0.22	29.0
14	MAR01700.003	Sediment	7.3	0.26	43.7	17.5	24.1	0.07	18.7
16	MAR01700.004	Sediment	8.6	0.61	56.0	33.8	53.0	0.21	25.9
18	MAR01700.005	Sediment	13.3	0.85	46.6	32.1	59.0	0.47	28.1
19	MAR01700.006	Sediment	8.7	0.44	51.6	29.5	39.8	0.12	27.0
22	MAR01700.007	Sediment	7.6	0.46	50.6	25.9	32.8	0.11	20.1
25	MAR01700.008	Sediment	12.1	0.32	60.1	23.4	36.2	0.09	28.0
27	MAR01700.009	Sediment	10.6	0.48	63.6	26.9	43.9	0.14	27.0
29	MAR01700.010	Sediment	11.2	0.75	65.0	40.7	60.2	0.26	33.3
33	MAR01700.011	Sediment	10.2	0.35	62.0	35.2	33.4	0.09	24.7
36	MAR01700.012	Sediment	7.8	0.47	44.9	36.1	26.1	0.11	22.0
41	MAR01700.013	Sediment	7.8	1.95	50.0	27.0	21.0	0.06	51.9
44	MAR01700.014	Sediment	10.0	0.40	64.3	26.4	43.7	0.12	29.4
CRM 1	MAR01700.015	Sediment	20.0	0.30	84.1	29.8	22.0	0.11	40.2
		Certified Reference Material 2702 (Measured Value)	42.6	0.666	276	96.3	121	0.347	61.8
		Certified Reference Material 2702 (Certified Value)	45.3	0.817	352	117.7	132.8	0.447	75.4
		Certified Reference Material 2702 (% Recovery)	99	86	95	94	96	81	97
		QC Blank	<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01700
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
2	MAR01700.001	Sediment	177	53400	61.2
7	MAR01700.002	Sediment	207	52600	60.9
14	MAR01700.003	Sediment	74.5	47300	52.5
16	MAR01700.004	Sediment	153	51100	57.6
18	MAR01700.005	Sediment	84.5	51800	75.5
19	MAR01700.006	Sediment	106	48300	53.0
22	MAR01700.007	Sediment	102	46100	50.0
25	MAR01700.008	Sediment	105	62600	71.6
27	MAR01700.009	Sediment	114	55300	63.1
29	MAR01700.010	Sediment	149	55900	63.1
33	MAR01700.011	Sediment	108	55200	62.8
36	MAR01700.012	Sediment	97.7	40600	45.2
41	MAR01700.013	Sediment	92.0	44400	37.4
44	MAR01700.014	Sediment	118	62400	72.4
CRM 1	MAR01700.015	Sediment	132	80200	75.9
		Certified Reference Material 2702 (Measured Value)	386	90572	104
		Certified Reference Material 2702 (Certified Value)	485.3	84000	78.2
		Certified Reference Material 2702 (% Recovery)	96	102	98
		QC Blank	<3.5	<1750	<2

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01700
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
2	MAR01700.001	Sediment	<5	24.7
7	MAR01700.002	Sediment	16.2	16.9
14	MAR01700.003	Sediment	<5	<5
16	MAR01700.004	Sediment	34.0	106
18	MAR01700.005	Sediment	<5	<5
19	MAR01700.006	Sediment	<5	<5
22	MAR01700.007	Sediment	<5	<5
25	MAR01700.008	Sediment	<5	<5
27	MAR01700.009	Sediment	17.4	29.1
Certified Reference Material BCR-646 (Measured Value)			399	285
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			52	59
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
29	MAR01700.010	Sediment	<5	21.2
33	MAR01700.011	Sediment	20.4	<5
36	MAR01700.012	Sediment	<5	<5
41	MAR01700.013	Sediment	<5	<5
44	MAR01700.014	Sediment	<5	<5
CRM3	MAR01700.017	Sediment	236	257
Certified Reference Material BCR-646 (Measured Value)			340	261
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			44	54
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
2	MAR01700.001	Sediment	68.9	123	197	534	784	631
7	MAR01700.002	Sediment	28.6	112	145	364	567	445
14	MAR01700.003	Sediment	15.1	29.3	57.1	118	176	156
16	MAR01700.004	Sediment	159	93.7	278	440	507	402
18	MAR01700.005	Sediment	19.6	12.4	61.4	122	117	112
19	MAR01700.006	Sediment	17.9	37.3	66.5	199	253	230
22	MAR01700.007	Sediment	52.8	48.5	91.8	213	293	239
25	MAR01700.008	Sediment	9.93	31.4	36.1	98.3	148	154
Certified Reference Material QPH109MS (Measured Value)			2.36	3.63	5.72	19.8	25.5	56.7
Certified Reference Material QPH109MS (Certified Value)			2.86	2.54	6.45	22.3	29.2	74.9
Certified Reference Material QPH109MS (% Recovery)			83	143	89	89	87	76
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	N*	N*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
2	MAR01700.001	Sediment	546	614	538	121	924	115
7	MAR01700.002	Sediment	409	429	381	91.0	504	89.1
14	MAR01700.003	Sediment	135	150	130	30.7	161	36.6
16	MAR01700.004	Sediment	343	398	484	79.3	768	271
18	MAR01700.005	Sediment	97	114	140	19.7	162	65.1
19	MAR01700.006	Sediment	187	216	219	38.9	336	40.9
22	MAR01700.007	Sediment	198	238	216	42.9	349	76.9
25	MAR01700.008	Sediment	127	134	130	26.3	148	34.3
Certified Reference Material QPH109MS (Measured Value)			66.8	47.0	30.7	12.1	46.8	7.36
Certified Reference Material QPH109MS (Certified Value)			61.8	27.7	33.7	12.9	47.7	6.36
Certified Reference Material QPH109MS (% Recovery)			108	85	91	94	98	116
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
2	MAR01700.001	Sediment	577	80.7	373	978	648000
7	MAR01700.002	Sediment	418	84.0	198	637	675000
14	MAR01700.003	Sediment	142	48.8	102	213	273000
16	MAR01700.004	Sediment	363	123	310	905	1010000
18	MAR01700.005	Sediment	75.8	39.7	187	179	321000
19	MAR01700.006	Sediment	199	39.5	128	350	303000
22	MAR01700.007	Sediment	200	67.1	238	416	364000
25	MAR01700.008	Sediment	134	35.9	94.7	163	372000
Certified Reference Material QPH109MS (Measured Value)			75.2	18.0	75.4	42.4	1440~
Certified Reference Material QPH109MS (Certified Value)			73.2	17.0	47.3	42.2	1400~
Certified Reference Material QPH109MS (% Recovery)			103	106	159	101	103~
QC Blank			<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
27	MAR01700.009	Sediment	35.1	38.6	78.9	202	247	259
29	MAR01700.010	Sediment	450	482	1150	1930	2040	1470
33	MAR01700.011	Sediment	17.3	33.1	55.3	131	171	173
36	MAR01700.012	Sediment	<5	29.6	41.0	108	133	102
41	MAR01700.013	Sediment	6.58	<5	<5	<5	<5	22.5
44	MAR01700.014	Sediment	18.5	15.5	40.0	138	164	210
CRM2	MAR01700.016	Sediment	12.1	6.81	16.2	54.9	62.7	108
CRM4	MAR01700.018	Sediment	26.7	62.0	128	243	244	420
Certified Reference Material NIST 1941b (Measured Value)			33.9	54.9	120	230	214	389
Certified Reference Material NIST 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material NIST 1941b (% Recovery)			88	103	65	69	60	86
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
27	MAR01700.009	Sediment	223	247	249	47.4	330	64.7
29	MAR01700.010	Sediment	1330	1540	2050	268	3380	728
33	MAR01700.011	Sediment	146	163	160	35.3	209	44.1
36	MAR01700.012	Sediment	85.8	111	119	21.3	133	25.4
41	MAR01700.013	Sediment	15.4	<5	50.2	<5	8.03	23.5
44	MAR01700.014	Sediment	174	190	190	36.8	278	44.0
CRM2	MAR01700.016	Sediment	109	44.5	75.9	20.4	116	13.0
CRM4	MAR01700.018	Sediment	197	180	377	65.5	540	45.3
Certified Reference Material NIST 1941b (Measured Value)			197	357	364	63.3	549	47.4
Certified Reference Material NIST 1941b (Certified Value)			307	442	399	53.0	651	85.0
Certified Reference Material NIST 1941b (% Recovery)			64	81	91	120	84	56
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
27	MAR01700.009	Sediment	232	55.7	238	370	701000
29	MAR01700.010	Sediment	1340	336	3460	4170	3220000
33	MAR01700.011	Sediment	157	38.0	150	249	519000
36	MAR01700.012	Sediment	91.8	23.6	72.5	196	921000
41	MAR01700.013	Sediment	<5	11.0	67.4	18.6	32900
44	MAR01700.014	Sediment	188	53.4	175	252	559000
CRM2	MAR01700.016	Sediment	114	28.4	76.5	104	NA
CRM4	MAR01700.018	Sediment	281	487	321	435	NA
Certified Reference Material NIST 1941b (Measured Value)			269	469	317	429	1280~
Certified Reference Material NIST 1941b (Certified Value)			341	848	406	581	1400~
Certified Reference Material NIST 1941b (% Recovery)			79	55	78	74	91~
QC Blank			<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
2	MAR01700.001	Sediment	1.56	0.95	0.82	0.85	0.99	0.87	0.51
7	MAR01700.002	Sediment	2.09	1.17	0.90	1.19	0.83	1.02	0.58
14	MAR01700.003	Sediment	0.38	0.21	0.19	0.28	0.16	0.18	<0.08
16	MAR01700.004	Sediment	1.64	0.90	0.76	1.02	0.81	0.95	0.50
18	MAR01700.005	Sediment	0.19	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
19	MAR01700.006	Sediment	0.70	0.63	0.40	0.50	0.41	0.40	0.26
22	MAR01700.007	Sediment	0.81	0.51	0.48	0.65	0.55	0.76	0.44
25	MAR01700.008	Sediment	0.48	0.28	0.29	0.44	0.31	0.46	0.23
27	MAR01700.009	Sediment	0.94	0.44	0.74	0.71	2.27	2.61	2.27
29	MAR01700.010	Sediment	2.84	1.57	1.15	1.47	1.11	1.54	1.02
33	MAR01700.011	Sediment	0.48	0.32	<0.08	0.37	0.33	0.44	0.18
36	MAR01700.012	Sediment	0.81	0.44	0.24	0.36	0.31	0.25	0.24
41	MAR01700.013	Sediment	0.22	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
44	MAR01700.014	Sediment	0.94	0.49	0.52	0.74	0.77	0.74	0.33
CRM2	MAR01700.016	Sediment	0.29	0.46	0.42	0.35	0.46	0.50	0.17
CRM4	MAR01700.018	Sediment	2.93	4.23	4.19	3.92	3.55	5.21	2.99
Certified Reference Material QOR150MS (Measured Value)			0.13	0.12	0.24	0.21	0.34	0.32	0.15
Certified Reference Material QOR150MS (Certified Value)			0.14	0.16	0.27	0.17	0.34	0.37	0.18
Certified Reference Material QOR150MS (% Recovery)			84	121	94	97	89	96	94
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

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

Certificate of Analysis

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

Test Report ID	MAR01700
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	N*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
2	MAR01700.001	Sediment	<0.1	<0.1	<0.1	0.54	0.11	0.83	0.54	1.80
7	MAR01700.002	Sediment	<0.1	<0.1	<0.1	0.45	0.11	1.12	0.61	2.35
14	MAR01700.003	Sediment	<0.1	<0.1	<0.1	0.14	<0.1	0.31	0.40	0.41
16	MAR01700.004	Sediment	<0.1	<0.1	0.16	0.70	<0.1	1.23	0.77	1.26
18	MAR01700.005	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.96	<0.1
19	MAR01700.006	Sediment	<0.1	<0.1	<0.1	0.29	<0.1	0.42	0.64	0.99
22	MAR01700.007	Sediment	<0.1	0.18	0.10	0.33	0.11	0.64	0.25	1.69
25	MAR01700.008	Sediment	<0.1	<0.1	<0.1	0.52	<0.1	0.28	0.61	0.53
27	MAR01700.009	Sediment	<0.1	<0.1	<0.1	0.35	<0.1	0.49	<0.1	0.76
29	MAR01700.010	Sediment	<0.1	<0.1	0.15	2.43	<0.1	2.74	1.96	1.55
33	MAR01700.011	Sediment	<0.1	<0.1	<0.1	0.34	<0.1	0.33	0.58	0.57
36	MAR01700.012	Sediment	<0.1	<0.1	<0.1	0.43	<0.1	0.56	0.89	1.00
41	MAR01700.013	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
44	MAR01700.014	Sediment	<0.1	<0.1	<0.1	0.29	<0.1	0.49	1.20	0.54
CRM2	MAR01700.016	Sediment	<0.1	<0.1	<0.1	<0.1	0.12	0.67	0.50	0.90
CRM4	MAR01700.018	Sediment	<0.1	<0.1	<0.1	0.39	9.28	3.36	3.46	3.22
Certified Reference Material QOR150MS (Measured Value)			46~	34~	35~	43~	0.14	0.13	0.13	0.32
Certified Reference Material QOR150MS (Certified Value)			40~	40~	40~	40~	0.15	0.11	0.11	0.30
Certified Reference Material QOR150MS (% Recovery)			116~	86~	87~	107~	97	114	126	107
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID MAR01700
Issue Version 1
Customer Reference Dublin Port Sediment Samples

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR01700.001-014	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR01700.001-014	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR01700.001-015	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR01700.001-015	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR01700.001-014	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR01700.001-014	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR01700.001-014	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (DDD) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01700.001-008	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (FLUORANT, FLUORENE) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01700.001-014	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01700.001-014	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

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

Certificate of Analysis

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

Test Report ID	MAR01700
Issue Version	1
Customer Reference	Dublin Port Sediment Samples

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

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

1. General Information	Applicant (company name)	Dublin Port (3FM - 14 subsurface samples)
	Location (port/harbour)	Dublin Port
	Dredge Quantity (tonnes)	
	Permit Application Reg. No. (to be assigned by EPA)	
2. Survey Information	Survey Company	Hydromaster
	Sampling Date	17/12/2022 and 16,17,18 /01/2023
	Analysing Laboratory	SOCOTEC (UK)
	Sub Contract Lab	The Testing Lab (UK) for granulometry
	Analysis Date	All cores received in ASU lab Wed, Jan 18th 2023, extracted on Thurs,19th and dispatched to SOCOTEC on Mon, Jan 23rd after being held at 4°C in the interim
3. Methods Information	Fraction analysed	<2mm
	Water content of sample (reported as %)	%
	Are results reported as wet weight or dry weight?	dry weight
	Granulometry method	Wet and dry sieving followed by laser diffraction analysis.
	TEH method	Solvent extraction and clean-up followed by GC-FID analysis.
	Organic carbon (OC) method	Carbonate removal and sulphurous acid/combustion at 800°C/NDIR.
	Metals (incl. mercury & arsenic) extraction type	HF/Boric extraction
	Methods of detection (metals, incl. mercury & arsenic)	ICPS
	Organics extraction types	Solvent extraction and clean-up (and derivatisation for organotins) wet sediment for TEH, organotins and PAH, air dried sediment for other organics

Methods of detection (PCBs / PAHs / TBT / DBT)	GC-FID for PAHs, GC-MS-MS for PCBs and OCPs, GC-MS for organotins

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID
S2	Dublin Port Company	Dublin Port	16/01/2023 14:50	S2	N 53.345126	W -6.222671	-1.5	MAR01700.001
S7	Dublin Port Company	Dublin Port	16/01/2023 12:20	S7	N 53.343975	W -6.216826	-2.5	MAR01700.002
S14	Dublin Port Company	Dublin Port	16/01/2023 16:01	S14	N 53.342286	W -6.194335	-3	MAR01700.003
S16	Dublin Port Company	Dublin Port	18/01/2023 16:45	S16	N 53.342232	W -6.193661	-3.8	MAR01700.004
S18	Dublin Port Company	Dublin Port	18/01/2023 18:15	S18	N 53.341480	W -6.194275	-4.5	MAR01700.005
S19	Dublin Port Company	Dublin Port	18/01/2023 15:44	S19	N 53.342194	W -6.193163	-2	MAR01700.006
S22	Dublin Port Company	Dublin Port	17/01/2023 17:32	S22	N 53.342220	W -6.192389	-2.5	MAR01700.007
S25	Dublin Port Company	Dublin Port	17/01/2023 17:13	S25	N 53.342375	W -6.189750	-2.2	MAR01700.008
S27	Dublin Port Company	Dublin Port	17/01/2023 15:27	S27	N 53.341976	W -6.189643	-3	MAR01700.009
S29	Dublin Port Company	Dublin Port	17/12/2022 12:00	S29	N 53.342230	W -6.188130	-2.5	MAR01700.010
S33	Dublin Port Company	Dublin Port	17/12/2022 12:24	S33	N 53.342192	W -6.185816	-1.5	MAR01700.011
S36	Dublin Port Company	Dublin Port	18/01/2023 16:30	S36	N 53.342246	W -6.182702	-0.8	MAR01700.012
S41	Dublin Port Company	Dublin Port	17/12/2022 11:16	S41	N 53.342519	W -6.180490	-1.5	MAR01700.013

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID
S44	Dublin Port Company	Dublin Port	18/01/2023 18:15	S44	N 53.342258	W -6.177735	-4.5	MAR01700.014

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}
S2	Grey/Black Sandy Mud	55.0	0.00	22.75	77.25	2.73	7.44	45.0	53400	0.95	0.17	12.3	56.5
S7	Grey/Black Sandy Mud	44.3	0.00	15.84	84.16	2.52	8.88	55.7	52600	1.14	0.22	12.9	56.4
S14	Grey/Black Sandy Mud	35.4	0.00	32.05	67.95	1.49	8.16	64.6	47300	0.26	0.07	7.3	43.7
S16	Grey/Black Sandy Mud	37.1	0.00	21.08	78.92	2.24	7.68	62.9	51100	0.61	0.21	8.6	56.0
S18	Grey/Black Sandy Mud	42.5	0.00	36.84	63.16	2.84	5.28	57.5	51800	0.85	0.47	13.3	46.6
S19	Grey/Black Sandy Mud	39.7	0.00	21.26	78.74	1.60	6.24	60.3	48300	0.44	0.12	8.7	51.6
S22	Grey/Black Sandy Mud	40.0	0.00	25.70	74.30	1.83	4.32	60.0	46100	0.46	0.11	7.6	50.6
S25	Grey/Black Sandy Mud	44.6	0.00	28.56	71.44	2.01	8.16	55.4	62600	0.32	0.09	12.1	60.1
S27	Grey/Black Sandy Mud	47.4	0.00	17.19	82.81	1.72	7.92	52.6	55300	0.48	0.14	10.6	63.6
S29	Grey/Black Sandy Mud	43.8	0.00	19.01	80.99	2.31	4.56	56.2	55900	0.75	0.26	11.2	65.0
S33	Grey/Black Sandy Mud	44.5	0.00	19.93	80.07	1.89	7.44	55.5	55200	0.35	0.09	10.2	62.0
S36	Grey/Black Sandy Mud	52.9	0.00	61.34	38.66	2.61	10.3	47.1	40600	0.47	0.11	7.8	44.9
S41	Brown stiff clay	16.6	0.00	2.96	97.04	0.92	11.0	83.4	44400	1.95	0.06	7.8	50.0

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}
S44	Grey/Black Sandy Mud	48.2	0.00	10.67	89.33	2.06	7.44	51.8	62400	0.40	0.12	10.0	64.3

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}
S2	40.6	49.4	25.7	177	0.648	0.11	<0.1	0.54	0.54	0.83		0.0247	<0.005	1.56	0.95
S7	42.7	64.2	29.0	207	0.675	0.11	<0.1	0.61	0.61	1.12		0.0169	0.0162	2.09	1.17
S14	17.5	24.1	18.7	74.5	0.273	<0.1	<0.1	0.40	0.40	0.31		<0.005	<0.005	0.38	0.21
S16	33.8	53.0	25.9	153	1.010	<0.1	0.16	0.77	0.77	1.23		0.0106	0.0340	1.64	0.90
S18	32.1	59.0	28.1	84.5	0.321	<0.1	<0.1	0.96	0.96	<0.1		<0.005	<0.005	0.19	<0.08
S19	29.5	39.8	27.0	106	0.303	<0.1	<0.1	0.64	0.64	0.42		<0.005	<0.005	0.70	0.63
S22	25.9	32.8	20.1	102	0.364	0.11	0.10	0.25	0.25	0.64		<0.005	<0.005	0.81	0.51
S25	23.4	36.2	28.0	105	0.372	<0.1	<0.1	0.61	0.61	0.28		<0.005	<0.005	0.48	0.28
S27	26.9	43.9	27.0	114	0.701	<0.1	<0.1	<0.1	<0.1	0.49		0.0291	0.0174	0.94	0.44
S29	40.7	60.2	33.3	149	3.220	<0.1	0.15	1.96	1.96	2.74		0.0212	<0.005	2.84	1.57
S33	35.2	33.4	24.7	108	0.519	<0.1	<0.1	0.58	0.58	0.33		<0.005	0.0204	0.48	0.32
S36	36.1	26.1	22.0	97.7	0.921	<0.1	<0.1	0.89	0.89	0.56		<0.005	<0.005	0.81	0.44
S41	27.0	21.0	51.9	92.0	0.033	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	0.22	<0.08

