



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Sediment

REFERENCE MATERIAL

Sediment sample 12



Certificate of Analysis Sediment 12

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 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 10 results while the relative uncertainty is smaller than 6.25%. Indicative Values are based on a relative uncertainty of maximum 35% with at least 4 and less than 10 results or a relative uncertainty higher than 6.25%.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation) and the uncertainty in the assigned value. The confidence limits (at 95 % probability) are calculated for these determinands.

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 oC and milled to pass a 0.5 mm sieve.

This Sediment sample 12 of Estuarine sediment from Westerscheldt, the Netherlands 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
2017.1	MS1	QTM119MS



Consensus Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-RT	%	1.12	0.128	11.4	14	1.14	0.091	0.043	1.05	-	1.19
Arsenic-RT	mg/kg	9.44	1.122	11.9	12	9.49	0.715	0.405	8.73	-	10.1
Cadmium-RT	µg/kg	41.4	6.59	15.9	11	42.7	5.08	2.48	37.0	-	45.8
Chromium-RT	mg/kg	27.9	4.93	17.7	13	28.1	3.50	1.71	24.9	-	30.8
Copper-RT	mg/kg	1.74	0.267	15.3	12	1.76	0.195	0.096	1.57	-	1.90
Iron-RT	%	1.70	0.178	10.5	14	1.72	0.125	0.059	1.60	-	1.80
Lead-RT	mg/kg	7.91	0.830	10.5	11	8.00	0.510	0.313	7.35	-	8.46
Lithium-RT	mg/kg	9.83	1.182	12.0	11	9.80	0.800	0.445	9.05	-	10.6
Manganese-RT	mg/kg	112	14.6	13.0	14	114	10.5	4.9	103	-	120
Nickel-RT	mg/kg	3.35	0.487	14.5	12	3.42	0.341	0.176	3.05	-	3.66

Method: Acid extractable (So-called totals) - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic-AE	mg/kg	8.61	1.209	14.0	20	8.65	0.850	0.338	8.04	-	9.17
Cadmium-AE	µg/kg	40.2	5.72	14.3	16	42.0	4.24	1.79	37.1	-	43.2
Chromium-AE	mg/kg	24.0	2.88	12.0	19	24.0	1.80	0.83	22.6	-	25.4
Copper-AE	mg/kg	1.28	0.205	16.1	19	1.25	0.147	0.059	1.18	-	1.38
Iron-AE	%	1.50	0.235	15.6	16	1.52	0.154	0.073	1.38	-	1.63
Lead-AE	mg/kg	5.80	0.412	7.1	20	5.68	0.270	0.115	5.60	-	5.99
Manganese-AE	mg/kg	97.9	6.81	7.0	18	99.2	4.87	2.01	94.5	-	101.2
Vanadium-AE	mg/kg	18.9	2.79	14.7	12	18.9	1.95	1.01	17.2	-	20.7
Zinc-AE	mg/kg	19.9	2.07	10.4	20	20.1	1.43	0.58	18.9	-	20.8



Indicative Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Barium-RT	mg/kg	115	9.3	8.1	4	115	6.0	5.8	102	-	128
Cobalt-RT	mg/kg	1.97	0.308	15.7	5	2.03	0.193	0.172	1.61	-	2.32
Mercury-RT	µg/kg	10.1	4.06	40.1	10	10.5	2.96	1.60	7.25	-	13.0
Vanadium-RT	mg/kg	22.9	2.78	12.2	7	23.5	2.00	1.31	20.4	-	25.3
Zinc-RT	mg/kg	20.8	3.93	18.8	14	20.3	2.75	1.31	18.6	-	23.1

Method: Acid extractable (So-called totals) - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-AE	%	0.506	0.1258	24.9	13	0.500	0.0900	0.0436	0.431	-	0.581
Barium-AE	mg/kg	4.43	0.705	15.9	5	4.47	0.500	0.394	3.62	-	5.24
Cobalt-AE	mg/kg	1.64	0.168	10.3	6	1.66	0.116	0.086	1.47	-	1.81
Lithium-AE	mg/kg	4.44	1.012	22.8	9	4.40	0.696	0.422	3.68	-	5.21
Mercury-AE	µg/kg	11.4	3.06	26.8	14	12.3	1.85	1.02	9.64	-	13.1
Nickel-AE	mg/kg	2.87	0.711	24.8	19	2.95	0.505	0.204	2.53	-	3.21
Strontium-AE	mg/kg	73.0	1.15	1.6	5	72.5	0.80	0.64	71.7	-	74.3

Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Inorganic-Carbonate	%	0.467	0.0381	8.2	5	0.470	0.0300	0.0213	0.424	-	0.511
TOC	%	0.114	0.0197	17.3	10	0.115	0.0150	0.0078	0.0999	-	0.128