



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Sediment

REFERENCE MATERIAL

Sediment sample 17



Certificate of Analysis Sediment 17

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 17 of Open sea sediment from Wadden sea, 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
2019.1	MS1	QTM126MS



Consensus Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Aluminium-RT	%	4.33	0.318	7.4	14	4.33	0.230	0.106	4.15	- 4.51
Arsenic-RT	mg/kg	17.0	1.52	8.9	14	16.8	1.04	0.51	16.2	- 17.9
Cadmium-RT	µg/kg	648	45.2	7.0	12	640	30.9	16.3	619	- 676
Chromium-RT	mg/kg	90.2	7.62	8.5	14	90.5	5.23	2.55	85.8	- 94.6
Copper-RT	mg/kg	18.1	2.07	11.5	14	17.9	1.40	0.69	16.9	- 19.3
Iron-RT	%	2.51	0.150	6.0	15	2.51	0.100	0.048	2.42	- 2.59
Lead-RT	mg/kg	55.3	5.80	10.5	14	54.4	4.18	1.94	52.0	- 58.6
Lithium-RT	mg/kg	39.8	3.05	7.7	10	39.9	2.04	1.20	37.7	- 41.9
Manganese-RT	mg/kg	431	35.6	8.3	13	433	24.5	12.4	410	- 453
Mercury-RT	µg/kg	335	24.6	7.4	13	330	17.0	8.5	320	- 350
Nickel-RT	mg/kg	28.8	2.47	8.6	15	28.4	1.81	0.80	27.5	- 30.2
Zinc-RT	mg/kg	138	4.9	3.5	14	138	3.2	1.6	135.2	- 140.8

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Arsenic-AE	mg/kg	16.3	1.21	7.4	20	16.4	0.83	0.34	15.7	- 16.9
Cadmium-AE	µg/kg	624	36.6	5.9	22	632	26.8	9.7	608	- 640
Cobalt-AE	mg/kg	7.31	0.757	10.4	10	7.38	0.505	0.299	6.78	- 7.84
Copper-AE	mg/kg	17.1	1.12	6.6	24	17.3	0.78	0.29	16.6	- 17.6
Iron-AE	%	2.25	0.184	8.2	20	2.22	0.125	0.051	2.16	- 2.33
Lead-AE	mg/kg	52.3	5.25	10.0	24	52.7	3.52	1.34	50.1	- 54.5
Lithium-AE	mg/kg	35.0	1.76	5.0	12	35.0	1.25	0.63	33.9	- 36.1
Manganese-AE	mg/kg	404	21.0	5.2	20	406	13.4	5.9	394	- 414
Mercury-AE	µg/kg	336	34.2	10.2	21	331	23.0	9.3	321	- 352
Nickel-AE	mg/kg	26.0	1.70	6.6	22	25.5	1.20	0.45	25.2	- 26.7
Zinc-AE	mg/kg	130	8.5	6.6	23	130	6.0	2.2	126.1	- 133.4

Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
TOC	%	2.72	0.216	7.9	14	2.75	0.141	0.072	2.60	- 2.85



Indicative Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Barium-RT	mg/kg	264	21.3	8.1	6	262	15.0	10.9	243	-	285
Cobalt-RT	mg/kg	8.32	0.338	4.1	5	8.20	0.250	0.189	7.93	-	8.71
Strontium-RT	mg/kg	228	12.9	5.6	5	228	8.4	7.2	213	-	243
Vanadium-RT	mg/kg	84.1	3.86	4.6	8	84.4	2.60	1.71	81.0	-	87.3

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-AE	%	2.29	1.027	44.9	16	2.39	0.710	0.321	1.74	-	2.83
Barium-AE	mg/kg	103	32.6	31.6	8	104	22.7	14.4	76.6	-	130
Calcium-AE	g/kg	54.9	1.23	2.2	4	54.8	0.80	0.77	53.2	-	56.6
Chromium-AE	mg/kg	64.2	17.88	27.9	21	67.0	12.90	4.88	56.0	-	72.3
Magnesium-AE	mg/kg	9340	269	2.9	7	9390	180	127	9104	-	9584
Molybdenum-AE	mg/kg	1.40	0.377	26.9	4	1.40	0.255	0.236	0.876	-	1.92
Phosphorus-AE	mg/kg	1010	77	7.6	6	1000	56	39	930	-	1084
Scandium-AE	mg/kg	5.40	1.946	36.0	4	5.48	1.335	1.216	2.70	-	8.10
Selenium-AE	mg/kg	0.696	0.2185	31.4	4	0.698	0.1560	0.1366	0.392	-	0.999
Strontium-AE	mg/kg	208	12.4	5.9	6	208	8.5	6.3	196	-	221
Thallium-AE	µg/kg	323	90.5	28.1	6	331	58.5	46.2	232	-	413
Uranium-AE	mg/kg	1.05	0.251	23.9	5	1.12	0.150	0.140	0.763	-	1.34
Vanadium-AE	mg/kg	58.4	14.11	24.2	14	61.0	9.80	4.71	50.3	-	66.4

Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Inorganic-Carbonate	%	1.72	0.059	3.4	7	1.73	0.046	0.028	1.66	-	1.77