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}
S44	26.4	43.7	29.4	118	0.559	<0.1	<0.1	1.20	1.20	0.49		<0.005	<0.005	0.94	0.49

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}
S2	0.82	0.99	0.87	0.51	0.85	68.9	123	197	534	784	631	546	614	538	121	115
S7	0.90	0.83	1.02	0.58	1.19	28.6	112	145	364	567	445	409	429	381	91.0	89.1
S14	0.19	0.16	0.18	<0.08	0.28	15.1	29.3	57.1	118	176	156	135	150	130	30.7	36.6
S16	0.76	0.81	0.95	0.50	1.02	159	93.7	278	440	507	402	343	398	484	79.3	271
S18	<0.08	<0.08	<0.08	<0.08	<0.08	19.6	12.4	61.4	122	117	112	97	114	140	19.7	65.1
S19	0.40	0.41	0.40	0.26	0.50	17.9	37.3	66.5	199	253	230	187	216	219	38.9	40.9
S22	0.48	0.55	0.76	0.44	0.65	52.8	48.5	91.8	213	293	239	198	238	216	42.9	76.9
S25	0.29	0.31	0.46	0.23	0.44	9.93	31.4	36.1	98.3	148	154	127	134	130	26.3	34.3
S27	0.74	2.27	2.61	2.27	0.71	35.1	38.6	78.9	202	247	259	223	247	249	47.4	64.7
S29	1.15	1.11	1.54	1.02	1.47	450	482	1150	1930	2040	1470	1330	1540	2050	268	728
S33	<0.08	0.33	0.44	0.18	0.37	17.3	33.1	55.3	131	171	173	146	163	160	35.3	44.1
S36	0.24	0.31	0.25	0.24	0.36	<5	29.6	41.0	108	133	102	85.8	111	119	21.3	25.4
S41	<0.08	<0.08	<0.08	<0.08	<0.08	6.58	<5	<5	<5	<5	22.5	15.4	<5	50.2	<5	23.5

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}
S44	0.52	0.77	0.74	0.33	0.74	18.5	15.5	40.0	138	164	210	174	190	190	36.8	44.0

Sample ID code	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}	Sampling notes								
S2	924	577	80.7	373	978	---								
S7	504	418	84.0	198	637	---								
S14	161	142	48.8	102	213	2nd attempt. Hit gravel on first attempt, second attempt reached -3 m								
S16	768	363	123	310	905	---								
S18	162	75.8	39.7	187	179	---								
S19	336	199	39.5	128	350									
S22	349	200	67.1	238	416	Leg broke								
S25	148	134	35.9	94.7	163	3rd attempt. Core obtained on third attempt due to Vibracore								
S27	330	232	55.7	238	370	---								
S29	3380	1340	336	3460	4170	---								
S33	209	157	38.0	150	249	---								
S36	133	91.8	23.6	72.5	196	Refusal -Due to presence of cobble at 0.8 m								
S41	8.03	<5	11.0	67.4	18.6	---								

Sample ID code	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}	Sampling notes									
S44	278	188	53.4	175	252	---									

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured				29.8	132	0.3	0.11	22	20	84.1	40.2	75.9	80200
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value				32.9 (+/-1.8)	147 (+/-6)	0.28 (+/-0.04)	0.08 (+/-0.06)	21.5 (+/-1.2)	21.7 (+/-2.8)	94.3 (+/-1.8)	42.8 (+/-1.6)	65.3 (+/-6.8)	79100 +/- (2000)
CRM IAEA159 (measured value)													
CRM IAEA159 (certified value)													
CRM NIST 1941b (measured value)													
CRM NIST 1941b (certified value)													

Reference Type	DBT mg kg^{-1}	TBT 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}	PCB 180 ug kg^{-1}	PCB 118 ug kg^{-1}	PAH Acenaphthene ug kg^{-1}	PAH Acenaphthylene ug kg^{-1}
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured	0.236	0.254									
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value	0.445 (+/-0.025)	0.343 (+/-0.019)									
CRM IAEA159 (measured value)			0.29	0.46	0.42	0.46	0.5	0.17	0.35	12.1	6.81
CRM IAEA159 (certified value)			0.57 (+/-0.28)	0.67 (+/-0.25)	0.52 (+/-0.16)	0.6 (+/-0.31)	0.56 (+/-0.09)	0.26 (+/-0.1)	0.52 (+/-0.21)	6(+/-4)	6.4(+/-5.4)
CRM NIST 1941b (measured value)			2.93	4.23	4.19	3.55	5.21	2.99	3.92		
CRM NIST 1941b (certified value)			4.52 (+/-0.57)	5.24 (+/-0.28)	5.11 (+/-0.34)	3.6 (+/-0.28)	5.47 (+/-0.32)	3.24 (+/-51)	4.23 (+/-0.19)		

Reference Type	PAH Anthracene ug kg^{-1}	PAH Benzo (a) anthracene ug kg^{-1}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured										
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value										
CRM IAEA159 (measured value)	16.2	54.9	62.7	108	109	44.45	75.9	20.4	13	116
CRM IAEA159 (certified value)	11(+/-5.1)	54(+/-20)	58(+/-26)	100(+/-42)	95(+/-45)	49(+/-14)	58(+/-26)	25(+/-14)	13(+/-7.7)	110(+/-32)
CRM NIST 1941b (measured value)	128	243	244	420	197	180	377	65.5	45.3	540
CRM NIST 1941b (certified value)	184 (+/-18)	335(+/-25)	358(+/-17)	453(+/-21)	307(+/-45)	225(+/-18)	291(+/-31)	53(+/-10)	85(+/-15)	651(+/-50)

Reference Type	PAH Indeno (1,2,3–cd) pyrene	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured									
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value									
CRM IAEA159 (measured value)	114	28.4	76.5	104	0.12	<0.1	0.5	0.9	0.67
CRM IAEA159 (certified value)	120(+/-34)	23(+/-13)	59(+/-29)	100(+/-38)	0.17 (+/- 0.15)	0.21 (+/- 0.18)	0.71(+/- 0.69)	0.82 (+/-0.58	0.89 (+/- 0.50)
CRM NIST 1941b (measured value)	281	487	321	435	9.28			3.22	3.36
CRM NIST 1941b (certified value)	341(+/-57)	848(+/-95)	406(+/-44)	581(+/-39)	5.83 (+/- 0.38)			4.66 (+/-0.46)	3.22 (+/- 0.28)

Reference Type	S DDX (ug kg-1)	Please add columns here for additional		
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) measured				
CRM MESS-4 CRM (metals) & SOPH-1 (organotins) certified value				
CRM IAEA159 (measured value)				
CRM IAEA159 (certified value)				
CRM NIST 1941b (measured value)				
CRM NIST 1941b (certified value)				

Borehole Samples

- Laboratory Results
- Results presented in EPA Format

Certificate of Analysis

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

Test Report ID	**MAR01711**
Issue Version	1
Customer	Fugro GeoServices Ltd, Fugro House, Hithercroft Road, Wallingham, Oxfordshire, OX10 9RB
Customer Reference	F211210 - Dublin Port 3FM
Date Sampled	15-Nov-22 - 01-Feb-23
Date Received	07-Feb-23
Date Reported	28-Feb-23
Condition of samples	Cold Satisfactory

Authorised by:	Marya Hubbard
Position:	Laboratory Manager

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

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Method No	SUB_02*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Visual Description**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	Sandy Gravel
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	Sandy Gravel
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	Sandy Gravel
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	Sandy Gravel

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	%	%	%	%	%	Mg/m3
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Particle Density**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	19.9	80.1	50.42	48.25	1.34	2.65*
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	12.7	87.3	67.73	31.50	0.77	2.66*
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	15.8	84.2	78.45	21.12	0.43	Insufficient*
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	19.7	80.3	50.05	48.14	1.81	Insufficient*
		Reference Material (% Recovery)	NA	NA	NA	NA	NA	NA
		QC Blank	NA	NA	NA	NA	NA	NA

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	% m/m	%m/m
		Method No	WSLM59*	ANC*
		Limit of Detection	0.02	0.12
		Accreditation	UKAS	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**TOC**	**Carbonate Equivalent (%CO3)**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	0.40	23.5
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	0.43	30.2
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	0.44	32.60
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	0.41	<0.12
		Reference Material (% Recovery)	101	NA
		QC Blank	<0.02	NA

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	4.9	0.48	19.3	7.0	11.6	0.02	14.7
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	5.2	0.58	17.9	8.0	9.4	<0.01	17.7
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	3.7	0.70	16.3	6.7	9.4	<0.01	14.6
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	4.3	0.82	19.7	8.7	12.6	<0.01	17.8
Certified Reference Material 2702 (Measured Value)			43.4	0.967	297.2	107.1	120.8	0.373	67.12
Certified Reference Material 2702 (Certified Value)			45.3	0.817	352	117.7	132.8	0.447	75.4
Certified Reference Material 2702 (% Recovery)			101	124	102	105	95	81	105
QC Blank			<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	28.0	14000	14.4
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	35.0	13800	13.0
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	37.8	11600	11.9
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	38.0	13600	12.4
Certified Reference Material 2702 (Measured Value)			416.8	82425	96.3
Certified Reference Material 2702 (Certified Value)			485.3	84000	78.2
Certified Reference Material 2702 (% Recovery)			104	107	96
QC Blank			<3.5	<1750	<2

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	<1	<1
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	<1	<1
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	<1	<1
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	<1	<1
Certified Reference Material BCR-646 (Measured Value)			670	412
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			87	86
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID MAR01711
Issue Version 1
Customer Reference F211210 - Dublin Port 3FM

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	<1	<1	<1	<1	<1	1.37
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	<1	<1	<1	<1	<1	1.52
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	<1	<1	1.52	<1	<1	2.15
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	<1	<1	<1	<1	<1	1.91
Certified Reference Material Nist 1941b (Measured Value)			34.1	53.8	127	238	235	406
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			89	101	69	71	66	90
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	<1	<1	2.23	<1	<1	<1
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	<1	<1	3.22	<1	<1	<1
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	1.21	<1	4.53	<1	2.19	<1
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	1.63	<1	3.03	<1	<1	<1
Certified Reference Material Nist 1941b (Measured Value)			223	385	375	51.7	569	47.7
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			73	171	94	98	87	56
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR01711
Issue Version 1
Customer Reference F211210 - Dublin Port 3FM

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	<1	<1	1.55	<1	1860
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	<1	<1	3.17	<1	2230
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	<1	1.38	7.19	4.06	3800
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	<1	<1	2.81	<1	4290
Certified Reference Material Nist 1941b (Measured Value)			273	515	329	442	1353~
Certified Reference Material Nist 1941b (Certified Value)			341	848	406	581	1400~
Certified Reference Material Nist 1941b (% Recovery)			80	61	81	76	97~
QC Blank			<1	<1	<1	<1	<100

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

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	N*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	0.19	0.40	0.50	0.32	0.42	0.77	0.69
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	0.12	0.16	0.17	0.13	0.09	0.20	0.14
Certified Reference Material CRM QOR150MS (Measured Value)			0.11	0.14	0.27	0.19	0.37	0.40	41.1~
Certified Reference MaterialCRM QOR150MS(Certified Value)			0.14	0.16	0.27	0.17	0.34	0.37	40~
Certified Reference Material CRM QOR150MS(% Recovery)			78	90	99	113	110	108	103~
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
3FM_BH-TC-05 8.00-8.50m	MAR01711.001	Sediment	<0.1	<0.1	<0.1	0.18	<0.1	<0.1	<0.1	0.12
3FM_BH-TC-01 10.00-10.50m	MAR01711.002	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3FM_BH-N-01 11.00-11.50m	MAR01711.003	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3FM_BH-N-04 10.00-10.50m	MAR01711.004	Sediment	<0.1	<0.1	<0.1	0.18	<0.1	0.31	<0.1	0.44
Certified Reference Material CRM QOR150MS(Measured Value)			51.9~	40.5~	0.03	39.8~	0.16	0.13	0.10	0.29
Certified Reference Material CRM QOR150MS (Certified Value)			40~	40~	0.04	40~	0.15	0.11	0.11	0.30
Certified Reference Material CRM QOR150MS (% Recovery)			130~	101~	73	100~	111	121	99	98
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID MAR01711
Issue Version 1
Customer Reference F211210 - Dublin Port 3FM

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR01711.001-004	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR01711.001-004	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR01711.001-004	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR01711.001-004	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR01711.001-004	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR01711.001-004	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR01711.001-002	Analysis carried out using the Gas Jar method as samples were too gravelly for the small pyknometer method.
SUB_02*	MAR01711.003-004	Samples were very gravelly and the sample was insufficient for the Gas Jar method (1.5kg of material would be required).
ASC/SOP/302	MAR01711.001-004	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (PCB180) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01711.001-004	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

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

Certificate of Analysis

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

Test Report ID	MAR01711
Issue Version	1
Customer Reference	F211210 - Dublin Port 3FM

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

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

1. General Information	Applicant (company name)	RPS
	Location (port/harbour)	Dublin Port 3FM
	Dredge Quantity (tonnes)	
	Permit Application Reg. No. (to be assigned by EPA)	
2. Survey Information	Survey Company	Fugro GeoServices Ltd.
	Sampling Date	15th November 2022 to 2nd January 2023
	Analysing Laboratory	SOCOTEC
	Sub Contract Lab	
	Analysis Date	Received: 7th February 2023; Reported: 28th February 2023
3. Methods Information	Fraction analysed	<2mm
	Water content of sample (reported as %)	
	Are results reported as wet weight or dry weight?	Dry Weight
	Granulometry method	wet & dry sieving and laser diffraction
	TEH method	Solvent extraction and GCFID
	Organic carbon (OC) method	High temperature combustion and IR detection
	Metals (incl. mercury & arsenic) extraction type	Hydrofluoric acid
	Methods of detection (metals, incl. mercury & arsenic)	ICPMS & ICPOES
	Organics extraction types	Solvent extraction
	Methods of detection (PCBs / PAHs / TBT / DBT)	GCMS & GCMSMS

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID
MAR01711.001	SOCOTEC UK	3FM_BH-TC-05	15/11/2022	3FM_BH-TC-05 8.00-8.50m	53° 20' 31.54729" N	006° 11' 42.65270" W	8.00-8.50m	MAR01711
MAR01711.002	SOCOTEC UK	3FM_BH-TC-01	25/11/2022	3FM_BH-TC-01 10.00-10.50m	53° 20' 30.23283" N	006° 11' 39.56761" W	10.00-10.50m	MAR01711
MAR01711.003	SOCOTEC UK	3FM_BH-N-01	06/01/2023	3FM_BH-N-01 11.00-11.50m	53° 20' 31.57415" N	006° 11' 26.80367" W	11.00-11.50m	MAR01711
MAR01711.004	SOCOTEC UK	3FM_BH-N-04	01/02/2023	3FM_BH-N-04 10.00-10.50m	53° 20' 31.84017" N	006° 10' 51.61334" W	10.00-10.50m	MAR01711

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:NIe size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}
MAR01711.001	Sandy Gravel	19.9	50.42	48.25	1.34	0.4	23.5	80.1	14000	0.48	0.02	4.9	19.3
MAR01711.002	Sandy Gravel	12.7	67.73	31.5	0.77	0.43	30.2	87.3	13800	0.58	<0.01	5.2	17.9
MAR01711.003	Sandy Gravel	15.8	78.45	21.12	0.43	0.44	32.6	84.2	11600	0.7	<0.01	3.7	16.3
MAR01711.004	Sandy Gravel	19.7	50.05	48.14	1.81	0.41	<0.12	80.3	13600	0.82	<0.01	4.3	19.7

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}
MAR01711.001	7	11.6	15	28	0.002	<0.1	<0.1	<0.1	0.12	<0.1		<0.001	<0.001	0.1900	0.4000
MAR01711.002	8	9.4	18	35	0.002	<0.1	<0.1	<0.1	<0.1	<0.1		<0.001	<0.001	<0.08	<0.08
MAR01711.003	6.7	9.4	14.6	37.8	0.004	<0.1	<0.1	<0.1	<0.1	<0.1		<0.001	<0.001	<0.08	<0.08
MAR01711.004	8.7	12.6	17.8	38	0.004	<0.1	<0.1	<0.1	0.44	0.31		<0.001	<0.001	0.1200	0.1600

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}
MAR01711.001	0.5000	0.4200	0.7700	0.6900	0.3200	<1	<1	<1	<1	<1	1.37	<1	<1	2.23	<1
MAR01711.002	<0.08	<0.08	<0.08	<0.08	<0.08	<1	<1	<1	<1	<1	1.52	<1	<1	3.22	<1
MAR01711.003	<0.08	<0.08	<0.08	<0.08	<0.08	<1	<1	1.52	<1	<1	2.15	1.21	<1	4.53	<1
MAR01711.004	0.1700	0.0900	0.2000	0.1400	0.1300	<1	<1	<1	<1	<1	1.91	1.63	<1	3.03	<1

Sample ID code	PAH Flourene ug kg^{-1}	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}									
MAR01711.001	<1	<1	<1	<1	1.55	<1									
MAR01711.002	<1	<1	<1	<1	3.17	<1									
MAR01711.003	<1	2.19	<1	1.38	7.19	4.06									
MAR01711.004	<1	<1	<1	<1	2.81	<1									

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID
MAR01711.001	SOCOTEC UK	3FM_BH-TC-05	15/11/2022	3FM_BH-TC-05 8.00-8.50m	53° 20' 31.54729" N	006° 11' 42.65270" W	8.00-8.50m	MAR01711
MAR01711.002	SOCOTEC UK	3FM_BH-TC-01	25/11/2022	3FM_BH-TC-01 10.00-10.50m	53° 20' 30.23283" N	006° 11' 39.56761" W	10.00-10.50m	MAR01711
MAR01711.003	SOCOTEC UK	3FM_BH-N-01	06/01/2023	3FM_BH-N-01 11.00-11.50m	53° 20' 31.57415" N	006° 11' 26.80367" W	11.00-11.50m	MAR01711
MAR01711.004	SOCOTEC UK	3FM_BH-N-04	01/02/2023	3FM_BH-N-04 10.00-10.50m	53° 20' 31.84017" N	006° 10' 51.61334" W	10.00-10.50m	MAR01711

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results (2)

Sample ID code	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:NIe size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}
MAR01711.001	Sandy Gravel	19.9	50.42	48.25	1.34	0.4	23.5	80.1	14000	0.48	0.02	4.9	19.3
MAR01711.002	Sandy Gravel	12.7	67.73	31.5	0.77	0.43	30.2	87.3	13800	0.58	<0.01	5.2	17.9
MAR01711.003	Sandy Gravel	15.8	78.45	21.12	0.43	0.44	32.6	84.2	11600	0.7	<0.01	3.7	16.3
MAR01711.004	Sandy Gravel	19.7	50.05	48.14	1.81	0.41	<0.12	80.3	13600	0.82	<0.01	4.3	19.7

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results (2)

Sample ID code	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}
MAR01711.001	7	11.6	15	28	1860	<0.1	<0.1	<0.1	0.12	<0.1		<0.001	<0.001	0.1900	0.4000
MAR01711.002	8	9.4	18	35	2230	<0.1	<0.1	<0.1	<0.1	<0.1		<0.001	<0.001	<0.08	<0.08
MAR01711.003	6.7	9.4	14.6	37.8	3800	<0.1	<0.1	<0.1	<0.1	<0.1		<0.001	<0.001	<0.08	<0.08
MAR01711.004	8.7	12.6	17.8	38	4290	<0.1	<0.1	<0.1	0.44	0.31		<0.001	<0.001	0.1200	0.1600

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}
MAR01711.001	0.5000	0.4200	0.7700	0.6900	0.3200	<1	<1	<1	<1	<1	1.37	<1	<1	2.23	<1
MAR01711.002	<0.08	<0.08	<0.08	<0.08	<0.08	<1	<1	<1	<1	<1	1.52	<1	<1	3.22	<1
MAR01711.003	<0.08	<0.08	<0.08	<0.08	<0.08	<1	<1	1.52	<1	<1	2.15	1.21	<1	4.53	<1
MAR01711.004	0.1700	0.0900	0.2000	0.1400	0.1300	<1	<1	<1	<1	<1	1.91	1.63	<1	3.03	<1

Sample ID code	PAH Flourene ug kg^{-1}	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}									
MAR01711.001	<1	<1	<1	<1	1.55	<1									
MAR01711.002	<1	<1	<1	<1	3.17	<1									
MAR01711.003	<1	2.19	<1	1.38	7.19	4.06									
MAR01711.004	<1	<1	<1	<1	2.81	<1									

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}	DBT mg kg^{-1}	TBT mg kg^{-1}
CRM (measured value)	2702			107.1	416.8	0.967	0.373	120.8	43.4	297.2	67.12	96.3	82425		
CRM (certified value)	2702			117.7	485.3	0.817	0.447	132.8	45.3	352	75.4	78.2	84000		
CRM (measured value)	BCR-646													670	412
CRM (certified value)	BCR-646													770	480
CRM (measured value)	Nist 1941b														
CRM (certified value)	Nist 1941b														
CRM (measured value)	QOR150MS														
CRM (certified value)	QOR150MS														

Reference Type	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}	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}	PAH Benzo (b) fluoranthene ug kg^{-1}
CRM (measured value)													
CRM (certified value)													
CRM (measured value)													
CRM (certified value)													
CRM (measured value)								34.1	53.8	127	238	235	406
CRM (certified value)								38.4	53.3	184	335	358	453
CRM (measured value)	0.11	0.14	0.27	0.37	0.4		0.19						
CRM (certified value)	0.14	0.16	0.27	0.34	0.37		0.17						

Reference Type	PAH Benzo (ghi) perylene ug kg^{-1}	PAH Benzo (k) fluoranthene ug kg^{-1}	PAH Chrysene ug kg^{-1}	PAH Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}	HCB (ug kg-1)
CRM (measured value)											
CRM (certified value)											
CRM (measured value)											
CRM (certified value)											
CRM (measured value)	223	385	375	51.7	47.7	569	273	515	329	442	
CRM (certified value)	307	225	399	53	85	651	341	848	406	581	
CRM (measured value)											0.16
CRM (certified value)											0.15

Reference Type	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	Please add columns here for additional		
CRM (measured value)								
CRM (certified value)								
CRM (measured value)								
CRM (certified value)								
CRM (measured value)								
CRM (certified value)								
CRM (measured value)	0.03	0.1	0.29	0.13				
CRM (certified value)	0.04	0.11	0.3	0.11				

Additional 9 Surface and Vibrocore Samples

- Laboratory Results
- Results presented in EPA Format

Certificate of Analysis

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

Test Report ID	**MAR01737**	
Issue Version	1	
Customer	Hydromaster, 7 Howley Court, Dublin Road, Oranmore, Co. Galway	
Customer Reference	2301_DP_GS_01	
Date Sampled	16-Jan-14-Feb-2023	
Date Received	22-Feb-23	
Date Reported	27-Mar-23	
Condition of samples	Cold	Satisfactory

Authorised by: Marya Hubbard

Position: Laboratory Manager

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

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Method No	SUB_02*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Visual Description**
AC1	MAR01737.001	Sediment	Dark grey organic slightly gravelly CLAY.
DP 02	MAR01737.002	Sediment	Dark grey organic SILT.
AC3	MAR01737.003	Sediment	Dark grey organic SILT.
DP 04	MAR01737.004	Sediment	Dark grey organic SILT.
AC5	MAR01737.005	Sediment	Dark grey organic SILT.
DP 06	MAR01737.006	Sediment	Dark grey organic SILT.
AC7	MAR01737.007	Sediment	Dark grey SAND.
DP 08	MAR01737.008	Sediment	Dark grey organic SILT.
AC9	MAR01737.009	Sediment	Dark grey organic SILT.

