



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Sediment

REFERENCE MATERIAL

Sediment sample 45



Certificate of Analysis Sediment 45

General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model, the mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

The results of each determinand is expressed on dried sediment.

Sample information

QUASIMEME reference materials cover a range of natural Marine sediment species from contaminated waters from the North Sea and/or Mediterranean. There is no spiking, mixing or other alterations of the samples. For sample preparation the sediment samples are dried at 40 °C and milled to pass a 0.5 mm sieve.

This Sediment sample 45 of Harbor sediment from Vigo harbor, Spain is prepared for the QUASIMEME proficiency programs. The results on which the values in this report are based were taken from the periods given in the following table.

Year.Round	Program	Sample Round Id
2024.2	MS2	QOR160MS
2020.2	MS2	QOR144MS
2018.2	MS2	QOR137MS
2018.2	MS3	QPH100MS
2024.2	MS6	QSP091MS
2022.1	MS6	QSP081MS
2021.1	MS6	QSP077MS
2018.2	MS7	QBC057MS



Consensus Values MS2

Method: Chlorinated organics - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
pp'-DDE	µg/kg	1.50	0.381	25.4	50	1.52	0.249	0.067	4.49
HCB	µg/kg	0.143	0.042	29.2	44	0.149	0.028	0.008	5.50
PCB28	µg/kg	0.536	0.138	25.8	41	0.547	0.088	0.027	5.04
PCB31	µg/kg	0.510	0.127	24.9	42	0.519	0.074	0.025	4.81
PCB52	µg/kg	2.62	0.631	24.0	68	2.68	0.360	0.096	3.64
PCB101	µg/kg	5.51	1.15	20.9	68	5.52	0.775	0.175	3.17
PCB118	µg/kg	2.78	0.697	25.1	66	2.81	0.419	0.107	3.86
PCB138+PCB163	µg/kg	12.9	2.80	21.6	19	12.5	2.34	0.802	6.19
PCB153	µg/kg	13.7	3.22	23.6	69	13.6	2.35	0.484	3.55
PCB156	µg/kg	0.697	0.204	29.3	38	0.701	0.134	0.041	5.94
PCB180	µg/kg	11.6	2.63	22.6	70	11.6	1.43	0.392	3.38
PCB138	µg/kg	9.29	2.83	30.5	63	9.32	1.68	0.446	4.80
PCB44	µg/kg	1.23	0.172	14.0	12	1.27	0.099	0.062	5.07
PCB66	µg/kg	1.31	0.186	14.2	11	1.32	0.098	0.070	5.34
PCB149	µg/kg	10.4	1.66	16.0	17	10.6	0.877	0.505	4.86
PCB183	µg/kg	2.53	0.194	7.6	12	2.54	0.087	0.070	2.76
PCB187	µg/kg	6.90	0.755	10.9	13	6.97	0.500	0.262	3.80
PCB158	µg/kg	0.876	0.114	13.0	9	0.870	0.076	0.048	5.43
PCB141	µg/kg	2.24	0.273	12.2	10	2.26	0.145	0.108	4.81

Method: Carbon - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TOC	%	1.53	0.130	8.5	40	1.52	0.080	0.026	1.68

Method: Nitrogen - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PN	%	0.152	0.010	6.5	9	0.152	0.008	0.004	2.73



Indicative Values MS2

Method: Chlorinated organics - MS2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
a-HCH	µg/kg	0.040	0.033	82.4	24	0.059	0.025	0.008	21.0
g-HCH	µg/kg	0.069	0.030	44.3	30	0.073	0.020	0.007	10.1
Transnonachlor	µg/kg	0.019	0.008	42.5	7	0.020	0.005	0.004	20.1
Dieldrin	µg/kg	0.327	0.171	52.3	16	0.333	0.082	0.054	16.4
pp'-DDT	µg/kg	1.39	0.496	35.7	45	1.49	0.309	0.092	6.66
pp'-DDD	µg/kg	1.46	0.553	37.9	46	1.53	0.317	0.102	6.99
op'-DDT	µg/kg	0.164	0.084	51.0	29	0.171	0.055	0.019	11.8
b-HCH	µg/kg	0.050	0.029	58.3	23	0.068	0.019	0.008	15.2
PCB105	µg/kg	0.846	0.261	30.9	36	0.863	0.148	0.054	6.44
PCB18	µg/kg	0.257	0.078	30.5	12	0.255	0.050	0.028	11.0
PCB47	µg/kg	0.498	0.131	26.4	10	0.531	0.085	0.052	10.4
PCB49	µg/kg	1.23	0.317	25.8	12	1.16	0.201	0.114	9.31
PCB110	µg/kg	3.84	0.949	24.7	11	3.79	0.650	0.358	9.31
PCB128	µg/kg	1.04	0.274	26.3	15	1.07	0.197	0.088	8.47
PCB170	µg/kg	4.93	1.30	26.4	19	4.73	0.852	0.374	7.58
PCB151	µg/kg	3.36	1.04	30.9	9	3.26	0.620	0.433	12.9
PCB194	µg/kg	2.31	0.784	33.9	18	2.24	0.485	0.231	9.98
PCB28+PCB31	µg/kg	1.05	0.335	32.1	4	1.03	0.203	0.209	20.0