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	%	%	%	%	%	Mg/m3
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Particle Density**
AC1	MAR01737.001	Sediment	41.7	58.3	0.00	20.50	79.50	2.60
DP 02	MAR01737.002	Sediment	40.4	59.6	8.41	23.08	68.51	2.61
AC3	MAR01737.003	Sediment	26.1	73.9	28.63	34.98	36.39	2.60
DP 04	MAR01737.004	Sediment	55.7	44.3	0.00	29.52	70.48	2.59
AC5	MAR01737.005	Sediment	46.2	53.8	0.00	23.88	76.12	2.61
DP 06	MAR01737.006	Sediment	61.7	38.3	0.00	35.31	64.69	2.40
AC7	MAR01737.007	Sediment	17.8	82.2	0.00	57.14	42.86	2.67
DP 08	MAR01737.008	Sediment	55.9	44.1	0.00	32.82	67.18	2.63
AC9	MAR01737.009	Sediment	45.0	55.0	0.00	17.96	82.04	2.63
		Reference Material (% Recovery)	NA	NA	NA	NA	NA	NA
		QC Blank	NA	NA	NA	NA	NA	NA

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	% m/m	%m/m
		Method No	WSLM59*	ANC*
		Limit of Detection	0.02	0.12
		Accreditation	UKAS	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**TOC**	**Carbonate Equivalent (%CO3)**
AC1	MAR01737.001	Sediment	1.56	9.12
DP 02	MAR01737.002	Sediment	1.65	9.12
AC3	MAR01737.003	Sediment	2.32	8.64
DP 04	MAR01737.004	Sediment	2.12	7.20
AC5	MAR01737.005	Sediment	1.40	7.68
DP 06	MAR01737.006	Sediment	2.19	8.40
AC7	MAR01737.007	Sediment	0.82	14.4
DP 08	MAR01737.008	Sediment	1.76	10.3
AC9	MAR01737.009	Sediment	1.44	10.8
		Reference Material (% Recovery)	100	100
		QC Blank	<0.02	<0.12

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
AC1	MAR01737.001	Sediment	14.2	0.86	66.7	38.4	52.5	0.15	32.3
DP 02	MAR01737.002	Sediment	13.9	0.91	67.6	42.2	49.3	0.14	31.7
AC3	MAR01737.003	Sediment	10.6	0.70	58.2	17.4	20.9	0.04	32.1
DP 04	MAR01737.004	Sediment	17.2	1.17	81.2	56.5	55.0	0.20	37.4
AC5	MAR01737.005	Sediment	11.6	0.81	60.4	30.8	35.5	0.11	29.0
DP 06	MAR01737.006	Sediment	12.0	1.70	57.5	37.7	28.1	0.09	39.5
AC7	MAR01737.007	Sediment	10.6	1.38	51.5	34.1	26.0	0.08	33.4
DP 08	MAR01737.008	Sediment	12.0	0.74	65.9	43.2	39.4	0.12	33.2
AC9	MAR01737.009	Sediment	13.1	0.74	67.2	34.8	46.6	0.15	31.5
		Certified Reference Material 2702 (Measured Value)	45.88	1.002	299.3	107.5	121.6	0.451	67.46
		Certified Reference Material 2702 (Certified Value)	45.3	0.817	352	117.7	132.8	0.447	75.4
		Certified Reference Material 2702 (% Recovery)	107	129	103	106	96	98	105
		QC Blank	<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
AC1	MAR01737.001	Sediment	192	50700	68.5
DP 02	MAR01737.002	Sediment	176	44200	58.1
AC3	MAR01737.003	Sediment	78.1	49600	65.1
DP 04	MAR01737.004	Sediment	309	49000	64.4
AC5	MAR01737.005	Sediment	119	43000	54.4
DP 06	MAR01737.006	Sediment	136	47500	62.4
AC7	MAR01737.007	Sediment	124	25900	24.9
DP 08	MAR01737.008	Sediment	144	48700	64.2
AC9	MAR01737.009	Sediment	142	47400	62.3
Certified Reference Material 2702 (Measured Value)			452.1	92165	102
Certified Reference Material 2702 (Certified Value)			485.3	84000	78.2
Certified Reference Material 2702 (% Recovery)			112	98	104
QC Blank			<3.5	<1750	<2

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
AC1	MAR01737.001	Sediment	9.38	10.1
DP 02	MAR01737.002	Sediment	<5	13.7
AC3	MAR01737.003	Sediment	<5	<5
DP 04	MAR01737.004	Sediment	<5	<5
AC5	MAR01737.005	Sediment	<5	<5
DP 06	MAR01737.006	Sediment	<5	<5
AC7	MAR01737.007	Sediment	<5	<5
DP 08	MAR01737.008	Sediment	<5	<5
AC9	MAR01737.009	Sediment	78.9	<5
Certified Reference Material BCR-646 (Measured Value)			529	342
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			69	71
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
AC1	MAR01737.001	Sediment	21.8	47.9	71.3	168	260	236
DP 02	MAR01737.002	Sediment	21.1	51.0	73.5	177	273	234
AC3	MAR01737.003	Sediment	<5	<5	<5	<5	<5	10.4
DP 04	MAR01737.004	Sediment	31.1	35.2	51.4	136	185	172
AC5	MAR01737.005	Sediment	15.9	28.5	49.9	121	171	163
DP 06	MAR01737.006	Sediment	<5	34.3	47.6	108	154	135
AC7	MAR01737.007	Sediment	7.15	<5	<5	<5	<5	20.6
DP 08	MAR01737.008	Sediment	13.1	47.3	73.5	189	197	171
AC9	MAR01737.009	Sediment	26.4	24.6	43.7	135	185	188
Certified Reference Material Nist 1941b (Measured Value)			28.9	62.3	127	205	197	387
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			75	117	69	61	55	85
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
AC1	MAR01737.001	Sediment	200	212	176	35.0	221	46.3
DP 02	MAR01737.002	Sediment	197	225	182	42.9	232	48.2
AC3	MAR01737.003	Sediment	7.18	<5	10.5	<5	7.85	<5
DP 04	MAR01737.004	Sediment	144	157	148	28.1	244	44.3
AC5	MAR01737.005	Sediment	132	148	135	27.1	183	33.7
DP 06	MAR01737.006	Sediment	120	125	128	22.2	148	32.5
AC7	MAR01737.007	Sediment	10.0	<5	48.5	<5	6.48	28.5
DP 08	MAR01737.008	Sediment	132	159	206	26.8	256	37.8
AC9	MAR01737.009	Sediment	148	162	159	28.3	240	41.5
Certified Reference Material Nist 1941b (Measured Value)			228	330	339	57.1	527	48.4
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			74	147	85	108	81	57
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
AC1	MAR01737.001	Sediment	208	57.5	132	314	392000
DP 02	MAR01737.002	Sediment	208	59.7	140	312	359000
AC3	MAR01737.003	Sediment	<5	<5	9.93	11.7	38500
DP 04	MAR01737.004	Sediment	149	67.2	162	262	421000
AC5	MAR01737.005	Sediment	144	35.0	112	217	349000
DP 06	MAR01737.006	Sediment	119	33.1	95.8	199	403000
AC7	MAR01737.007	Sediment	<5	12.4	83.4	15.8	37900
DP 08	MAR01737.008	Sediment	133	37.8	97.7	363	367000
AC9	MAR01737.009	Sediment	152	39.4	168	308	370000
Certified Reference Material Nist 1941b (Measured Value)			247	512	306	403	1270~
Certified Reference Material Nist 1941b (Certified Value)			341	848	406	581	1400~
Certified Reference Material Nist 1941b (% Recovery)			72	60	75	69	91~
QC Blank			<1	<1	<1	<1	<100

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	N*	UKAS	UKAS	UKAS	UKAS	N*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
AC1	MAR01737.001	Sediment	1.46	0.81	0.61	0.78	0.85	0.94	0.56
DP 02	MAR01737.002	Sediment	1.42	0.72	0.61	0.74	0.96	0.71	0.53
AC3	MAR01737.003	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
DP 04	MAR01737.004	Sediment	1.28	0.69	0.64	0.67	0.72	0.83	0.73
AC5	MAR01737.005	Sediment	1.17	0.66	0.63	0.75	0.38	0.53	0.54
DP 06	MAR01737.006	Sediment	0.85	0.41	0.40	0.37	0.46	0.49	0.24
AC7	MAR01737.007	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
DP 08	MAR01737.008	Sediment	0.59	0.29	0.30	0.20	0.26	0.40	0.14
AC9	MAR01737.009	Sediment	3.74	2.03	1.24	1.32	1.01	1.27	1.15
Certified Reference Material Nist 1941b (Measured Value)			3.27	4.45	5.33	4.14	3.70	5.41	3.44
Certified Reference Material Nist 1941b (Certified Value)			4.52	5.24	5.11	4.23	3.60	5.47	3.24
Certified Reference Material Nist 1941b (% Recovery)			72	85	104	98	103	99	106
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
AC1	MAR01737.001	Sediment	<0.1	<0.1	<0.1	0.13	<0.1	0.70	0.15	1.47
DP 02	MAR01737.002	Sediment	<0.1	<0.1	<0.1	0.28	<0.1	0.84	0.97	1.87
AC3	MAR01737.003	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DP 04	MAR01737.004	Sediment	<0.1	<0.1	<0.1	0.21	<0.1	0.96	0.20	1.71
AC5	MAR01737.005	Sediment	<0.1	<0.1	<0.1	0.50	<0.1	0.61	<0.1	1.72
DP 06	MAR01737.006	Sediment	<0.1	<0.1	<0.1	0.29	<0.1	0.60	<0.1	1.20
AC7	MAR01737.007	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
DP 08	MAR01737.008	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.41	<0.1	0.88
AC9	MAR01737.009	Sediment	<0.1	<0.1	<0.1	0.22	<0.1	1.33	0.16	2.69
Certified Reference Material Nist 1941b (Measured Value)			44~	43~	49~	44~	6.89	3.16	0.55	4.54
Certified Reference Material Nist 1941b (Certified Value)			40~	40~	40~	40~	5.83	3.22	1.12	4.66
Certified Reference Material Nist 1941b (% Recovery)			110	109	122	109	118	98	50	97
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID MAR01737
Issue Version 1
Customer Reference 2301_DP_GS_01

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR01737.-001-009	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR01737.-001-009	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR01737.-001-009	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR01737.-001-009	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR01737.-001-009	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR01737.-001-009	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR01737.-002-009	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR01737.-001-009	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (PCB52, PCB180) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01737.-003, .006-007	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/303/304	MAR01737.-001-009	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR01737.-001-009	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

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

Certificate of Analysis

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

Test Report ID	MAR01737
Issue Version	1
Customer Reference	2301_DP_GS_01

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

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

1. General Information	Applicant (company name)	
	Location (port/harbour)	
	Dredge Quantity (tonnes)	
	Permit Application Reg. No. (to be assigned by EPA)	
2. Survey Information	Survey Company	
	Sampling Date	
	Analysing Laboratory	SOCOTEC
	Sub Contract Lab	
	Analysis Date	
3. Methods Information	Fraction analysed	<2mm
	Water content of sample (reported as %)	
	Are results reported as wet weight or dry weight?	Dry Weight
	Granulometry method	Wet and dry sieving followed by laser diffraction analysis.
	TEH method	Solvent extraction and GCFID
	Organic carbon (OC) method	High temperature combustion and IR detection
	Metals (incl. mercury & arsenic) extraction type	Hydrofluoric acid
	Methods of detection (metals, incl. mercury & arsenic)	ICPMS & ICPOES
	Organics extraction types	Solvent extraction
	Methods of detection (PCBs / PAHs / TBT / DBT)	GCMS & GCMSMS

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID	Sample appearance (e.g. colour, texture, signs of life)
MAR01737.001	SOCOTEC UK	Dublin Port	17/01/2023	AC1	53.34465	-6.21479	1.8	MAR01737	Dark grey organic slightly gravelly CLAY.
MAR01737.002	SOCOTEC UK	Dublin Port	09/02/2023	DP 02	53.34402	-6.21426	surface	MAR01737	Dark grey organic SILT.
MAR01737.003	SOCOTEC UK	Dublin Port	16/01/2023	AC3	53.34406	-6.21337	1	MAR01737	Dark grey organic SILT.
MAR01737.004	SOCOTEC UK	Dublin Port	14/02/2023	DP 04	53.34377	-6.21274	surface	MAR01737	Dark grey organic SILT.
MAR01737.005	SOCOTEC UK	Dublin Port	16/01/2023	AC5	53.34334	-6.20681	1	MAR01737	Dark grey organic SILT.
MAR01737.006	SOCOTEC UK	Dublin Port	09/02/2023	DP 06	53.34334	-6.20581	surface	MAR01737	Dark grey organic SILT.
MAR01737.007	SOCOTEC UK	Dublin Port	16/01/2023	AC7	53.34293	-6.20477	2.8	MAR01737	Dark grey SAND.
MAR01737.008	SOCOTEC UK	Dublin Port	09/02/2023	DP 08	53.34323	-6.20422	surface	MAR01737	Dark grey organic SILT.
MAR01737.009	SOCOTEC UK	Dublin Port	16/01/2023	AC9	53.34285	-6.20378	1.8	MAR01737	Dark grey organic SILT.

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}
MAR01737.001	41.7	0	20.5	79.5	1.56	9.12	58.3	50700	0.86	0.15	14.2	66.7	38.4	52.5	32
MAR01737.002	40.4	8.41	23.08	68.51	1.65	9.12	59.6	44200	0.91	0.14	13.9	67.6	42.2	49.3	32
MAR01737.003	26.1	28.63	34.98	36.39	2.32	8.64	73.9	49600	0.7	0.04	10.6	58.2	17.4	20.9	32.1
MAR01737.004	55.7	0	29.52	70.48	2.12	7.2	44.3	49000	1.17	0.2	17.2	81.2	56.5	55	37.4
MAR01737.005	46.2	0	23.88	76.12	1.4	7.68	53.8	43000	0.81	0.11	11.6	60.4	30.8	35.5	29.0
MAR01737.006	61.7	0	35.31	64.69	2.19	8.4	38.3	47500	1.7	0.09	12	57.5	37.7	28.1	39.5
MAR01737.007	17.8	0	57.14	42.86	0.82	14.4	82.2	25900	1.38	0.08	10.6	51.5	34.1	26	33.4
MAR01737.008	55.9	0	32.82	67.18	1.76	10.3	44.1	48700	0.74	0.12	12	65.9	43.2	39.4	33.2
MAR01737.009	45	0	17.96	82.04	1.44	10.8	55	47400	0.74	0.15	13.1	67.2	34.8	46.6	31.5

Sample ID code	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	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}
MAR01737.001	192	392000	<0.1	<0.1	0.15	1.47	0.7		0.0094	0.01.1	1.4600	0.8100	0.6100	0.8500	0.9400
MAR01737.002	176	359000	<0.1	<0.1	0.97	1.87	0.84		<0.005	0.0137	1.4200	0.7200	0.6100	0.9600	0.7100
MAR01737.003	78.1	38500	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08	<0.08	<0.08	<0.08
MAR01737.004	309	421000	<0.1	<0.1	0.2	1.71	0.96		<0.005	<0.005	1.2800	0.6900	0.6400	0.7200	0.8300
MAR01737.005	119	349000	<0.1	<0.1	<0.1	1.72	0.61		<0.005	<0.005	1.1700	0.6600	0.6300	0.3800	0.5300
MAR01737.006	136	403000	<0.1	<0.1	<0.1	1.2	0.6		<0.005	<0.005	0.8500	0.4100	0.4000	0.4600	0.4900
MAR01737.007	124	37900	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08	<0.08	<0.08	<0.08
MAR01737.008	144	367000	<0.1	<0.1	<0.1	0.88	0.41		<0.005	<0.005	0.5900	0.2900	0.3000	0.2600	0.4000
MAR01737.009	142	370000	<0.1	<0.1	0.16	2.69	1.33		0.0789	<0.005	3.7400	2.0300	1.2400	1.0100	1.2700

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene ug kg^{-1}	PAH Naphthalene ug kg^{-1}
MAR01737.001	0.5600	0.7800	21.80	47.90	71.30	168.00	260.00	236.00	200.00	212.00	176.00	35.00	46.30	221.00	208.00	57.50
MAR01737.002	0.5300	0.7400	21.10	51.00	73.50	177.00	273.00	234.00	197.00	225.00	182.00	42.90	48.20	232.00	208.00	59.70
MAR01737.003	<0.08	<0.08	<5	<5	<5	<5	<5	10.40	7.18	<5	10.50	<5	<5	7.85	<5	<5
MAR01737.004	0.7300	0.6700	31.10	35.20	51.40	136.00	185.00	172.00	144.00	157.00	148.00	28.10	44.30	244.00	149.00	67.20
MAR01737.005	0.5400	0.7500	15.90	28.50	49.90	121.00	171.00	163.00	132.00	148.00	135.00	27.10	33.70	183.00	144.00	35.00
MAR01737.006	0.2400	0.3700	<5	34.30	47.60	108.00	154.00	135.00	120.00	125.00	128.00	22.20	32.50	148.00	119.00	33.10
MAR01737.007	<0.08	<0.08	7.15	<5	<5	<5	<5	20.60	10.00	<5	48.50	<5	28.50	6.48	<5	12.40
MAR01737.008	0.1400	0.2000	13.10	47.30	73.50	189.00	197.00	171.00	132.00	159.00	206.00	26.80	37.80	256.00	133.00	37.80
MAR01737.009	1.1500	1.3200	26.4	24.6	43.70	135.00	185.00	188.00	148.00	162.00	159.00	28.30	41.50	240.00	152	39.4

Sample ID code	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}												
MAR01737.001	132.00	314.00												
MAR01737.002	140.00	312.00												
MAR01737.003	9.93	11.70												
MAR01737.004	162.00	262.00												
MAR01737.005	112.00	217.00												
MAR01737.006	95.80	199.00												
MAR01737.007	83.40	15.80												
MAR01737.008	97.70	363.00												
MAR01737.009	168	308												

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}	DBT mg kg^{-1}	TBT mg kg^{-1}
CRM (measured value)	2702			107.5	452.1	1.002	0.451	121.6	45.88	299.3	67.49	102	92165		
CRM (certified value)	2702			117.7	485.3	0.817	0.447	132.8	45.3	352	75.4	78.2	84000		
CRM (measured value)	BCR-646													529	342
CRM (certified value)	BCR-646													770	480
CRM (measured value)	Nist 1941b														
CRM (certified value)	Nist 1941b														
CRM (measured value)															
CRM (certified value)															

Reference Type	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}	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}	PAH Benzo (b) fluoranthene ug kg^{-1}
CRM (measured value)													
CRM (certified value)													
CRM (measured value)													
CRM (certified value)													
CRM (measured value)	3.27	4.45	5.33	3.7	5.41	3.44	4.14	28.9	62.3	127	205	197	387
CRM (certified value)	4.52	5.24	5.11	3.6	5.47	3.24	4.23	38.4	53.3	184	335	358	453
CRM (measured value)													
CRM (certified value)													

Reference Type	PAH Benzo (ghi) perylene ug kg^{-1}	PAH Benzo (k) fluoranthene ug kg^{-1}	PAH Chrysene ug kg^{-1}	PAH Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}	HCB (ug kg-1)
CRM (measured value)											
CRM (certified value)											
CRM (measured value)											
CRM (certified value)											
CRM (measured value)	228	330	339	57.1	48.4	527	247	512	306	403	6.89
CRM (certified value)	307	225	399	53	85	651	341	848	406	581	5.83
CRM (measured value)											
CRM (certified value)											

Reference Type	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	Please add columns here for additional		
CRM (measured value)								
CRM (certified value)								
CRM (measured value)								
CRM (certified value)								
CRM (measured value)		0.55	4.54	3.16				
CRM (certified value)		1.12	4.66	3.22				
CRM (measured value)								
CRM (certified value)								

Radiological Sample Results

Laboratory Test Report

Report Date: 3rd February 2023

Samples Tested on Behalf of: RPS Consulting

Laboratory Analysis: RT050 High-Resolution Gamma Spectrometry

Sample Type: Dredge Samples

Date of Receipt: 3/10/2022 and 24/10/2022

Date of Analysis January 2023

Results:

ORM Reference	Client Reference	Date of Receipt	Nuclide	Activity Concentration (Bq/kg, dry)[1]
ES2200575 Composite 1	Stations: S6 S8 S11 S15	3/10/2022	K-40 I-131 Cs-134 Cs-137 Ra-226 Ra-228 U-235 Am-241	450.8 ± 9.9 Nd Nd 12.08 ± 0.31 21.96 ± 1.37 20.61 ± 1.12 Nd 3.6 ± 0.2

ES2200576 Composite 2	Stations: S20 S21 S23 S25 S26	3/10/2022	K-40 I-131 Cs-134 Cs-137 Ra-226 Ra-228 U-235 Am-241	414.4 ± 8.9 Nd Nd 8.12 ± 0.19 18.70 ± 1.15 17.82 ± 0.87 Nd 3.7 ± 0.2
ES2200577 Composite 3	Stations: S30 S31 S32 S34 S38	3/10/2022	K-40 I-131 Cs-134 Cs-137 Ra-226 Ra-228 U-235 Am-241	472.1 ± 8.5 Nd Nd 10.06 ± 0.32 19.86 ± 1.120 20.92 ± 1.20 Nd 3.6 ± 0.2
ES2200609 Composite 4	Stations: S1 S3 S4 S5	24/10/2022	K-40 I-131 Cs-134 Cs-137 Ra-226 Ra-228 U-235 Am-241	416.8 ± 6.2 Nd Nd 13.54 ± 0.20 21.79 ± 0.86 18.56 ± 0.81 1.36 ± 0.09 3.3 ± 0.1
ES2200610 Composite 5	Stations: S12 S17 S37 S42 S43	24/10/2022	K-40 I-131 Cs-134 Cs-137 Ra-226 Ra-228 U-235 Am-241	375.5 ± 5.5 Nd Nd 6.31 ± 0.10 16.67 ± 0.63 15.43 ± 0.65 0.95 ± 0.07 2.0 ± 0.1

Note:
(1) Quoted uncertainties are ±1 SD counting statistics
(2) nd = not detected

The Office of Radiation Protection and Environmental Monitoring received twenty-three grab sediment sample from RPS Consulting in support of an application for a Capital/Maintenance Dredging Permit at Dublin Port.

Five composite samples were prepared by placing an aliquot in a well-defined counting geometry and then measured on a high-resolution gamma spectrometer. Appropriate density corrections were applied to the resultant spectra to take account of the differences

in sample density. Dry to wet weight ratio was determined for the sample. Results are quoted on a dry weight basis.

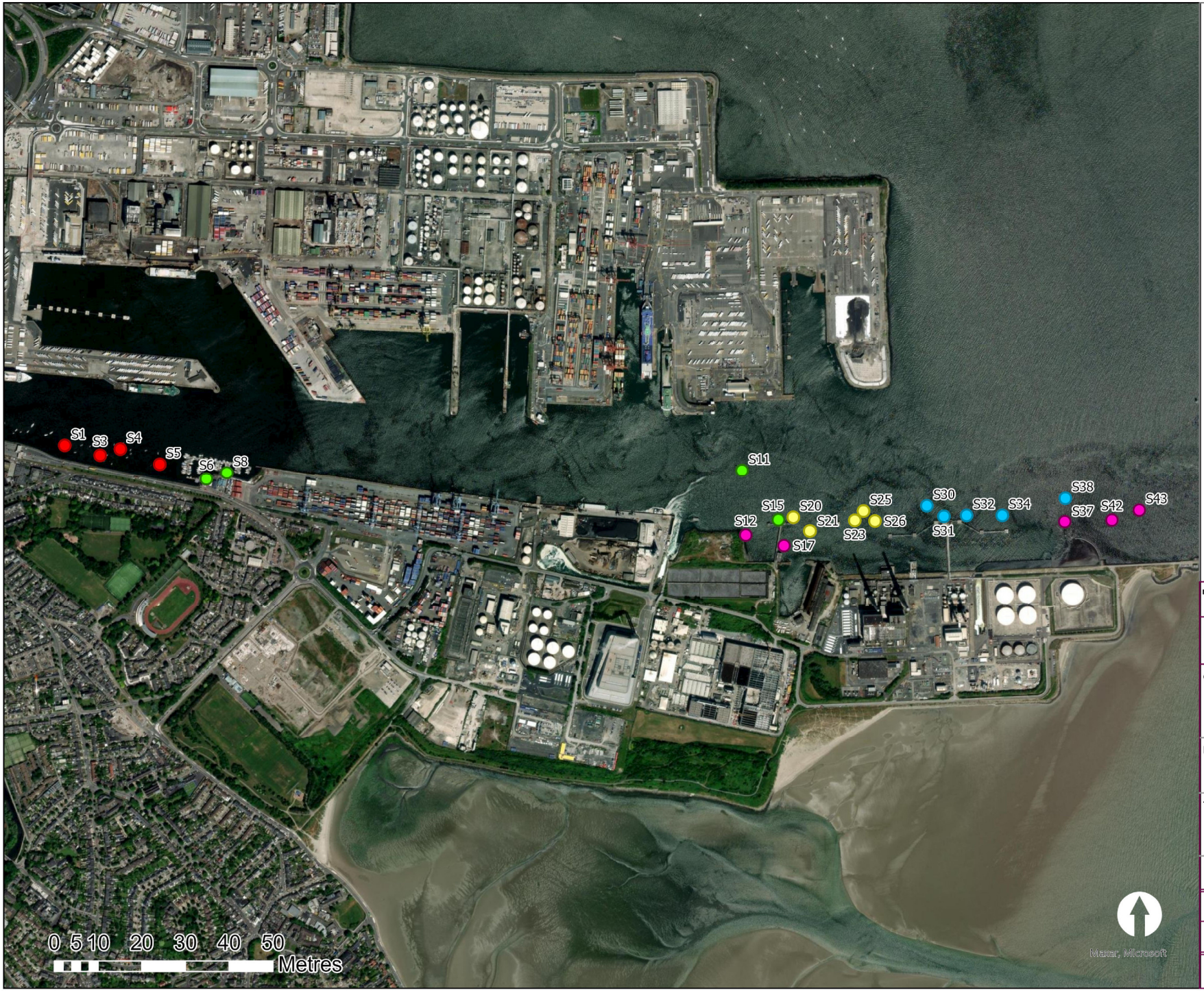
The results indicate that dumping of these materials at sea will not result in a radiological hazard.

Simon O'Toole
Radiochemistry Laboratory Manager

Notes:

- This report relates only to the samples tested.
- This report shall not be reproduced except in full, without the approval of the Agency
- Where applicable, the number following the symbol ± is the combined standard uncertainty and not a confidence interval.

3 Clonskeagh Square, Clonskeagh Road, Dublin 14, D14H424, Ireland
T: +353 1 2680100 F: +353 1 2680199
W: www.epa.ie



Legend

Sample Type

- Composite 1
- Composite 2
- Composite 3
- Composite 4
- Composite 5

rev	ammendments	drawn	date

rps
Elmwood House T +44(0) 28 90 667914
74 Boucher Road F +44(0) 28 90 668286
Belfast W www.rpsgroup.com/ireland
BT12 6RZ E ireland@rpsgroup.com

CLIENT
Dublin Port Company

PROJECT
3FM

TITLE
Appendix 8-4 Radiological Testing by EPA

Project Number	Sheet Size	Drawing Scale
NI2541	A3	1:10,000

Drawing Number	Datum
Appendix 8-4	n/a

Drawn by	Status	Revision
SP	D	01

Checked By	Approved By	Date
RB	RB	06/03/2024

Surface Samples at proposed Wharf N

- Laboratory Results
- Results presented in EPA Format

Certificate of Analysis

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

Test Report ID MAR02158

Issue Version: 1

Customer: Hydromaster Ltd, 7 Howley Court, Dublin Road, Oranmore, Co. Galway

Customer Reference: Dublin Power Station - Sediment Chemistry Survey

Date Sampled: 13-15-Dec-23

Date Samples Received: 18-Dec-23

Test Report Date: 24-Jan-24

Condition of samples: Frozen Satisfactory

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

JMColbourne

Authorised by: Jane Colbourne

Position: Customer Service Specialist

UKAS TESTING
1252

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Method No	SUB_02*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Visual Description**
A01_DPC2312	MAR02158.001	Sediment	Dark grey organic SILT
A02_DPC2312	MAR02158.002	Sediment	Dark grey organic clayey SILT
A03_DPC2312	MAR02158.003	Sediment	Dark grey organic clayey SILT
A04_DPC2312	MAR02158.004	Sediment	Dark grey organic clayey SILT
A05_DP2312	MAR02158.005	Sediment	Dark grey slightly sandy slightly gravelly organic SILT
A06_DP2312	MAR02158.006	Sediment	Dark grey slightly sandy slightly gravelly organic SILT
A07_DP2312	MAR02158.007	Sediment	Dark grey sandy SILT
A08_DP2312	MAR02158.008	Sediment	Dark grey slightly gravelly SAND
A09_DP2312	MAR02158.009	Sediment	Dark grey slightly gravelly SAND
A10_DP2312	MAR02158.010	Sediment	Dark grey slightly gravelly SAND
B01_DP2312	MAR02158.011	Sediment	Dark grey silty organic CLAY
B02_DP2312	MAR02158.012	Sediment	Dark grey silty organic CLAY
B03_DP2312	MAR02158.013	Sediment	Dark grey organic clayey SILT
B04_DP2312	MAR02158.014	Sediment	Dark grey organic SILT
B05_DP2312	MAR02158.015	Sediment	Dark grey organic clayey SILT
B06_DP2312	MAR02158.016	Sediment	Dark grey slightly sandy clayey SILT
B07_DP2312	MAR02158.017	Sediment	Dark grey slightly clayey SAND
B08_DP2312	MAR02158.018	Sediment	Dark grey silty SAND
B09_DP2312	MAR02158.019	Sediment	Dark grey gravelly SAND
C01_DP2312	MAR02158.020	Sediment	Dark grey organic clayey SILT
C02_DP2312	MAR02158.021	Sediment	Dark grwey organic clayey SILT
C03_DP2312	MAR02158.022	Sediment	Dark grey orgnic clayey SILT
C04_DP2312	MAR02158.023	Sediment	Dark grey organic clayey SILT
C05_DP2312	MAR02158.024	Sediment	Dark grey silty SAND
C06_DP2312	MAR02158.025	Sediment	Dark grey silty SAND
C07_DP2312	MAR02158.026	Sediment	Dark grey silty SAND
C08_DP2312	MAR02158.027	Sediment	Dark grey silty SAND
C09_DP2312	MAR02158.028	Sediment	Dark grey slightly gravelly SAND
D01_DP2312	MAR02158.029	Sediment	Dark grey clayey SILT
D02_DP2312	MAR02158.030	Sediment	Dark grey slightly sandy silty CLAY

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Method No	SUB_02*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Visual Description**
D03_DP2312	MAR02158.031	Sediment	Dark grey silty SAND
D04_DP2312	MAR02158.032	Sediment	Dark grey silty SAND
D05_DP2312	MAR02158.033	Sediment	Dark grey silty SAND
D06_DP2312	MAR02158.034	Sediment	Dark grey slightly silty SAND. Contains shell fragments
D07_DP2312	MAR02158.035	Sediment	Dark grey silty SAND
D08_DP2312	MAR02158.036	Sediment	Dark grey slightly silty SAND. Contains shell fragments
D09_DP2312	MAR02158.037	Sediment	Dark grey slightly gravelly silty SAND
D10_DP2312	MAR02158.038	Sediment	Grey slightly gravelly SAND

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	%	%	%	%	%	Mg/m3
		Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
		Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
		Accreditation	UKAS	UKAS	N	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Particle Density**
A01_DPC2312	MAR02158.001	Sediment	48.4	51.6	0.00	44.88	55.12	2.80
A02_DPC2312	MAR02158.002	Sediment	56.7	43.3	0.00	32.73	67.27	2.72
A03_DPC2312	MAR02158.003	Sediment	56.5	43.5	0.00	26.66	73.34	2.80
A04_DPC2312	MAR02158.004	Sediment	55.7	44.3	0.00	34.04	65.96	2.70
A05_DP2312	MAR02158.005	Sediment	36.0	64.0	0.00	67.96	32.04	2.71
A06_DP2312	MAR02158.006	Sediment	50.8	49.2	2.60	51.18	46.22	2.65
A07_DP2312	MAR02158.007	Sediment	34.7	65.3	0.00	70.51	29.49	2.65
A08_DP2312	MAR02158.008	Sediment	31.6	68.4	0.00	85.97	14.03	2.68
A09_DP2312	MAR02158.009	Sediment	36.5	63.5	13.98	62.65	23.36	2.61
A10_DP2312	MAR02158.010	Sediment	33.9	66.1	0.00	86.38	13.62	2.60
B01_DP2312	MAR02158.011	Sediment	41.8	58.2	0.00	47.35	52.65	2.63
B02_DP2312	MAR02158.012	Sediment	52.6	47.4	0.00	31.68	68.32	2.61
B03_DP2312	MAR02158.013	Sediment	54.4	45.6	0.00	33.00	67.00	2.63
B04_DP2312	MAR02158.014	Sediment	53.5	46.5	0.00	37.69	62.31	2.59
B05_DP2312	MAR02158.015	Sediment	50.2	49.8	0.00	47.82	52.18	2.57
B06_DP2312	MAR02158.016	Sediment	37.1	62.9	0.00	66.33	33.67	2.65
B07_DP2312	MAR02158.017	Sediment	35.7	64.3	0.00	78.46	21.54	2.66
B08_DP2312	MAR02158.018	Sediment	33.4	66.6	0.00	84.85	15.15	2.64
B09_DP2312	MAR02158.019	Sediment	47.1	52.9	42.26	44.64	13.09	2.63
C01_DP2312	MAR02158.020	Sediment	46.8	53.2	0.00	47.50	52.50	2.72
C02_DP2312	MAR02158.021	Sediment	63.2	36.8	0.00	40.00	60.00	2.64
C03_DP2312	MAR02158.022	Sediment	61.9	38.1	0.00	34.44	65.56	2.63
C04_DP2312	MAR02158.023	Sediment	68.5	31.5	0.00	44.36	55.64	2.62
C05_DP2312	MAR02158.024	Sediment	39.2	60.8	0.00	68.95	31.05	2.68
C06_DP2312	MAR02158.025	Sediment	30.1	69.9	0.00	72.24	27.76	2.59
C07_DP2312	MAR02158.026	Sediment	30.9	69.1	6.48	78.47	15.05	2.68
C08_DP2312	MAR02158.027	Sediment	32.7	67.3	3.40	76.50	20.10	2.67
C09_DP2312	MAR02158.028	Sediment	32.6	67.4	48.90	44.55	6.56	2.65
D01_DP2312	MAR02158.029	Sediment	52.4	47.6	0.00	34.90	65.10	2.67
D02_DP2312	MAR02158.030	Sediment	66.3	33.7	0.00	40.63	59.37	2.65
D03_DP2312	MAR02158.031	Sediment	52.5	47.5	0.00	31.69	68.31	2.77
D04_DP2312	MAR02158.032	Sediment	54.8	45.2	0.00	36.85	63.15	2.64

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

			Units	%	%	%	%	%	Mg/m3
			Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*
			Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A
			Accreditation	UKAS	UKAS	N	N	N	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**		**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Particle Density**
D05_DP2312	MAR02158.033	Sediment		33.1	66.9	1.23	72.18	26.58	2.72
D06_DP2312	MAR02158.034	Sediment		27.8	72.2	14.56	74.14	11.30	2.63
D07_DP2312	MAR02158.035	Sediment		19.0	81.0	8.33	83.92	7.76	2.71
D08_DP2312	MAR02158.036	Sediment		31.4	68.6	5.34	75.44	19.22	2.67
D09_DP2312	MAR02158.037	Sediment		31.5	68.5	55.68	39.08	5.24	2.65
D10_DP2312	MAR02158.038	Sediment		23.9	76.1	29.97	68.21	1.82	2.74
			Reference Material (% Recovery)	NA	NA	NA	NA	NA	NA
			QC Blank	NA	NA	NA	NA	NA	NA

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	% m/m	%m/m
		Method No	WSLM59*	ANC*
		Limit of Detection	0.02	0.12
		Accreditation	UKAS	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**TOC**	**Carbonate Equivalent (%CO3)**
A01_DPC2312	MAR02158.001	Sediment	1.77	6.0
A02_DPC2312	MAR02158.002	Sediment	2.21	10.3
A03_DPC2312	MAR02158.003	Sediment	2.07	10.3
A04_DPC2312	MAR02158.004	Sediment	2.57	8.4
A05_DP2312	MAR02158.005	Sediment	1.04	3.84
A06_DP2312	MAR02158.006	Sediment	1.99	6.7
A07_DP2312	MAR02158.007	Sediment	1.05	3.1
A08_DP2312	MAR02158.008	Sediment	0.56	4.3
A09_DP2312	MAR02158.009	Sediment	2.20	4.3
A10_DP2312	MAR02158.010	Sediment	0.84	3.1
B01_DP2312	MAR02158.011	Sediment	1.47	6.7
B02_DP2312	MAR02158.012	Sediment	2.30	10.1
B03_DP2312	MAR02158.013	Sediment	2.24	11.3
B04_DP2312	MAR02158.014	Sediment	1.09	9.4
B05_DP2312	MAR02158.015	Sediment	3.43	5.28
B06_DP2312	MAR02158.016	Sediment	2.02	4.8
B07_DP2312	MAR02158.017	Sediment	2.08	3.8
B08_DP2312	MAR02158.018	Sediment	0.67	7.4
B09_DP2312	MAR02158.019	Sediment	1.56	6.5
C01_DP2312	MAR02158.020	Sediment	0.20	10.3
C02_DP2312	MAR02158.021	Sediment	3.03	10.6
C03_DP2312	MAR02158.022	Sediment	2.83	12.0
C04_DP2312	MAR02158.023	Sediment	3.38	12.5
C05_DP2312	MAR02158.024	Sediment	1.21	4.56
C06_DP2312	MAR02158.025	Sediment	1.03	9.4
C07_DP2312	MAR02158.026	Sediment	0.76	5.8
C08_DP2312	MAR02158.027	Sediment	0.66	6.72
C09_DP2312	MAR02158.028	Sediment	0.60	11.8
D01_DP2312	MAR02158.029	Sediment	2.09	9.36
D02_DP2312	MAR02158.030	Sediment	3.03	11.8
D03_DP2312	MAR02158.031	Sediment	2.44	14.2
D04_DP2312	MAR02158.032	Sediment	2.64	9.8

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	% m/m	%m/m
		Method No	WSLM59*	ANC*
		Limit of Detection	0.02	0.12
		Accreditation	UKAS	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**TOC**	**Carbonate Equivalent (%CO3)**
D05_DP2312	MAR02158.033	Sediment	0.76	6.5
D06_DP2312	MAR02158.034	Sediment	0.51	7.0
D07_DP2312	MAR02158.035	Sediment	0.46	4.80
D08_DP2312	MAR02158.036	Sediment	0.77	6.2
D09_DP2312	MAR02158.037	Sediment	0.60	8.40
D10_DP2312	MAR02158.038	Sediment	0.52	12.5
		Reference Material (% Recovery)	93	99
		QC Blank	<0.02	<0.12