Consensus Values MS3

Method: Polycyclic aromatic hydrocarbons - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Benzo[e]pyrene	µg/kg	120	17.4	14.6	16	121	8.65	5.45	4.55
Phenanthrene	µg/kg	146	18.9	13.0	25	147	12.5	4.72	3.24
Pyrene	µg/kg	206	45.8	22.2	25	208	28.4	11.5	5.56
Benzo[g,h,i]perylene	µg/kg	120	27.9	23.3	25	122	16.6	6.98	5.84
Fluoranthene	µg/kg	237	52.4	22.1	26	242	37.0	12.9	5.42
Benzo[a]anthracene	µg/kg	117	23.7	20.3	25	118	12.0	5.92	5.08
Benzo[a]pyrene	µg/kg	132	28.3	21.4	26	138	14.8	6.94	5.24
Dibenz[a,h]anthracene	µg/kg	26.3	5.88	22.4	23	26.8	4.08	1.53	5.84
Benzo[k]fluoranthene	µg/kg	77.7	16.0	20.7	22	77.7	10.6	4.28	5.51
Anthracene	µg/kg	27.7	6.22	22.5	25	27.2	4.51	1.56	5.62
Perylene	µg/kg	46.8	5.95	12.7	15	48.1	4.12	1.92	4.10
Chrysene	µg/kg	113	24.3	21.4	20	116	15.2	6.80	5.99

Method: Carbon - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
TOC	%	1.48	0.155	10.5	13	1.49	0.090	0.054	3.62



Indicative Values MS3

Method: Polycyclic aromatic hydrocarbons - MS3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Chrysene + Triphenylene	µg/kg	136	25.7	19.0	8	132	16.6	11.4	8.38
Indeno[1,2,3-cd]pyrene	µg/kg	120	37.6	31.5	25	115	20.7	9.41	7.86
Benzo[b]fluoranthene	µg/kg	166	54.3	32.7	19	166	30.2	15.6	9.36
Naphthalene	µg/kg	30.6	9.44	30.8	21	31.1	6.10	2.58	8.40
Fluorene	µg/kg	15.8	4.59	29.0	21	15.9	3.10	1.25	7.90
Acenaphthene	µg/kg	10.8	3.62	33.4	20	11.2	2.26	1.01	9.35
Acenaphthylene	µg/kg	6.93	4.16	60.1	15	7.50	2.20	1.34	19.4
Dibenzothiophene	µg/kg	12.6	2.20	17.5	12	12.9	0.850	0.793	6.30
3-6-dimethylphenanthrene	µg/kg	6.21	1.57	25.3	7	6.30	0.810	0.741	11.9
2-methylphenanthrene	µg/kg	39.9	12.6	31.7	9	39.8	7.50	5.27	13.2
Triphenylene	µg/kg	24.3	1.36	5.6	5	24.8	0.900	0.762	3.14
Benzo[fluoranthenes (b+j)]	µg/kg	234	28.5	12.2	6	232	14.2	14.5	6.20
C1-phenanthr.+anthrac.	µg/kg	108	30.0	27.9	7	112	16.4	14.2	13.2
C2-phenanthr.+anthrac.	µg/kg	84.0	26.8	32.0	7	93.8	23.5	12.7	15.1
C3-phenanthr.+anthrac.	µg/kg	54.6	5.35	9.8	5	52.5	3.47	2.99	5.48
C1-pyrenes+fluoranthenes	µg/kg	122	26.4	21.7	5	128	17.5	14.8	12.1
C1-chrysenes	µg/kg	104	27.7	26.7	5	96.7	20.0	15.5	14.9
C2-chrysenes	µg/kg	84.5	34.3	40.6	4	86.2	21.8	21.4	25.4
C2-naphtalenes	µg/kg	76.5	51.3	67.0	6	78.1	38.3	26.2	34.2



Consensus Values MS6

Method: Organometals - MS6

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Dibutyltin (DBT)	µg Sn/kg	28.3	8.22	29.0	49	28.0	4.86	1.47	5.18



Indicative Values MS6

Method: Organometals - MS6

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Tributyltin (TBT)	µg Sn/kg	23.2	9.03	38.8	53	23.4	5.28	1.55	6.67
Monobutyltin (MBT)	µg Sn/kg	107	56.4	52.8	43	104	39.6	10.8	10.1
Triphenyltin (TPhT)	µg Sn/kg	0.556	0.512	92.0	12	0.726	0.371	0.185	33.2



Indicative Values MS7

Method: Brominated Flame Retardants - MS7

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
BDE047	µg/kg	0.020	0.011	55.2	7	0.024	0.007	0.005	26.1
BDE099	µg/kg	0.022	0.004	16.7	6	0.024	0.001	0.002	8.53
BDE100	µg/kg	0.007	0.004	50.4	4	0.008	0.002	0.002	31.5
BDE183	µg/kg	0.059	0.020	34.7	8	0.069	0.011	0.009	15.4
BDE209	µg/kg	5.16	2.28	44.1	9	5.23	1.53	0.949	18.4