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
A01_DPC2312	MAR02158.001	Sediment	10.6	0.46	57.6	34.5	33.8	0.10	24.4
A02_DPC2312	MAR02158.002	Sediment	13.8	0.64	75.0	49.3	40.1	0.08	31.7
A03_DPC2312	MAR02158.003	Sediment	13.3	0.58	74.2	38.3	39.7	0.07	31.4
A04_DPC2312	MAR02158.004	Sediment	11.7	0.58	68.1	44.7	44.6	0.12	29.6
A05_DP2312	MAR02158.005	Sediment	9.5	0.34	50.3	39.6	48.9	0.05	15.8
A06_DP2312	MAR02158.006	Sediment	9.2	0.47	59.9	43.9	34.1	0.04	24.2
A07_DP2312	MAR02158.007	Sediment	9.1	0.32	46.0	25.6	24.4	0.01	16.2
A08_DP2312	MAR02158.008	Sediment	7.1	0.18	22.8	10.0	14.3	<0.01	11.7
A09_DP2312	MAR02158.009	Sediment	9.7	0.40	39.2	30.9	40.3	0.13	17.4
A10_DP2312	MAR02158.010	Sediment	7.9	0.19	31.3	19.0	39.7	<0.01	12.5
B01_DP2312	MAR02158.011	Sediment	8.3	0.36	48.5	26.6	30.2	0.04	18.4
B02_DP2312	MAR02158.012	Sediment	13.6	0.71	74.7	51.8	42.3	0.05	32.5
B03_DP2312	MAR02158.013	Sediment	14.2	0.62	68.1	43.5	38.9	0.06	29.7
B04_DP2312	MAR02158.014	Sediment	12.7	0.71	72.0	55.4	42.3	0.10	30.5
B05_DP2312	MAR02158.015	Sediment	11.4	0.47	47.8	38.1	41.7	0.17	22.5
B06_DP2312	MAR02158.016	Sediment	10.4	0.39	41.7	33.6	39.2	0.15	18.9
B07_DP2312	MAR02158.017	Sediment	9.3	0.20	25.5	15.4	19.6	0.01	12.0
B08_DP2312	MAR02158.018	Sediment	6.3	0.19	26.6	13.8	17.2	<0.01	10.9
B09_DP2312	MAR02158.019	Sediment	11.0	0.36	28.9	29.4	19.3	<0.01	15.3
C01_DP2312	MAR02158.020	Sediment	11.6	0.40	48.1	33.8	35.4	0.12	20.9
C02_DP2312	MAR02158.021	Sediment	18.3	0.77	72.9	68.4	45.5	0.14	31.2
C03_DP2312	MAR02158.022	Sediment	18.6	0.75	81.8	67.5	46.7	0.10	35.3
C04_DP2312	MAR02158.023	Sediment	18.6	0.80	73.0	77.7	46.6	0.12	31.6
C05_DP2312	MAR02158.024	Sediment	10.2	0.22	27.2	18.2	25.6	<0.01	12.4
C06_DP2312	MAR02158.025	Sediment	10.9	0.23	26.5	19.1	21.8	<0.01	12.7
C07_DP2312	MAR02158.026	Sediment	9.2	0.16	28.7	12.5	22.5	<0.01	9.9
C08_DP2312	MAR02158.027	Sediment	8.3	0.14	22.1	12.8	16.3	<0.01	9.8
C09_DP2312	MAR02158.028	Sediment	10.7	0.19	18.1	26.1	18.6	<0.01	10.5
D01_DP2312	MAR02158.029	Sediment	13.5	0.55	63.4	43.5	41.4	0.11	27.0
D02_DP2312	MAR02158.030	Sediment	17.4	0.76	71.6	69.5	46.3	0.10	31.3
D03_DP2312	MAR02158.031	Sediment	15.8	0.67	76.0	50.1	47.1	0.07	34.0
D04_DP2312	MAR02158.032	Sediment	14.4	0.63	68.0	57.4	41.1	0.07	30.6

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
D05_DP2312	MAR02158.033	Sediment	8.9	0.17	23.1	15.1	19.2	<0.01	11.1
D06_DP2312	MAR02158.034	Sediment	8.9	0.12	24.4	8.6	17.1	<0.01	10.0
D07_DP2312	MAR02158.035	Sediment	9.2	0.12	18.7	9.2	20.4	<0.01	9.9
D08_DP2312	MAR02158.036	Sediment	8.4	0.17	23.5	14.8	17.4	<0.01	10.8
D09_DP2312	MAR02158.037	Sediment	10.8	0.38	49.4	14.7	16.0	<0.01	18.6
D10_DP2312	MAR02158.038	Sediment	9.9	0.12	24.6	10.0	34.0	<0.01	14.4
Certified Reference Material 2702 (Measured Value)			39.77	0.894	285.1	102.2	110.3	0.542	66.76
Certified Reference Material 2702 (Certified Value)			45.3	0.817	352	117.7	132.8	0.447	75.4
Certified Reference Material 2702 (% Recovery)			105	76	88	96	88	91	98
QC Blank			<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

* See Report Notes

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

SOCOTEC

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
A01_DPC2312	MAR02158.001	Sediment	116	45400	41.8
A02_DPC2312	MAR02158.002	Sediment	160	59800	53.8
A03_DPC2312	MAR02158.003	Sediment	138	61400	55.3
A04_DPC2312	MAR02158.004	Sediment	145	53000	50.5
A05_DP2312	MAR02158.005	Sediment	606	34000	31.7
A06_DP2312	MAR02158.006	Sediment	140	48400	45.7
A07_DP2312	MAR02158.007	Sediment	82.2	36500	30.1
A08_DP2312	MAR02158.008	Sediment	48.2	25700	20.0
A09_DP2312	MAR02158.009	Sediment	90.4	31100	28.9
A10_DP2312	MAR02158.010	Sediment	60.5	26300	23.0
B01_DP2312	MAR02158.011	Sediment	91.0	37100	33.6
B02_DP2312	MAR02158.012	Sediment	160	62700	56.5
B03_DP2312	MAR02158.013	Sediment	143	58100	53.3
B04_DP2312	MAR02158.014	Sediment	167	54700	50.6
B05_DP2312	MAR02158.015	Sediment	114	40900	39.3
B06_DP2312	MAR02158.016	Sediment	100	38400	34.6
B07_DP2312	MAR02158.017	Sediment	55.5	28000	23.6
B08_DP2312	MAR02158.018	Sediment	50.6	27700	21.0
B09_DP2312	MAR02158.019	Sediment	77.2	27500	24.0
C01_DP2312	MAR02158.020	Sediment	108	42500	39.4
C02_DP2312	MAR02158.021	Sediment	201	59000	54.3
C03_DP2312	MAR02158.022	Sediment	197	60500	56.1
C04_DP2312	MAR02158.023	Sediment	213	59100	53.7
C05_DP2312	MAR02158.024	Sediment	61.2	33900	29.9
C06_DP2312	MAR02158.025	Sediment	61.0	30400	33.2
C07_DP2312	MAR02158.026	Sediment	52.1	28000	23.4
C08_DP2312	MAR02158.027	Sediment	43.0	25400	25.9
C09_DP2312	MAR02158.028	Sediment	63.9	24400	20.4
D01_DP2312	MAR02158.029	Sediment	142	53000	49.6
D02_DP2312	MAR02158.030	Sediment	203	56000	50.9
D03_DP2312	MAR02158.031	Sediment	173	63700	59.0
D04_DP2312	MAR02158.032	Sediment	176	55100	50.6

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
D05_DP2312	MAR02158.033	Sediment	52.4	29200	23.4
D06_DP2312	MAR02158.034	Sediment	37.4	27600	24.3
D07_DP2312	MAR02158.035	Sediment	37.5	29600	23.9
D08_DP2312	MAR02158.036	Sediment	48.9	27400	20.6
D09_DP2312	MAR02158.037	Sediment	55.4	36400	34.1
D10_DP2312	MAR02158.038	Sediment	38.1	25100	21.6
Certified Reference Material 2702 (Measured Value)			406.8	83124	79.79
Certified Reference Material 2702 (Certified Value)			485.3	84000	78.2
Certified Reference Material 2702 (% Recovery)			88	92	89
QC Blank			<3.5	<1750	<2

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
A01_DPC2312	MAR02158.001	Sediment	<5	<5
A02_DPC2312	MAR02158.002	Sediment	<5	<5
A03_DPC2312	MAR02158.003	Sediment	<5	<5
A04_DPC2312	MAR02158.004	Sediment	<5	<5
A05_DP2312	MAR02158.005	Sediment	<5	<5
A06_DP2312	MAR02158.006	Sediment	<5	<5
A07_DP2312	MAR02158.007	Sediment	<5	<5
A08_DP2312	MAR02158.008	Sediment	<5	<5
A09_DP2312	MAR02158.009	Sediment	<5	<5
A10_DP2312	MAR02158.010	Sediment	<5	<5
B01_DP2312	MAR02158.011	Sediment	<5	<5
B02_DP2312	MAR02158.012	Sediment	<5	<5
B03_DP2312	MAR02158.013	Sediment	<5	<5
B04_DP2312	MAR02158.014	Sediment	<5	<5
B05_DP2312	MAR02158.015	Sediment	<5	<5
B06_DP2312	MAR02158.016	Sediment	<5	<5
B07_DP2312	MAR02158.017	Sediment	<5	<5
B08_DP2312	MAR02158.018	Sediment	<5	<5
B09_DP2312	MAR02158.019	Sediment	<5	<5
Certified Reference Material BCR-646 (Measured Value)			582	307
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			76	64
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
C01_DP2312	MAR02158.020	Sediment	<5	<5
C02_DP2312	MAR02158.021	Sediment	<5	<5
C03_DP2312	MAR02158.022	Sediment	<5	<5
C04_DP2312	MAR02158.023	Sediment	<5	<5
C05_DP2312	MAR02158.024	Sediment	<5	<5
C06_DP2312	MAR02158.025	Sediment	<5	<5
C07_DP2312	MAR02158.026	Sediment	<5	<5
C08_DP2312	MAR02158.027	Sediment	<5	<5
C09_DP2312	MAR02158.028	Sediment	<5	<5
D01_DP2312	MAR02158.029	Sediment	15.0	<5
D02_DP2312	MAR02158.030	Sediment	<5	<5
D03_DP2312	MAR02158.031	Sediment	<5	<5
D04_DP2312	MAR02158.032	Sediment	<5	<5
D05_DP2312	MAR02158.033	Sediment	<5	<5
D06_DP2312	MAR02158.034	Sediment	<5	<5
D07_DP2312	MAR02158.035	Sediment	<5	<5
D08_DP2312	MAR02158.036	Sediment	<5	<5
D09_DP2312	MAR02158.037	Sediment	<5	<5
D10_DP2312	MAR02158.038	Sediment	<5	<5
Certified Reference Material BCR-646 (Measured Value)			717	350
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			93	73
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
A01_DPC2312	MAR02158.001	Sediment	18.3	48.5	90.5	177	191	147
A02_DPC2312	MAR02158.002	Sediment	<5	33.5	44.9	104	138	132
A03_DPC2312	MAR02158.003	Sediment	15.7	89.0	73.1	219	306	254
A04_DPC2312	MAR02158.004	Sediment	34.4	104	172	357	416	295
A05_DP2312	MAR02158.005	Sediment	17.6	24.9	50.7	168	174	136
A06_DP2312	MAR02158.006	Sediment	15.0	49.3	96.0	289	253	191
A07_DP2312	MAR02158.007	Sediment	9.31	21.3	47.9	143	171	130
A08_DP2312	MAR02158.008	Sediment	<5	9.8	22.6	41.6	53.5	36.3
A09_DP2312	MAR02158.009	Sediment	45.4	388	344	1090	1560	811
A10_DP2312	MAR02158.010	Sediment	<5	26.8	57.7	237	271	191
B01_DP2312	MAR02158.011	Sediment	16.6	35.8	58.3	170	217	185
B02_DP2312	MAR02158.012	Sediment	14.6	76.3	68.2	185	259	213
B03_DP2312	MAR02158.013	Sediment	14.1	80.9	77.3	215	307	237
B04_DP2312	MAR02158.014	Sediment	21.9	89.7	94.1	247	325	274
B05_DP2312	MAR02158.015	Sediment	142	730	877	1800	1950	1190
B06_DP2312	MAR02158.016	Sediment	428	4820	2550	29900	21200	10700
B07_DP2312	MAR02158.017	Sediment	20.0	107	122	251	396	302
B08_DP2312	MAR02158.018	Sediment	<5	45.2	71.0	309	338	251
B09_DP2312	MAR02158.019	Sediment	11.9	37.0	45.2	128	161	121
Certified Reference Material Nist 1941b (Measured Value)			24.8	60.4	127	215	194	407
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			65	113	69	64	54	90
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
A01_DPC2312	MAR02158.001	Sediment	107	165	163	22.2	228	49.0
A02_DPC2312	MAR02158.002	Sediment	100	127	121	22.5	145	36.7
A03_DPC2312	MAR02158.003	Sediment	196	256	211	42.1	252	58.9
A04_DPC2312	MAR02158.004	Sediment	217	334	343	51.2	414	92.6
A05_DP2312	MAR02158.005	Sediment	80.3	148	155	20.1	281	28.9
A06_DP2312	MAR02158.006	Sediment	115	210	258	26.1	331	62.3
A07_DP2312	MAR02158.007	Sediment	76.8	146	134	18.4	263	26.2
A08_DP2312	MAR02158.008	Sediment	25.0	47.0	40.8	<5	56	14.6
A09_DP2312	MAR02158.009	Sediment	521	995	684	144	569	85.8
A10_DP2312	MAR02158.010	Sediment	126	204	242	30.7	323	13.7
B01_DP2312	MAR02158.011	Sediment	123	190	162	29.6	170	34.4
B02_DP2312	MAR02158.012	Sediment	157	208	194	35.5	202	55.7
B03_DP2312	MAR02158.013	Sediment	191	244	221	44.2	211	53.3
B04_DP2312	MAR02158.014	Sediment	193	261	251	40.9	316	67.6
B05_DP2312	MAR02158.015	Sediment	752	1460	1750	157	2590	281
B06_DP2312	MAR02158.016	Sediment	5720	14500	24600	1480	18000	850
B07_DP2312	MAR02158.017	Sediment	171	316	254	44.7	424	96.7
B08_DP2312	MAR02158.018	Sediment	168	272	299	47.7	293	25.4
B09_DP2312	MAR02158.019	Sediment	81.5	126	110	21.4	137	31.0
Certified Reference Material Nist 1941b (Measured Value)			191	317	340	52.4	515	46.3
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			62	141	85	99	79	54
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
A01_DPC2312	MAR02158.001	Sediment	106	46.4	113	515	304000
A02_DPC2312	MAR02158.002	Sediment	107	43.8	88.4	177	472000
A03_DPC2312	MAR02158.003	Sediment	202	51.3	116	389	430000
A04_DPC2312	MAR02158.004	Sediment	231	81.3	234	690	473000
A05_DP2312	MAR02158.005	Sediment	90.7	20.3	142	307	185000
A06_DP2312	MAR02158.006	Sediment	123	40.5	179	565	346000
A07_DP2312	MAR02158.007	Sediment	93.2	21.7	89.6	334	172000
A08_DP2312	MAR02158.008	Sediment	24.8	16.9	47.0	88.0	95300
A09_DP2312	MAR02158.009	Sediment	567	126	380	3040	314000
A10_DP2312	MAR02158.010	Sediment	123	18.8	89.0	365	116000
B01_DP2312	MAR02158.011	Sediment	121	31.9	97.1	336	230000
B02_DP2312	MAR02158.012	Sediment	159	44.0	95.9	283	464000
B03_DP2312	MAR02158.013	Sediment	191	50.5	106	307	612000
B04_DP2312	MAR02158.014	Sediment	192	55.1	180	434	546000
B05_DP2312	MAR02158.015	Sediment	724	273	1300	4450	657000
B06_DP2312	MAR02158.016	Sediment	5700	1520	2750	71500	1610000
B07_DP2312	MAR02158.017	Sediment	177	73.5	266	645	230000
B08_DP2312	MAR02158.018	Sediment	184	37.6	84.5	388	125000
B09_DP2312	MAR02158.019	Sediment	85.1	43.6	75.3	281	419000
		Certified Reference Material Nist 1941b (Measured Value)	232	474	314	397	1409
		Certified Reference Material Nist 1941b (Certified Value)	341	848	406	581	1400
		Certified Reference Material Nist 1941b (% Recovery)	68	56	77	68	101
		QC Blank	<1	<1	<1	<1	<100

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

* See Report Notes

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
C01_DP2312	MAR02158.020	Sediment	22.4	53.6	71.4	259	328	301
C02_DP2312	MAR02158.021	Sediment	16.7	83.5	82.6	198	276	282
C03_DP2312	MAR02158.022	Sediment	<5	95.8	87.6	209	315	297
C04_DP2312	MAR02158.023	Sediment	9.79	42.5	39.1	84.8	139	129
C05_DP2312	MAR02158.024	Sediment	11.3	29.3	50.9	210	236	175
C06_DP2312	MAR02158.025	Sediment	17.0	43.0	85.2	290	310	246
C07_DP2312	MAR02158.026	Sediment	38.2	25.2	107	425	486	401
C08_DP2312	MAR02158.027	Sediment	21.3	18.0	63.8	135	149	127
C09_DP2312	MAR02158.028	Sediment	<5	19.1	23.3	75.5	103	67.2
D01_DP2312	MAR02158.029	Sediment	46.9	109	144	351	474	412
D02_DP2312	MAR02158.030	Sediment	8.93	23.8	18.2	54.6	76.4	66.2
D03_DP2312	MAR02158.031	Sediment	18.9	70.0	80.6	191	247	218
D04_DP2312	MAR02158.032	Sediment	14.9	68.4	74.8	184	260	228
D05_DP2312	MAR02158.033	Sediment	<5	14.4	28.7	31.7	35.0	26.8
D06_DP2312	MAR02158.034	Sediment	<5	<5	<5	14.6	18.4	14.4
D07_DP2312	MAR02158.035	Sediment	<5	<5	<5	11.0	14.2	11.4
D08_DP2312	MAR02158.036	Sediment	<5	28.9	28.5	80.1	95.5	73.0
D09_DP2312	MAR02158.037	Sediment	<5	9.54	9.54	15.5	27.4	17.7
D10_DP2312	MAR02158.038	Sediment	<5	<5	<5	11.4	16.0	10.3
Certified Reference Material Nist 1941b (Measured Value)			35.5	60.4	127	237	231	403
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			93	113	69	71	65	89
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
C01_DP2312	MAR02158.020	Sediment	199	270	252	45.5	350	46.6
C02_DP2312	MAR02158.021	Sediment	191	227	216	38.3	212	55.9
C03_DP2312	MAR02158.022	Sediment	218	283	235	43.0	236	56.1
C04_DP2312	MAR02158.023	Sediment	99.3	116	101	22.5	109	27.6
C05_DP2312	MAR02158.024	Sediment	124	184	207	30.1	336	23.7
C06_DP2312	MAR02158.025	Sediment	148	250	273	35.3	504	37.5
C07_DP2312	MAR02158.026	Sediment	247	362	452	64.9	826	41.4
C08_DP2312	MAR02158.027	Sediment	81.5	125	147	19.3	267	26.7
C09_DP2312	MAR02158.028	Sediment	37.9	81.2	65.2	<5	72.2	16.3
D01_DP2312	MAR02158.029	Sediment	299	376	354	69.2	490	90.2
D02_DP2312	MAR02158.030	Sediment	54.3	65.5	60.4	9.9	73	16.7
D03_DP2312	MAR02158.031	Sediment	166	218	190	37.3	233	58.6
D04_DP2312	MAR02158.032	Sediment	174	220	191	39.0	241	52.7
D05_DP2312	MAR02158.033	Sediment	22.4	32.4	32.0	<5	56.5	20.1
D06_DP2312	MAR02158.034	Sediment	11.4	18.1	15.4	<5	15.1	<5
D07_DP2312	MAR02158.035	Sediment	8.30	12.6	11.9	<5	14.0	<5
D08_DP2312	MAR02158.036	Sediment	46.0	80.3	78.7	11.6	103	16.2
D09_DP2312	MAR02158.037	Sediment	19.3	20.3	17.7	<5	20.6	7.55
D10_DP2312	MAR02158.038	Sediment	7.32	15.3	13.2	<5	18.7	<5
Certified Reference Material Nist 1941b (Measured Value)			225	345	359	60.9	536	48.2
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			73	154	90	115	82	57
QC Blank			<1	<1	<1	<1	<1	<1

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

Certificate of Analysis

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
C01_DP2312	MAR02158.020	Sediment	201	54.1	159	515	327000
C02_DP2312	MAR02158.021	Sediment	196	53.9	119	303	805000
C03_DP2312	MAR02158.022	Sediment	226	71.4	143	309	852000
C04_DP2312	MAR02158.023	Sediment	102	28.7	62.0	157	974000
C05_DP2312	MAR02158.024	Sediment	135	30.6	114	396	197000
C06_DP2312	MAR02158.025	Sediment	172	25.4	144	536	190000
C07_DP2312	MAR02158.026	Sediment	254	29.7	433	964	131000
C08_DP2312	MAR02158.027	Sediment	86.2	21.1	175	290	148000
C09_DP2312	MAR02158.028	Sediment	41.4	22.5	40.1	111	164000
D01_DP2312	MAR02158.029	Sediment	292	63.3	285	618	426000
D02_DP2312	MAR02158.030	Sediment	53.0	19.0	41.6	91.6	700000
D03_DP2312	MAR02158.031	Sediment	171	47.8	130	348	454000
D04_DP2312	MAR02158.032	Sediment	189	48.4	118	311	655000
D05_DP2312	MAR02158.033	Sediment	23.1	15.5	45.5	74.9	146000
D06_DP2312	MAR02158.034	Sediment	11.3	<5	9.9	31.4	64700
D07_DP2312	MAR02158.035	Sediment	8.00	6.89	<5	27.9	36300
D08_DP2312	MAR02158.036	Sediment	47.7	14.9	44.5	125	171000
D09_DP2312	MAR02158.037	Sediment	17.6	9.42	17.2	34.8	113000
D10_DP2312	MAR02158.038	Sediment	8.19	<5	<5	31.6	23400
Certified Reference Material Nist 1941b (Measured Value)			255	474	316	423	1509
Certified Reference Material Nist 1941b (Certified Value)			341	848	406	581	1400
Certified Reference Material Nist 1941b (% Recovery)			75	56	78	73	108
QC Blank			<1	<1	<1	<1	<100

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

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
A01_DPC2312	MAR02158.001	Sediment	0.41	0.29	0.22	0.28	0.27	0.33	0.21
A02_DPC2312	MAR02158.002	Sediment	0.66	0.35	0.34	0.41	0.37	0.45	0.29
A03_DPC2312	MAR02158.003	Sediment	0.62	0.42	0.41	0.40	0.43	0.46	0.27
A04_DPC2312	MAR02158.004	Sediment	1.57	1.03	0.84	0.92	0.74	1.01	0.75
A05_DP2312	MAR02158.005	Sediment	0.29	0.21	0.22	0.19	0.11	0.19	0.15
A06_DP2312	MAR02158.006	Sediment	0.40	0.35	0.21	0.25	0.30	0.35	0.21
A07_DP2312	MAR02158.007	Sediment	0.21	0.13	0.15	0.19	0.15	0.15	0.08
A08_DP2312	MAR02158.008	Sediment	0.11	0.08	<0.08	<0.08	<0.08	0.12	<0.08
A09_DP2312	MAR02158.009	Sediment	0.44	0.50	0.80	0.80	1.14	1.00	0.85
A10_DP2312	MAR02158.010	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
B01_DP2312	MAR02158.011	Sediment	0.26	0.20	0.17	0.16	0.13	0.28	0.14
B02_DP2312	MAR02158.012	Sediment	0.67	0.39	0.38	0.31	0.41	0.62	0.27
B03_DP2312	MAR02158.013	Sediment	0.88	0.52	0.41	0.55	0.45	0.66	0.38
B04_DP2312	MAR02158.014	Sediment	0.84	0.47	0.47	0.55	0.46	0.71	0.44
B05_DP2312	MAR02158.015	Sediment	1.03	0.66	0.57	0.50	0.76	0.86	0.84
B06_DP2312	MAR02158.016	Sediment	0.36	0.21	0.18	0.23	0.26	0.22	0.16
B07_DP2312	MAR02158.017	Sediment	0.16	<0.08	0.09	0.09	<0.08	0.11	<0.08
B08_DP2312	MAR02158.018	Sediment	0.11	<0.08	<0.08	<0.08	0.10	<0.08	0.16
B09_DP2312	MAR02158.019	Sediment	0.20	0.15	0.14	0.17	0.14	0.17	0.15
Certified Reference Material Nist 1941b (Measured Value)			3.00	4.87	4.89	3.68	3.42	5.67	3.23
Certified Reference Material Nist 1941b (Certified Value)			4.52	5.24	5.11	4.23	3.60	5.47	3.24
Certified Reference Material Nist 1941b (% Recovery)			66	93	96	87	95	104	100
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
C01_DP2312	MAR02158.020	Sediment	0.32	0.21	0.19	0.25	0.39	0.31	0.19
C02_DP2312	MAR02158.021	Sediment	0.74	0.47	0.45	0.43	0.58	0.65	0.19
C03_DP2312	MAR02158.022	Sediment	0.87	0.47	0.48	0.57	0.84	0.70	0.44
C04_DP2312	MAR02158.023	Sediment	0.73	0.45	0.43	0.49	0.67	0.76	0.33
C05_DP2312	MAR02158.024	Sediment	0.17	0.11	0.08	0.11	0.12	0.20	<0.08
C06_DP2312	MAR02158.025	Sediment	0.11	<0.08	<0.08	0.08	<0.08	0.14	<0.08
C07_DP2312	MAR02158.026	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
C08_DP2312	MAR02158.027	Sediment	0.10	<0.08	<0.08	0.08	<0.08	<0.08	<0.08
C09_DP2312	MAR02158.028	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
D01_DP2312	MAR02158.029	Sediment	0.48	0.33	0.29	0.33	0.30	0.49	0.28
D02_DP2312	MAR02158.030	Sediment	0.85	0.69	0.62	0.73	0.95	0.95	0.65
D03_DP2312	MAR02158.031	Sediment	0.87	0.56	0.55	0.62	0.46	0.77	0.45
D04_DP2312	MAR02158.032	Sediment	0.88	0.63	0.53	0.72	0.68	0.84	0.50
D05_DP2312	MAR02158.033	Sediment	0.12	<0.08	<0.08	0.09	0.17	0.09	0.08
D06_DP2312	MAR02158.034	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
D07_DP2312	MAR02158.035	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
D08_DP2312	MAR02158.036	Sediment	0.20	0.08	<0.08	<0.08	<0.08	0.10	<0.08
D09_DP2312	MAR02158.037	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
D10_DP2312	MAR02158.038	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Certified Reference Material Nist 1941b (Measured Value)			3.07	4.95	5.26	3.69	3.64	5.34	3.28
Certified Reference Material Nist 1941b (Certified Value)			4.52	5.24	5.11	4.23	3.60	5.47	3.24
Certified Reference Material Nist 1941b (% Recovery)			68	94	103	87	101	98	101
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	N*	N*	UKAS	UKAS	UKAS	N*	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
A01_DPC2312	MAR02158.001	Sediment	<0.1	<0.1	<0.1	0.37	0.20	0.36	0.18	1.27
A02_DPC2312	MAR02158.002	Sediment	<0.1	<0.1	<0.1	0.18	0.42	0.50	0.10	0.84
A03_DPC2312	MAR02158.003	Sediment	<0.1	<0.1	<0.1	<0.1	0.17	0.52	<0.1	1.10
A04_DPC2312	MAR02158.004	Sediment	<0.1	<0.1	<0.1	0.95	0.14	1.28	0.51	5.45
A05_DP2312	MAR02158.005	Sediment	<0.1	<0.1	<0.1	0.16	<0.1	0.22	0.41	0.56
A06_DP2312	MAR02158.006	Sediment	<0.1	<0.1	<0.1	0.21	<0.1	0.43	0.34	0.97
A07_DP2312	MAR02158.007	Sediment	<0.1	<0.1	<0.1	0.11	<0.1	0.22	0.72	0.40
A08_DP2312	MAR02158.008	Sediment	<0.1	<0.1	<0.1	0.13	<0.1	<0.1	<0.1	0.13
A09_DP2312	MAR02158.009	Sediment	0.15	0.19	<0.1	2.36	0.10	3.07	2.09	16.97
A10_DP2312	MAR02158.010	Sediment	<0.1	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	0.32
B01_DP2312	MAR02158.011	Sediment	<0.1	<0.1	<0.1	0.14	0.16	0.25	0.15	1.23
B02_DP2312	MAR02158.012	Sediment	<0.1	<0.1	<0.1	0.31	0.14	0.55	0.24	1.19
B03_DP2312	MAR02158.013	Sediment	<0.1	<0.1	<0.1	0.60	0.13	0.72	0.53	1.24
B04_DP2312	MAR02158.014	Sediment	<0.1	<0.1	<0.1	0.45	0.17	0.77	1.05	1.28
B05_DP2312	MAR02158.015	Sediment	<0.1	<0.1	<0.1	2.24	<0.1	2.27	25.7	29.4
B06_DP2312	MAR02158.016	Sediment	<0.1	<0.1	2.95	0.37	<0.1	0.49	0.44	1.47
B07_DP2312	MAR02158.017	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.20	0.55	0.67
B08_DP2312	MAR02158.018	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	0.24
B09_DP2312	MAR02158.019	Sediment	<0.1	<0.1	<0.1	0.47	<0.1	0.25	0.30	0.89
Certified Reference Material Nist 1941b (Measured Value)			35.0	27.1	27.8	36.9	6.50	2.75	0.91	3.98
Certified Reference Material Nist 1941b (Certified Value)			40.0	40.0	40.0	40.0	5.83	3.22	1.12	4.66
Certified Reference Material Nist 1941b (% Recovery)			87~	68~	70~	92~	112	85	82	85
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	N*	N*	UKAS	UKAS	UKAS	N*	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
C01_DP2312	MAR02158.020	Sediment	<0.1	<0.1	<0.1	0.34	<0.1	0.20	0.23	0.47
C02_DP2312	MAR02158.021	Sediment	<0.1	<0.1	<0.1	0.46	0.11	0.60	0.59	1.17
C03_DP2312	MAR02158.022	Sediment	<0.1	<0.1	<0.1	0.58	0.13	0.65	0.76	1.14
C04_DP2312	MAR02158.023	Sediment	<0.1	<0.1	<0.1	0.29	0.17	0.66	0.74	1.08
C05_DP2312	MAR02158.024	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	0.20	0.34
C06_DP2312	MAR02158.025	Sediment	<0.1	<0.1	<0.1	0.13	<0.1	0.13	<0.1	0.58
C07_DP2312	MAR02158.026	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C08_DP2312	MAR02158.027	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.16	0.22
C09_DP2312	MAR02158.028	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
D01_DP2312	MAR02158.029	Sediment	<0.1	<0.1	<0.1	0.19	0.12	0.51	0.47	1.11
D02_DP2312	MAR02158.030	Sediment	<0.1	0.12	0.10	0.80	0.20	0.82	0.68	1.51
D03_DP2312	MAR02158.031	Sediment	<0.1	<0.1	<0.1	0.34	0.14	0.52	<0.1	0.97
D04_DP2312	MAR02158.032	Sediment	<0.1	<0.1	<0.1	0.23	<0.1	0.66	<0.1	1.05
D05_DP2312	MAR02158.033	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.19
D06_DP2312	MAR02158.034	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.17	0.13
D07_DP2312	MAR02158.035	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.22	<0.1
D08_DP2312	MAR02158.036	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	0.19	0.35
D09_DP2312	MAR02158.037	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12
D10_DP2312	MAR02158.038	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Certified Reference Material Nist 1941b (Measured Value)			37.2	23.4	23.0	36.5	6.59	2.85	1.24	3.10
Certified Reference Material Nist 1941b (Certified Value)			40.0	40.0	40.0	40.0	5.83	3.22	1.12	4.66
Certified Reference Material Nist 1941b (% Recovery)			93~	59~	58~	91~	113	89	111	67
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

Test Report ID MAR02158
Issue Version 1
Customer Reference Dublin Power Station - Sediment Chemistry Survey

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR02158.001-038	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR02158.001-038	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR02158.001-038	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR02158.001-038	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR02158.001-038	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR02158.001-038	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR02158.001-038	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR02158.001-038	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes BHCH, GHCH, DDT) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR02158.002, .008, .010, .018, .028, .031-038	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/303/304	MAR02158.001-038	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR02158.001-038	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

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

Certificate of Analysis

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

Test Report ID	MAR02158
Issue Version	1
Customer Reference	Dublin Power Station - Sediment Chemistry Survey

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

Analyte Definitions

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

1. General Information	Applicant (company name)	
	Location (port/harbour)	
	Dredge Quantity (tonnes)	
	Permit Application Reg. No. (to be assigned by EPA)	
2. Survey Information	Survey Company	
	Sampling Date	13-15-Dec-23
	Analysing Laboratory	SOCOTEC
	Sub Contract Lab	
	Analysis Date	
3. Methods Information	Fraction analysed	<2mm
	Water content of sample (reported as %)	
	Are results reported as wet weight or dry weight?	Dry Weight
	Granulometry method	Wet and dry sieving followed by laser diffraction analysis.
	TEH method	Solvent extraction and GCFID
	Organic carbon (OC) method	High temperature combustion and IR detection
	Metals (incl. mercury & arsenic) extraction type	Hydrofluoric acid
	Methods of detection (metals, incl. mercury & arsenic)	ICPMS & ICPOES
	Organics extraction types	Solvent extraction
	Methods of detection (PCBs / PAHs / TBT / DBT)	GCMS & GCMSMS

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID
MAR02158.001	SOCOTEC UK		13/12/2023	A01_DPC2312				MAR02158
MAR02158.002	SOCOTEC UK		13/12/2023	A02_DPC2312				MAR02158
MAR02158.003	SOCOTEC UK		13/12/2023	A03_DPC2312				MAR02158
MAR02158.004	SOCOTEC UK		14/12/2023	A04_DPC2312				MAR02158
MAR02158.005	SOCOTEC UK		14/12/2023	A05_DP2312				MAR02158
MAR02158.006	SOCOTEC UK		14/12/2023	A06_DP2312				MAR02158
MAR02158.007	SOCOTEC UK		14/12/2023	A07_DP2312				MAR02158
MAR02158.008	SOCOTEC UK		14/12/2023	A08_DP2312				MAR02158
MAR02158.009	SOCOTEC UK		15/12/2023	A09_DP2312				MAR02158
MAR02158.010	SOCOTEC UK		15/12/2023	A10_DP2312				MAR02158
MAR02158.011	SOCOTEC UK		13/12/2023	B01_DP2312				MAR02158
MAR02158.012	SOCOTEC UK		13/12/2023	B02_DP2312				MAR02158
MAR02158.013	SOCOTEC UK		13/12/2023	B03_DP2312				MAR02158

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID
MAR02158.014	SOCOTEC UK		15/12/2023	B04_DP2312				MAR02158
MAR02158.015	SOCOTEC UK		14/12/2023	B05_DP2312				MAR02158
MAR02158.016	SOCOTEC UK		14/12/2023	B06_DP2312				MAR02158
MAR02158.017	SOCOTEC UK		14/12/2023	B07_DP2312				MAR02158
MAR02158.018	SOCOTEC UK		14/12/2023	B08_DP2312				MAR02158
MAR02158.019	SOCOTEC UK		15/12/2023	B09_DP2312				MAR02158
MAR02158.020	SOCOTEC UK		15/12/2023	C01_DP2312				MAR02158
MAR02158.021	SOCOTEC UK		13/12/2023	C02_DP2312				MAR02158
MAR02158.022	SOCOTEC UK		13/12/2023	C03_DP2312				MAR02158
MAR02158.023	SOCOTEC UK		15/12/2023	C04_DP2312				MAR02158
MAR02158.024	SOCOTEC UK		14/12/2023	C05_DP2312				MAR02158
MAR02158.025	SOCOTEC UK		14/12/2023	C06_DP2312				MAR02158
MAR02158.026	SOCOTEC UK		14/12/2023	C07_DP2312				MAR02158

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID
MAR02158.027	SOCOTEC UK		14/12/2023	C08_DP2312				MAR02158
MAR02158.028	SOCOTEC UK		15/12/2023	C09_DP2312				MAR02158
MAR02158.029	SOCOTEC UK		14/12/2023	D01_DP2312				MAR02158
MAR02158.030	SOCOTEC UK		13/12/2023	D02_DP2312				MAR02158
MAR02158.031	SOCOTEC UK		15/12/2023	D03_DP2312				MAR02158
MAR02158.032	SOCOTEC UK		15/12/2023	D04_DP2312				MAR02158
MAR02158.033	SOCOTEC UK		14/12/2023	D05_DP2312				MAR02158
MAR02158.034	SOCOTEC UK		14/12/2023	D06_DP2312				MAR02158
MAR02158.035	SOCOTEC UK		14/12/2023	D07_DP2312				MAR02158
MAR02158.036	SOCOTEC UK		14/12/2023	D08_DP2312				MAR02158
MAR02158.037	SOCOTEC UK		15/12/2023	D09_DP2312				MAR02158
MAR02158.038	SOCOTEC UK		15/12/2023	D10_DP2312				MAR02158

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:NIe size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}
MAR02158.001	Dark grey organic SILT	48.4	0	44.88	55.12	1.77	6	51.6	45400	0.46	0.1	10.6	57.6
MAR02158.002	Dark grey organic clayey SILT	56.7	0	32.73	67.27	2.21	10.3	43.3	59800	0.64	0.08	13.8	75
MAR02158.003	Dark grey organic clayey SILT	56.5	0	26.66	73.34	2.07	10.3	43.5	61400	0.58	0.07	13.3	74.2
MAR02158.004	Dark grey organic clayey SILT	55.7	0	34.04	65.96	2.57	8.4	44.3	53000	0.58	0.12	11.7	68.1
MAR02158.005	Dark grey slightly sandy slightly gravelly organic SILT	36	0	67.96	32.04	1.04	3.84	64	34000	0.34	0.05	9.5	50.3
MAR02158.006	Dark grey slightly sandy slightly gravelly organic SILT	50.8	2.6	51.18	46.22	1.99	6.72	49.2	48400	0.47	0.04	9.2	59.9
MAR02158.007	Dark grey sandy SILT	34.7	0	70.51	29.49	1.05	3.12	65.3	36500	0.32	0.01	9.1	46
MAR02158.008	Dark grey slightly gravelly SAND	31.6	0	85.97	14.03	0.56	4.32	68.4	25700	0.18	<0.01	7.1	22.8
MAR02158.009	Dark grey slightly gravelly SAND	36.5	13.98	62.65	23.36	2.2	4.32	63.5	31100	0.4	0.13	9.7	39.2
MAR02158.010	Dark grey slightly gravelly SAND	33.9	0	86.38	13.62	0.84	3.12	66.1	26300	0.19	<0.01	7.9	31.3
MAR02158.011	Dark grey silty organic CLAY	41.8	0	47.35	52.65	1.47	6.72	58.2	37100	0.36	0.04	8.3	48.5
MAR02158.012	Dark grey silty organic CLAY	52.6	0	31.68	68.32	2.3	10.1	47.4	62700	0.71	0.05	13.6	74.7
MAR02158.013	Dark grey organic clayey SILT	54.4	0	33	67	2.24	11.3	45.6	58100	0.62	0.06	14.2	68.1

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:NIe size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}
MAR02158.014	Dark grey organic SILT	53.5	0	37.69	62.31	1.09	9.36	46.5	54700	0.71	0.1	12.7	72
MAR02158.015	Dark grey organic clayey SILT	50.2	0	47.82	52.18	3.43	5.28	49.8	40900	0.47	0.17	11.4	47.8
MAR02158.016	Dark grey slightly sandy clayey SILT	37.1	0	66.33	33.67	2.02	4.8	62.9	38400	0.39	0.15	10.4	41.7
MAR02158.017	Dark grey slightly clayey SAND	35.7	0	78.46	21.54	2.08	3.84	64.3	28000	0.2	0.01	9.3	25.5
MAR02158.018	Dark grey silty SAND	33.4	0	84.85	15.15	0.67	7.44	66.6	27700	0.19	<0.01	6.3	26.6
MAR02158.019	Dark grey gravelly SAND	47.1	42.26	44.64	13.09	1.56	6.48	52.9	27500	0.36	<0.01	11	28.9
MAR02158.020	Dark grey organic clayey SILT	46.8	0	47.5	52.5	0.2	10.3	53.2	42500	0.4	0.12	11.6	48.1
MAR02158.021	Dark grwey organic clayey SILT	63.2	0	40	60	3.03	10.6	36.8	59000	0.77	0.14	18.3	72.9
MAR02158.022	Dark grey orgnic clayey SILT	61.9	0	34.44	65.56	2.83	12	38.1	60500	0.75	0.1	18.6	81.8
MAR02158.023	Dark grey organic clayey SILT	68.5	0	44.36	55.64	3.38	12.5	31.5	59100	0.8	0.12	18.6	73
MAR02158.024	Dark grey silty SAND	39.2	0	68.95	31.05	1.21	4.56	60.8	33900	0.22	<0.01	10.2	27.2
MAR02158.025	Dark grey silty SAND	30.1	0	72.24	27.76	1.03	9.36	69.9	30400	0.23	<0.01	10.9	26.5
MAR02158.026	Dark grey silty SAND	30.9	6.48	78.47	15.05	0.76	5.76	69.1	28000	0.16	<0.01	9.2	28.7

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Sample appearance (e.g. colour, texture, signs of life)	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:NIe size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}
MAR02158.027	Dark grey silty SAND	32.7	3.4	76.5	20.1	0.66	6.72	67.3	25400	0.14	<0.01	8.3	22.1
MAR02158.028	Dark grey slightly gravelly SAND	32.6	48.9	44.55	6.56	0.6	11.8	67.4	24400	0.19	<0.01	10.7	18.1
MAR02158.029	Dark grey clayey SILT	52.4	0	34.9	65.1	2.09	9.36	47.6	53000	0.55	0.11	13.5	63.4
MAR02158.030	Dark grey slightly sandy silty CLAY	66.3	0	40.63	59.37	3.03	11.8	33.7	56000	0.76	0.1	17.4	71.6
MAR02158.031	Dark grey silty SAND	52.5	0	31.69	68.31	2.44	14.2	47.5	63700	0.67	0.07	15.8	76
MAR02158.032	Dark grey silty SAND	54.8	0	36.85	63.15	2.64	9.84	45.2	55100	0.63	0.07	14.4	68
MAR02158.033	Dark grey silty SAND	33.1	1.23	72.18	26.58	0.76	6.48	66.9	29200	0.17	<0.01	8.9	23.1
MAR02158.034	Dark grey slightly silty SAND. Contains shell fragments	27.8	14.56	74.14	11.3	0.51	6.96	72.2	27600	0.12	<0.01	8.9	24.4
MAR02158.035	Dark grey silty SAND	19	8.33	83.92	7.76	0.46	4.8	81	29600	0.12	<0.01	9.2	18.7
MAR02158.036	Dark grey slightly silty SAND. Contains shell fragments	31.4	5.34	75.44	19.22	0.77	6.24	68.6	27400	0.17	<0.01	8.4	23.5
MAR02158.037	Dark grey slightly gravelly silty SAND	31.5	55.68	39.08	5.24	0.6	8.4	68.5	36400	0.38	<0.01	10.8	49.4
MAR02158.038	Grey slightly gravelly SAND	23.9	29.97	68.21	1.82	0.52	12.5	76.1	25100	0.12	<0.01	9.9	24.6

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}
MAR02158.001	34.5	33.8	24	116	0	0.2	<0.1	0.18	1.27	0.36		<0.005	<0.005	0.4100	0.2900
MAR02158.002	49.3	40.1	32	160	0.472	0.42	<0.1	0.1	0.84	0.5		<0.005	<0.005	0.6600	0.3500
MAR02158.003	38.3	39.7	31.4	138	0.43	0.17	<0.1	<0.1	1.1	0.52		<0.005	<0.005	0.6200	0.4200
MAR02158.004	44.7	44.6	29.6	145	0.473	0.14	<0.1	0.51	5.45	1.28		<0.005	<0.005	1.5700	1.0300
MAR02158.005	39.6	48.9	15.8	606	0.185	<0.1	<0.1	0.41	0.56	0.22		<0.005	<0.005	0.2900	0.2100
MAR02158.006	43.9	34.1	24.2	140	0.346	<0.1	<0.1	0.34	0.97	0.43		<0.005	<0.005	0.4000	0.3500
MAR02158.007	25.6	24.4	16.2	82.2	0.172	<0.1	<0.1	0.72	0.4	0.22		<0.005	<0.005	0.2100	0.1300
MAR02158.008	10	14.3	11.7	48.2	0.0953	<0.1	<0.1	<0.1	0.13	<0.1		<0.005	<0.005	0.1100	0.0800
MAR02158.009	30.9	40.3	17.4	90.4	0.314	0.1	<0.1	2.09	16.97	3.07		<0.005	<0.005	0.4400	0.5000
MAR02158.010	19	39.7	12.5	60.5	0.116	<0.1	<0.1	<0.1	0.32	<0.1		<0.005	<0.005	<0.08	<0.08
MAR02158.011	26.6	30.2	18.4	91	0.23	0.16	<0.1	0.15	1.23	0.25		<0.005	<0.005	0.2600	0.2000
MAR02158.012	51.8	42.3	32.5	160	0.464	0.14	<0.1	0.24	1.19	0.55		<0.005	<0.005	0.6700	0.3900
MAR02158.013	43.5	38.9	29.7	143	0.612	0.13	<0.1	0.53	1.24	0.72		<0.005	<0.005	0.8800	0.5200

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}
MAR02158.014	55.4	42.3	30.5	167	0.546	0.17	<0.1	1.05	1.28	0.77		<0.005	<0.005	0.8400	0.4700
MAR02158.015	38.1	41.7	22.5	114	0.657	<0.1	<0.1	25.7	29.4	2.27		<0.005	<0.005	1.0300	0.6600
MAR02158.016	33.6	39.2	18.9	100	1.61	<0.1	2.95	0.44	1.47	0.49		<0.005	<0.005	0.3600	0.2100
MAR02158.017	15.4	19.6	12.0	55.5	0.23	<0.1	<0.1	0.55	0.67	0.2		<0.005	<0.005	0.1600	<0.08
MAR02158.018	13.8	17.2	10.9	50.6	0.125	<0.1	<0.1	0.12	0.24	<0.1		<0.005	<0.005	0.1100	<0.08
MAR02158.019	29.4	19.3	15.3	77.2	0.419	<0.1	<0.1	0.3	0.89	0.25		<0.005	<0.005	0.2000	0.1500
MAR02158.020	33.8	35.4	20.9	108	0.327	<0.1	<0.1	0.23	0.47	0.2		<0.005	<0.005	0.3200	0.2100
MAR02158.021	68.4	45.5	31.2	201	0.805	0.11	<0.1	0.59	1.17	0.6		<0.005	<0.005	0.7400	0.4700
MAR02158.022	67.5	46.7	35.3	197	0.852	0.13	<0.1	0.76	1.14	0.65		<0.005	<0.005	0.8700	0.4700
MAR02158.023	77.7	46.6	31.6	213	0.974	0.17	<0.1	0.74	1.08	0.66		<0.005	<0.005	0.7300	0.4500
MAR02158.024	18.2	25.6	12.4	61.2	0.197	<0.1	<0.1	0.2	0.34	0.18		<0.005	<0.005	0.1700	0.1100
MAR02158.025	19.1	21.8	12.7	61	0.19	<0.1	<0.1	<0.1	0.58	0.13		<0.005	<0.005	0.1100	<0.08
MAR02158.026	12.5	22.5	9.9	52.1	0.131	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	DBT mg kg^{-1}	PCB 028 ug kg^{-1}	PCB 052 ug kg^{-1}
MAR02158.027	12.8	16.3	9.8	43	0.148	<0.1	<0.1	0.16	0.22	<0.1		<0.005	<0.005	0.1000	<0.08
MAR02158.028	26.1	18.6	10.5	63.9	0.164	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08
MAR02158.029	43.5	41.4	27.0	142	0.426	0.12	<0.1	0.47	1.11	0.51		<0.005	0.015	0.4800	0.3300
MAR02158.030	69.5	46.3	31.3	203	0.7	0.2	0.1	0.68	1.51	0.82		<0.005	<0.005	0.8500	0.6900
MAR02158.031	50.1	47.1	34.0	173	0.454	0.14	<0.1	<0.1	0.97	0.52		<0.005	<0.005	0.8700	0.5600
MAR02158.032	57.4	41.1	30.6	176	0.655	<0.1	<0.1	<0.1	1.05	0.66		<0.005	<0.005	0.8800	0.6300
MAR02158.033	15.1	19.2	11.1	52.4	0.146	<0.1	<0.1	<0.1	0.19	<0.1		<0.005	<0.005	0.1200	<0.08
MAR02158.034	8.6	17.1	10.0	37.4	0.0647	<0.1	<0.1	0.17	0.13	<0.1		<0.005	<0.005	<0.08	<0.08
MAR02158.035	9.2	20.4	9.9	37.5	0.0363	<0.1	<0.1	0.22	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08
MAR02158.036	14.8	17.4	10.8	48.9	0.171	<0.1	<0.1	0.19	0.35	0.11		<0.005	<0.005	0.2000	0.0800
MAR02158.037	14.7	16	18.6	55.4	0.113	<0.1	<0.1	<0.1	0.12	<0.1		<0.005	<0.005	<0.08	<0.08
MAR02158.038	10	34	14.4	38.1	0.0234	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}
MAR02158.001	0.2200	0.2700	0.3300	0.2100	0.2800	18.30	48.50	90.50	177.00	191.00	147.00	107.00	165.00	163.00	22.20
MAR02158.002	0.3400	0.3700	0.4500	0.2900	0.4100	<5	33.50	44.90	104.00	138.00	132.00	100.00	127.00	121.00	22.50
MAR02158.003	0.4100	0.4300	0.4600	0.2700	0.4000	15.70	89.00	73.10	219.00	306.00	254.00	196.00	256.00	211.00	42.10
MAR02158.004	0.8400	0.7400	1.0100	0.7500	0.9200	34.40	104.00	172.00	357.00	416.00	295.00	217.00	334.00	343.00	51.20
MAR02158.005	0.2200	0.1100	0.1900	0.1500	0.1900	17.60	24.90	50.70	168.00	174.00	136.00	80.30	148.00	155.00	20.10
MAR02158.006	0.2100	0.3000	0.3500	0.2100	0.2500	15.00	49.30	96.00	289.00	253.00	191.00	115.00	210.00	258.00	26.10
MAR02158.007	0.1500	0.1500	0.1500	0.0800	0.1900	9.31	21.30	47.90	143.00	171.00	130.00	76.80	146.00	134.00	18.40
MAR02158.008	<0.08	<0.08	0.1200	<0.08	<0.08	<5	9.81	22.60	41.60	53.50	36.30	25.00	47.00	40.80	<5
MAR02158.009	0.8000	1.1400	1.0000	0.8500	0.8000	45.4	388	344.00	1090.00	1560.00	811.00	521.00	995.00	684.00	144.00
MAR02158.010	<0.08	<0.08	<0.08	<0.08	<0.08	<5	26.80	57.70	237.00	271.00	191.00	126.00	204.00	242.00	30.70
MAR02158.011	0.1700	0.1300	0.2800	0.1400	0.1600	16.60	35.80	58.30	170.00	217.00	185.00	123.00	190.00	162.00	29.60
MAR02158.012	0.3800	0.4100	0.6200	0.2700	0.3100	14.6	76.3	68.20	185.00	259.00	213.00	157.00	208.00	194.00	35.50
MAR02158.013	0.4100	0.4500	0.6600	0.3800	0.5500	14.10	80.90	77.30	215.00	307.00	237.00	191.00	244.00	221.00	44.20

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}
MAR02158.014	0.4700	0.4600	0.7100	0.4400	0.5500	21.90	89.70	94.10	247.00	325.00	274.00	193.00	261.00	251.00	40.90
MAR02158.015	0.5700	0.7600	0.8600	0.8400	0.5000	142	730	877.00	1800.00	1950.00	1190.00	752.00	1460.00	1750.00	157.00
MAR02158.016	0.1800	0.2600	0.2200	0.1600	0.2300	428.00	4820.00	2550.00	29900.00	21200.00	10700.00	5720.00	14500.00	24600.00	1480.00
MAR02158.017	0.0900	<0.08	0.1100	<0.08	0.0900	20.00	107.00	122.00	251.00	396.00	302.00	171.00	316.00	254.00	44.70
MAR02158.018	<0.08	0.1000	<0.08	0.1600	<0.08	<5	45.2	71.00	309.00	338.00	251.00	168.00	272.00	299.00	47.70
MAR02158.019	0.1400	0.1400	0.1700	0.1500	0.1700	11.9	37	45.20	128.00	161.00	121.00	81.50	126.00	110.00	21.40
MAR02158.020	0.1900	0.3900	0.3100	0.1900	0.2500	22.4	53.6	71.40	259.00	328.00	301.00	199.00	270.00	252.00	45.50
MAR02158.021	0.4500	0.5800	0.6500	0.1900	0.4300	16.7	83.5	82.60	198.00	276.00	282.00	191.00	227.00	216.00	38.30
MAR02158.022	0.4800	0.8400	0.7000	0.4400	0.5700	<5	95.8	87.60	209.00	315.00	297.00	218.00	283.00	235.00	43.00
MAR02158.023	0.4300	0.6700	0.7600	0.3300	0.4900	9.79	42.5	39.10	84.80	139.00	129.00	99.30	116.00	101.00	22.50
MAR02158.024	0.0800	0.1200	0.2000	<0.08	0.1100	11.3	29.3	50.90	210.00	236.00	175.00	124.00	184.00	207.00	30.10
MAR02158.025	<0.08	<0.08	0.1400	<0.08	0.0800	17	43	85.20	290.00	310.00	246.00	148.00	250.00	273.00	35.30
MAR02158.026	<0.08	<0.08	<0.08	<0.08	<0.08	38.2	25.2	107.00	425.00	486.00	401.00	247.00	362.00	452.00	64.90

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}
MAR02158.027	<0.08	<0.08	<0.08	<0.08	0.0800	21.3	18	63.80	135.00	149.00	127.00	81.50	125.00	147.00	19.30
MAR02158.028	<0.08	<0.08	<0.08	<0.08	<0.08	<5	19.1	23.30	75.50	103.00	67.20	37.90	81.20	65.20	<5
MAR02158.029	0.2900	0.3000	0.4900	0.2800	0.3300	46.9	109	144.00	351.00	474.00	412.00	299.00	376.00	354.00	69.20
MAR02158.030	0.6200	0.9500	0.9500	0.6500	0.7300	8.93	23.8	18.20	54.60	76.40	66.20	54.30	65.50	60.40	9.93
MAR02158.031	0.5500	0.4600	0.7700	0.4500	0.6200	18.9	70	80.60	191.00	247.00	218.00	166.00	218.00	190.00	37.30
MAR02158.032	0.5300	0.6800	0.8400	0.5000	0.7200	14.9	68.4	74.80	184.00	260.00	228.00	174.00	220.00	191.00	39.00
MAR02158.033	<0.08	0.1700	0.0900	0.0800	0.0900	<5	14.4	28.70	31.70	35.00	26.80	22.40	32.40	32.00	<5
MAR02158.034	<0.08	<0.08	<0.08	<0.08	<0.08	<5	<5	<5	14.60	18.40	14.40	11.40	18.10	15.40	<5
MAR02158.035	<0.08	<0.08	<0.08	<0.08	<0.08	<5	<5	<5	11.00	14.20	11.40	8.30	12.60	11.90	<5
MAR02158.036	<0.08	<0.08	0.1000	<0.08	<0.08	<5	28.9	28.50	80.10	95.50	73.00	46.00	80.30	78.70	11.60
MAR02158.037	<0.08	<0.08	<0.08	<0.08	<0.08	<5	9.54	9.54	15.50	27.40	17.70	19.30	20.30	17.70	<5
MAR02158.038	<0.08	<0.08	<0.08	<0.08	<0.08	<5	<5	<5	11.40	16.00	10.30	7.32	15.30	13.20	<5

Sample ID code	PAH Flourene ug kg^{-1}	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}									
MAR02158.001	49.00	228.00	106.00	46.40	113.00	515.00									
MAR02158.002	36.70	145.00	107.00	43.80	88.40	177.00									
MAR02158.003	58.90	252.00	202.00	51.30	116.00	389.00									
MAR02158.004	92.60	414.00	231.00	81.30	234.00	690.00									
MAR02158.005	28.90	281.00	90.70	20.30	142.00	307.00									
MAR02158.006	62.30	331.00	123.00	40.50	179.00	565.00									
MAR02158.007	26.20	263.00	93.20	21.70	89.60	334.00									
MAR02158.008	14.60	56.20	24.80	16.90	47.00	88.00									
MAR02158.009	85.80	569.00	567	126	380	3040									
MAR02158.010	13.70	323.00	123.00	18.80	89.00	365.00									
MAR02158.011	34.40	170.00	121.00	31.90	97.10	336.00									
MAR02158.012	55.70	202.00	159	44	95.9	283									
MAR02158.013	53.30	211.00	191.00	50.50	106.00	307.00									

Sample ID code	PAH Flourene ug kg^{-1}	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}									
MAR02158.014	67.60	316.00	192.00	55.10	180.00	434.00									
MAR02158.015	281.00	2590.00	724	273	1300	4450									
MAR02158.016	850.00	18000.00	5700.00	1520.00	2750.00	71500.00									
MAR02158.017	96.70	424.00	177.00	73.50	266.00	645.00									
MAR02158.018	25.40	293.00	184	37.6	84.5	388									
MAR02158.019	31.00	137.00	85.1	43.6	75.3	281									
MAR02158.020	46.60	350.00	201	54.1	159	515									
MAR02158.021	55.90	212.00	196	53.9	119	303									
MAR02158.022	56.10	236.00	226	71.4	143	309									
MAR02158.023	27.60	109.00	102	28.7	62	157									
MAR02158.024	23.70	336.00	135	30.6	114	396									
MAR02158.025	37.50	504.00	172	25.4	144	536									
MAR02158.026	41.40	826.00	254	29.7	433	964									

Sample ID code	PAH Flourene ug kg^{-1}	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}									
MAR02158.027	26.70	267.00	86.2	21.1	175	290									
MAR02158.028	16.30	72.20	41.4	22.5	40.1	111									
MAR02158.029	90.20	490.00	292	63.3	285	618									
MAR02158.030	16.70	73.40	53	19	41.6	91.6									
MAR02158.031	58.60	233.00	171	47.8	130	348									
MAR02158.032	52.70	241.00	189	48.4	118	311									
MAR02158.033	20.10	56.50	23.1	15.5	45.5	74.9									
MAR02158.034	<5	15.10	11.3	<5	9.85	31.4									
MAR02158.035	<5	14.00	8	6.89	<5	27.9									
MAR02158.036	16.20	103.00	47.7	14.9	44.5	125									
MAR02158.037	7.55	20.60	17.6	9.42	17.2	34.8									
MAR02158.038	<5	18.70	8.19	<5	<5	31.6									

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}	DBT mg kg^{-1}	TBT mg kg^{-1}
CRM (measured value)	2702			102.2	406.8	0.894	0.543	110.3	39.77	285.1	66.76	79.79	83124		
CRM (certified value)	2702			117.7	485.3	0.817	0.447	132.8	45.3	352	75.4	78.2	84000		
CRM (measured value)	BCR-646													582	307
CRM (certified value)	BCR-646													770	480
CRM (measured value)	Nist 1941b														
CRM (certified value)	Nist 1941b														
CRM (measured value)															
CRM (certified value)															

Reference Type	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}	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}	PAH Benzo (b) fluoranthene ug kg^{-1}
CRM (measured value)													
CRM (certified value)													
CRM (measured value)													
CRM (certified value)													
CRM (measured value)	3	4.87	4.89	3.42	5.67	3.23	3.68	24.8	60.4	127	215	194	407
CRM (certified value)	4.52	5.24	5.11	3.6	5.47	3.24	4.23	38.4	53.3	184	335	358	453
CRM (measured value)													
CRM (certified value)													

Reference Type	PAH Benzo (ghi) perylene ug kg^{-1}	PAH Benzo (k) fluoranthene ug kg^{-1}	PAH Chrysene ug kg^{-1}	PAH Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	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}	HCB (ug kg-1)
CRM (measured value)											
CRM (certified value)											
CRM (measured value)											
CRM (certified value)											
CRM (measured value)	191	317	340	52.4	46.2	515	232	474	314	397	6.5
CRM (certified value)	307	225	399	53	85	651	341	848	406	581	5.83
CRM (measured value)											
CRM (certified value)											

Reference Type	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	Please add columns here for additional parameters		
CRM (measured value)								
CRM (certified value)								
CRM (measured value)								
CRM (certified value)								
CRM (measured value)		0.91	3.98	2.75				
CRM (certified value)		1.12	4.66	3.22				
CRM (measured value)								
CRM (certified value)								

Vibrocore Samples at proposed Wharf N

- Laboratory Results
- Results presented in EPA Format

Certificate of Analysis

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

SOCOTEC

Test Report ID MAR02318

Issue Version: Interim

Customer: Hydromaster Ltd, 7 Howley Court, Dublin Road, Oranmore, Co. Galway

Customer Reference: Dublin Port

Date Sampled: 14-May-24

Date Samples Received: 17-May-24

Test Report Date: 07-Jun-24

Condition of samples: Ambient Satisfactory

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

Authorised by: Jane Colbourne

Position: Customer Service Specialist

UKAS TESTING
1252

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Method No	SUB_02*
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Visual Description**
VC1.1	MAR02318.001	Sediment	
VC2.1	MAR02318.002	Sediment	
VC2.2	MAR02318.003	Sediment	
VC3.1	MAR02318.004	Sediment	
VC4.1	MAR02318.005	Sediment	
VC4.2	MAR02318.006	Sediment	
VC5.1	MAR02318.007	Sediment	
VC5.2	MAR02318.008	Sediment	

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

			Units	%	%	%	%	%	Mg/m3	% m/m
			Method No	ASC/SOP/303	ASC/SOP/303	SUB_01*	SUB_01*	SUB_01*	SUB_02*	WSLM59*
			Limit of Detection	0.2	0.2	N/A	N/A	N/A	N/A	0.02
			Accreditation	UKAS	UKAS	N	N	N	N	UKAS
Client Reference:		**SOCOTEC Ref:**	**Matrix**	**Total Moisture @ 120°C**	**Total Solids**	**Gravel (>2mm)**	**Sand (63-2000 µm)**	**Silt (<63 µm)**	**Particle Density**	**TOC**
VC1.1		MAR02318.001	Sediment	22.8	77.2	6.52	62.75	30.73		2.73
VC2.1		MAR02318.002	Sediment	20.2	79.8	19.67	57.98	22.35		0.29
VC2.2		MAR02318.003	Sediment	16.8	83.2	22.71	60.41	16.89		0.19
VC3.1		MAR02318.004	Sediment	14.8	85.2	18.41	64.46	17.13		0.41
VC4.1		MAR02318.005	Sediment	18.3	81.7	4.60	71.75	23.65		0.19
VC4.2		MAR02318.006	Sediment	19.0	81.0	9.50	64.31	26.20		0.33
VC5.1		MAR02318.007	Sediment	9.65	90.4	24.59	42.66	32.75		0.50
VC5.2		MAR02318.008	Sediment	17.2	82.8	23.68	63.54	12.79		0.47
			Reference Material (% Recovery)	NA	NA	NA	NA	NA		106
			QC Blank	NA	NA	NA	NA	NA		<0.02

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	%m/m
		Method No	ANC*
		Limit of Detection	0.12
		Accreditation	No
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Carbonate Equivalent (%CO3)**
VC1.1	MAR02318.001	Sediment	5.1
VC2.1	MAR02318.002	Sediment	5.2
VC2.2	MAR02318.003	Sediment	6.06
VC3.1	MAR02318.004	Sediment	11.2
VC4.1	MAR02318.005	Sediment	3.61
VC4.2	MAR02318.006	Sediment	3.4
VC5.1	MAR02318.007	Sediment	12.4
VC5.2	MAR02318.008	Sediment	17.7
		Reference Material (% Recovery)	100
		QC Blank	<0.12

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*	ICPMS-MWSED*
		Limit of Detection	0.14	0.03	1	0.7	0.6	0.01	0.4
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Arsenic as As**	**Cadmium as Cd**	**Chromium as Cr**	**Copper as Cu**	**Lead as Pb**	**Mercury as Hg**	**Nickel as Ni**
VC1.1	MAR02318.001	Sediment	10.3	0.72	35.5	31.5	65.4	0.43	18.1
VC2.1	MAR02318.002	Sediment	7.7	0.14	18.5	10.3	22.0	0.06	8.6
VC2.2	MAR02318.003	Sediment	7.2	0.11	18.8	6.2	17.7	0.03	7.2
VC3.1	MAR02318.004	Sediment	10.2	0.16	18.8	6.0	18.0	0.09	9.4
VC4.1	MAR02318.005	Sediment	7.5	0.12	23.2	7.9	24.9	0.05	9.0
VC4.2	MAR02318.006	Sediment	7.3	0.09	16.5	5.8	16.9	0.04	8.2
VC5.1	MAR02318.007	Sediment	9.1	0.17	18.5	9.3	16.0	0.04	11.4
VC5.2	MAR02318.008	Sediment	6.3	0.19	23.7	4.7	7.3	0.06	8.7
Certified Reference Material 2702 (Measured Value)			38.61	0.871	270.9	103.2	119.1	0.562	69.03
Certified Reference Material 2702 (Certified Value)			45.3	0.817	352	117.7	132.8	0.447	75.4
Certified Reference Material 2702 (% Recovery)			83	78	80	81	90	96	92
QC Blank			<0.14	<0.03	<1	<0.7	<0.6	<0.01	<0.4

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)	mg/Kg (Dry Weight)
		Method No	ICPMS-MWSED*	ICPOES-MWSED*	ICPOES-MWSED*
		Limit of Detection	3.5	1750	2
		Accreditation	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Zinc as Zn**	**Aluminium as Al**	**Lithium as Li**
VC1.1	MAR02318.001	Sediment	119	26500	39.6
VC2.1	MAR02318.002	Sediment	49.1	19400	24.7
VC2.2	MAR02318.003	Sediment	68.7	15100	19.4
VC3.1	MAR02318.004	Sediment	30.6	16500	24.5
VC4.1	MAR02318.005	Sediment	41.7	26100	30.9
VC4.2	MAR02318.006	Sediment	28.9	21300	28.6
VC5.1	MAR02318.007	Sediment	50.7	18400	25.5
VC5.2	MAR02318.008	Sediment	21.7	14300	19.7
		Certified Reference Material 2702 (Measured Value)	448.3	74702	79.14
		Certified Reference Material 2702 (Certified Value)	485.3	84000	78.2
		Certified Reference Material 2702 (% Recovery)	86	97	99
		QC Blank	<3.5	<1750	<2

* See Report Notes

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	µg/Kg (Dry Weight)	
		Method No	ASC/SOP/301	
		Limit of Detection	1	1
		Accreditation	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**Dibutyltin (DBT)**	**Tributyltin (TBT)**
VC1.1	MAR02318.001	Sediment	<5	<5
VC2.1	MAR02318.002	Sediment	<5	<5
VC2.2	MAR02318.003	Sediment	<5	<5
VC3.1	MAR02318.004	Sediment	<5	<5
VC4.1	MAR02318.005	Sediment	<5	<5
VC4.2	MAR02318.006	Sediment	<5	<5
VC5.1	MAR02318.007	Sediment	<5	<5
VC5.2	MAR02318.008	Sediment	<5	<5
Certified Reference Material BCR-646 (Measured Value)			536	332
Certified Reference Material BCR-646 (Certified Value)			770	480
Certified Reference Material BCR-646 (% Recovery)			70	69
QC Blank			<1	<1

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**ACENAPTH**	**ACENAPHY**	**ANTHRACN**	**BAA**	**BAP**	**BBF**
VC1.1	MAR02318.001	Sediment	77.2	385	500	780	860	639
VC2.1	MAR02318.002	Sediment	3.33	7.60	26.3	46.4	62.8	47.4
VC2.2	MAR02318.003	Sediment	6.76	30.0	19.4	48.8	126	89.7
VC3.1	MAR02318.004	Sediment	7.57	25.1	19.6	48.8	127	90.9
VC4.1	MAR02318.005	Sediment	1.34	4.38	5.71	18.1	28.5	22.5
VC4.2	MAR02318.006	Sediment	<1	3.28	5.04	15.9	22.2	18.4
VC5.1	MAR02318.007	Sediment	2.94	8.15	16.9	35.6	64.3	48.5
VC5.2	MAR02318.008	Sediment	<1	1.27	1.38	3.26	6.67	7.17
Certified Reference Material Nist 1941b (Measured Value)			28.3	58.2	121	231	250	431
Certified Reference Material Nist 1941b (Certified Value)			38.4	53.3	184	335	358	453
Certified Reference Material Nist 1941b (% Recovery)			74	109	66	69	70	95
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304
		Limit of Detection	1	1	1	1	1	1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**BENZGHIP**	**BKF***	**CHRYSENE***	**DBENZAH**	**FLUORANT**	**FLUORENE**
VC1.1	MAR02318.001	Sediment	473	677	725	107	1780	383
VC2.1	MAR02318.002	Sediment	32.8	46.4	42.1	8.23	76.8	10.5
VC2.2	MAR02318.003	Sediment	83.7	81.9	50.6	19.6	72.7	14.9
VC3.1	MAR02318.004	Sediment	84.8	82.1	51.4	22.3	71.6	14.4
VC4.1	MAR02318.005	Sediment	17.4	22.1	16.0	4.59	18.0	3.16
VC4.2	MAR02318.006	Sediment	12.6	16.6	14.9	3.66	18.7	3.11
VC5.1	MAR02318.007	Sediment	34.8	48.6	32.5	9.58	36.5	10.2
VC5.2	MAR02318.008	Sediment	4.79	5.09	5.25	1.31	4.16	<1
Certified Reference Material Nist 1941b (Measured Value)			244	354	349	71.6	509	50.3
Certified Reference Material Nist 1941b (Certified Value)			307	225	399	53.0	651	85.0
Certified Reference Material Nist 1941b (% Recovery)			80	157	87	135	78	59
QC Blank			<1	<1	<1	<1	<1	<1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/304	ASC/SOP/303/306
		Limit of Detection	1	1	1	1	100
		Accreditation	UKAS	UKAS	UKAS	UKAS	N
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**INDPYR**	**NAPTH**	**PHENANT**	**PYRENE**	**THC**
VC1.1	MAR02318.001	Sediment	475	67.2	1770	1790	585000
VC2.1	MAR02318.002	Sediment	37.5	6.35	36.8	117	59200
VC2.2	MAR02318.003	Sediment	94.6	8.66	45.6	98.4	39800
VC3.1	MAR02318.004	Sediment	95.1	9.86	43.9	97.5	57600
VC4.1	MAR02318.005	Sediment	21.0	2.51	5.73	26.8	38000
VC4.2	MAR02318.006	Sediment	14.0	2.56	9.03	27.3	17900
VC5.1	MAR02318.007	Sediment	40.8	11.4	25.0	75.4	41400
VC5.2	MAR02318.008	Sediment	4.64	1.44	5.18	8.06	8760
Certified Reference Material Nist 1941b (Measured Value)			344	524	306	407	1091
Certified Reference Material Nist 1941b (Certified Value)			341	848	406	581	1400
Certified Reference Material Nist 1941b (% Recovery)			101	62	75	70	78~
QC Blank			<1	<1	<1	<1	<100

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

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

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.08	0.08	0.08	0.08	0.08	0.08	0.08
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	N*	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**PCB28**	**PCB52**	**PCB101**	**PCB118**	**PCB138**	**PCB153**	**PCB180**
VC1.1	MAR02318.001	Sediment	20.7	10.4	4.56	4.61	6.93	8.50	6.75
VC2.1	MAR02318.002	Sediment	0.10	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
VC2.2	MAR02318.003	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
VC3.1	MAR02318.004	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
VC4.1	MAR02318.005	Sediment	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
VC4.2	MAR02318.006	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
VC5.1	MAR02318.007	Sediment	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
VC5.2	MAR02318.008	Sediment	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Certified Reference Material Nist 1941b (Measured Value)			3.65	5.07	4.56	4.00	3.68	5.30	3.59
Certified Reference Material Nist 1941b (Certified Value)			4.52	5.24	5.11	4.23	3.60	5.47	3.24
Certified Reference Material Nist 1941b (% Recovery)			81	97	89	94	102	97	111
QC Blank			<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

		Units	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)	µg/Kg (Dry Weight)
		Method No	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302	ASC/SOP/302
		Limit of Detection	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		Accreditation	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS	UKAS
Client Reference:	**SOCOTEC Ref:**	**Matrix**	**AHCH**	**BHCH**	**GHCH**	**DIELDRIN**	**HCB**	**DDE**	**DDT**	**DDD**
VC1.1	MAR02318.001	Sediment	0.11	0.13	0.13	13.6	0.20	7.42	14.4	23.5
VC2.1	MAR02318.002	Sediment	<0.1	<0.1	<0.1	0.14	<0.1	<0.1	<0.1	<0.1
VC2.2	MAR02318.003	Sediment	<0.1	<0.1	<0.1	0.15	<0.1	<0.1	<0.1	<0.1
VC3.1	MAR02318.004	Sediment	<0.1	<0.1	<0.1	0.10	<0.1	<0.1	<0.1	0.17
VC4.1	MAR02318.005	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VC4.2	MAR02318.006	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
VC5.1	MAR02318.007	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.27
VC5.2	MAR02318.008	Sediment	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Certified Reference Material Nist 1941b (Measured Value)			43.9	34.4	37.7	36.9	8.08	3.20	1.03	4.33
Certified Reference Material Nist 1941b (Certified Value)			40.0	40.0	40.0	40.0	5.83	3.22	1.12	4.66
Certified Reference Material Nist 1941b (% Recovery)			110	86	94	92	139	99	92	93
QC Blank			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

For full analyte name see method summaries

~ Indicates result is for an In-house Reference Material as no Certified Reference Materials are avaliable.

Certificate of Analysis

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

Test Report ID MAR02318
Issue Version Interim
Customer Reference Dublin Port

REPORT NOTES

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
WSLM59*	MAR02318.001-008	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ANC*	MAR02318.001-008	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPMS-MWSED*	MAR02318.001-008	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
ICPOES-MWSED*	MAR02318.001-008	Analysis was conducted by an internal SOCOTEC laboratory. UKAS accredited analysis by this laboratory is under UKAS number 1252.
SUB_01*	MAR02318.001-008	Analysis was conducted by an approved subcontracted laboratory.
SUB_02*	MAR02318.001-008	Analysis was conducted by an approved subcontracted laboratory.
ASC/SOP/301	MAR02318.001-008	The matrix of this sample has been found to interfere with the result for this test. The sample has therefore been diluted, but in doing so, the detection limit for this test has been elevated.
ASC/SOP/302	MAR02318.001-008	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. The remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected.However in line with our QMS policy we have removed accreditation, where applicable, from the affected analytes (PCB153) . These circumstances should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR02318.001-008	Benzo[k]fluoranthene is known to coelute with Benzo[j]fluoranthene and these peaks can not be resolved. It is believed Benzo[j]fluoranthene is present in these samples therefore it is suggested that the Benzo[k]fluoranthene results should be taken as a Benzo[k]fluoranthene (inc. Benzo[j]fluoranthene). Benzo[j]fluoranthene is not UKAS accredited. This should be taken into consideration when utilising the data.
ASC/SOP/303/304	MAR02318.001-008	Chrysene is known to coelute with Triphenylene and these peaks can not be resolved. It is believed Triphenylene is present in these samples therefore it is suggested that the Chrysene results should be taken as a Chrysene (inc. Triphenylene).This should be taken into consideration when utilising the data.

DEVIATING SAMPLE STATEMENT

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

Certificate of Analysis

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

Test Report ID	MAR02318
Issue Version	Interim
Customer Reference	Dublin Port

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

Analyte Definitions

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

1. General Information	Applicant (company name)	Dublin Port Company
	Location (port/harbour)	Dublin Port
	Dredge Quantity (tonnes)	
	Permit Application Reg. No. (to be assigned by EPA)	
2. Survey Information	Survey Company	Hydromaster Ltd
	Sampling Date	14/05/2024
	Analysing Laboratory	SOCOTEC
	Sub Contract Lab	
	Analysis Date	07/06/2024
3. Methods Information	Fraction analysed	<2mm
	Water content of sample (reported as %)	
	Are results reported as wet weight or dry weight?	Dry Weight
	Granulometry method	Wet and dry sieving followed by laser diffraction analysis.
	TEH method	Solvent extraction and GCFID
	Organic carbon (OC) method	High temperature combustion and IR detection
	Metals (incl. mercury & arsenic) extraction type	Hydrofluoric acid
	Methods of detection (metals, incl. mercury & arsenic)	ICPMS & ICPOES
	Organics extraction types	Solvent extraction
	Methods of detection (PCBs / PAHs / TBT / DBT)	GCMS & GCMSMS

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Company Name	Location	Sampling date (dd/mm/yyyy)	Sampling Location ID	Position Latitude (WGS84 decimal degrees)	Position Longitude (WGS84 decimal degrees)	Sampling depth below seabed m	Lab Report ID	Sample appearance (e.g. colour, texture, signs of life)
MAR02318.001	SOCOTEC UK	Dublin Port	14/05/2024	VC1.1	53.34212	-6.1811	1	MAR02318	
MAR02318.002	SOCOTEC UK	Dublin Port	14/05/2024	VC2.1	53.34141	-6.1828	1	MAR02318	
MAR02318.003	SOCOTEC UK	Dublin Port	14/05/2024	VC2.2	53.34141	-6.1828	2	MAR02318	
MAR02318.004	SOCOTEC UK	Dublin Port	14/05/2024	VC3.1	53.34186	-6.1826	1	MAR02318	
MAR02318.005	SOCOTEC UK	Dublin Port	14/05/2024	VC4.1	53.34133	-6.1837	1	MAR02318	
MAR02318.006	SOCOTEC UK	Dublin Port	14/05/2024	VC4.2	53.34133	-6.1837	2	MAR02318	
MAR02318.007	SOCOTEC UK	Dublin Port	14/05/2024	VC5.1	53.34161	-6.1854	1	MAR02318	
MAR02318.008	SOCOTEC UK	Dublin Port	14/05/2024	VC5.2	53.34161	-6.1854	2	MAR02318	

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	% Moisture	Particle size >2mm %	Particle size <2mm >63um %	Partic+B:Nle size <63um %	OC %	Carbonate %	Dry solids %	Al mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Cu mg kg^{-1}	Pb mg kg^{-1}	Ni mg kg^{-1}
MAR02318.001	22.8	6.52	62.75	30.73	2.73	5.14	77.2	26500	0.72	0.43	10.3	35.5	31.5	65.4	18.1
MAR02318.002	20.2	19.67	57.98	22.35	0.29	5.22	79.8	19400	0.14	0.06	7.7	18.5	10.3	22	8.6
MAR02318.003	16.8	22.71	60.41	16.89	0.19	6.06	83.2	15100	0.11	0.03	7.2	18.8	6.2	17.7	7.2
MAR02318.004	14.8	18.41	64.46	17.13	0.41	11.2	85.2	16500	0.16	0.09	10.2	18.8	6	18	9.4
MAR02318.005	18.3	4.6	71.75	23.65	0.19	3.61	81.7	26100	0.12	0.05	7.5	23.2	7.9	24.9	9.0
MAR02318.006	19	9.5	64.31	26.2	0.33	3.41	81	21300	0.09	0.04	7.3	16.5	5.8	16.9	8.2
MAR02318.007	9.65	24.59	42.66	32.75	0.5	12.4	90.4	18400	0.17	0.04	9.1	18.5	9.3	16	11.4
MAR02318.008	17.2	23.68	63.54	12.79	0.47	17.7	82.8	14300	0.19	0.06	6.3	23.7	4.7	7.3	8.7

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	Zn mg kg^{-1}	TEH g kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	TBT mg kg^{-1}	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}
MAR02318.001	119	0.585	0.2	0.13	14.4	23.5	7.42		<0.005	<0.005	20.7000	10.4000	4.5600	6.9300	8.5000
MAR02318.002	49.1	0.0592	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	0.1000	<0.08	<0.08	<0.08	<0.08
MAR02318.003	68.7	0.0398	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08	<0.08	<0.08	<0.08
MAR02318.004	30.6	0.0576	<0.1	<0.1	<0.1	0.17	<0.1		<0.005	<0.005	<0.08	<0.08	<0.08	<0.08	<0.08
MAR02318.005	41.7	0.038	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	0.0800	<0.08	<0.08	<0.08	<0.08
MAR02318.006	28.9	0.0179	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08	<0.08	<0.08	<0.08
MAR02318.007	50.7	0.0414	<0.1	<0.1	<0.1	0.27	<0.1		<0.005	<0.005	0.0800	<0.08	<0.08	<0.08	<0.08
MAR02318.008	21.7	0.009	<0.1	<0.1	<0.1	<0.1	<0.1		<0.005	<0.005	<0.08	<0.08	<0.08	<0.08	<0.08

EPA Dumping at Sea Permit Application - Material Analysis Reporting Form (Version 1.0)
Sheet 3. Results

Sample ID code	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}	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene ug kg^{-1}	PAH Naphthalene ug kg^{-1}
MAR02318.001	6.7500	4.6100	77.20	385.00	500.00	780.00	860.00	639.00	473.00	677.00	725.00	107.00	383.00	1780.00	475.00	67.20
MAR02318.002	<0.08	<0.08	3.33	7.60	26.30	46.40	62.80	47.40	32.80	46.40	42.10	8.23	10.50	76.80	37.50	6.35
MAR02318.003	<0.08	<0.08	6.76	30.00	19.40	48.80	126.00	89.70	83.70	81.90	50.60	19.60	14.90	72.70	94.60	8.66
MAR02318.004	<0.08	<0.08	7.57	25.10	19.60	48.80	127.00	90.90	84.80	82.10	51.40	22.30	14.40	71.60	95.10	9.86
MAR02318.005	<0.08	<0.08	1.34	4.38	5.71	18.10	28.50	22.50	17.40	22.10	16.00	4.59	3.16	18.00	21.00	2.51
MAR02318.006	<0.08	<0.08	<1	3.28	5.04	15.90	22.20	18.40	12.60	16.60	14.90	3.66	3.11	18.70	14.00	2.56
MAR02318.007	<0.08	<0.08	2.94	8.15	16.90	35.60	64.30	48.50	34.80	48.60	32.50	9.58	10.20	36.50	40.80	11.40
MAR02318.008	<0.08	<0.08	<1	1.27	1.38	3.26	6.67	7.17	4.79	5.09	5.25	1.31	<1	4.16	4.64	1.44

Sample ID code	PAH Phenanthrene ug kg^{-1}	PAH Pyrene ug kg^{-1}												
MAR02318.001	1770.00	1790.00												
MAR02318.002	36.80	117.00												
MAR02318.003	45.60	98.40												
MAR02318.004	43.90	97.50												
MAR02318.005	5.73	26.80												
MAR02318.006	9.03	27.30												
MAR02318.007	25.00	75.40												
MAR02318.008	5.18	8.06												

Reference Type	Reference Material	OC %	TEH g kg^{-1}	Cu mg kg^{-1}	Zn mg kg^{-1}	Cd mg kg^{-1}	Hg mg kg^{-1}	Pb mg kg^{-1}	As mg kg^{-1}	Cr mg kg^{-1}	Ni mg kg^{-1}	Li mg kg^{-1}	Al mg kg^{-1}	DBT mg kg^{-1}	TBT mg kg^{-1}
CRM (measured value)	2702			103.2	448.3	0.871	0.562	119.1	38.61	270.9	69.03	79.14	74702		
CRM (certified value)	2702			117.7	485.3	0.817	0.447	132.8	45.3	352	75.4	78.2	84000		
CRM (measured value)	BCR-646													536	332
CRM (certified value)	BCR-646													770	480
CRM (measured value)	Nist 1941b														
CRM (certified value)	Nist 1941b														
CRM (measured value)															
CRM (certified value)															

Reference Type	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}	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}
CRM (measured value)												
CRM (certified value)												
CRM (measured value)												
CRM (certified value)												
CRM (measured value)	3.65	5.07	4.56	3.68	5.3	3.59	4	28.3	58.2	121	231	250
CRM (certified value)	4.52	5.24	5.11	3.6	5.47	3.24	4.23	38.4	53.3	184	335	358
CRM (measured value)												
CRM (certified value)												

Reference Type	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 Dibenz (a,h) anthracene ug kg^{-1}	PAH Flourene ug kg^{-1}	PAH Fluoranthene ug kg^{-1}	PAH Indeno (1,2,3–cd) pyrene	PAH Naphthalene ug kg^{-1}	PAH Phenanthrene ug kg^{-1}
CRM (measured value)										
CRM (certified value)										
CRM (measured value)										
CRM (certified value)										
CRM (measured value)	431	244	354	349	71.6	50.3	509	344	524	306
CRM (certified value)	453	307	225	399	53	85	651	341	848	406
CRM (measured value)										
CRM (certified value)										

Reference Type	PAH Pyrene ug kg^{-1}	HCB (ug kg-1)	g-HCH (ug kg-1)	p,p' DDT (ug kg-1)	p,p' DDD (ug kg-1)	p,p' DDE (ug kg-1)	S DDX (ug kg-1)	Please add columns here for additional		
CRM (measured value)										
CRM (certified value)										
CRM (measured value)										
CRM (certified value)										
CRM (measured value)	407	8.08	37.7	1.03	4.33	3.2				
CRM (certified value)	581	5.83	40	1.12	4.66	3.22				
CRM (measured value)										
CRM (certified value)										