QUASIMEME

Quality assurance of information for marine environmental monitoring

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Certificate of Analysis

Sediment

REFERENCE MATERIAL

Sediment sample 52

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis Sediment 52

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 % probabilty) 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 52 of Estuarine sediment from Westerschelde estuary, 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
2023.1	MS1	QTM143MS
2019.2	MS1	QTM129MS

Consensus Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Aluminium-RT	%	1.32	0.144	10.9	25	1.34	0.078	0.036	1.26 - 1.37
Arsenic-RT	mg/kg	11.8	1.30	11.0	25	11.8	0.92	0.33	11.3 - 12.3
Cadmium-RT	µg/kg	58.9	10.27	17.4	18	59.4	7.60	3.02	53.8 - 64.0
Chromium-RT	mg/kg	31.4	3.96	12.6	27	31.8	2.60	0.95	29.8 - 33.0
Copper-RT	mg/kg	2.63	0.366	13.9	27	2.69	0.180	0.088	2.49 - 2.78
Iron-RT	%	1.62	0.112	6.9	24	1.61	0.070	0.029	1.58 - 1.67
Lead-RT	mg/kg	11.5	1.68	14.6	27	11.8	1.00	0.40	10.8 - 12.1
Lithium-RT	mg/kg	11.7	1.46	12.5	20	11.6	0.77	0.41	11.0 - 12.4
Manganese-RT	mg/kg	175	17.0	9.7	22	176	9.9	4.5	167 - 182
Mercury-RT	µg/kg	21.4	3.91	18.3	23	21.7	1.73	1.02	19.7 - 23.0
Nickel-RT	mg/kg	5.29	0.811	15.3	25	5.35	0.460	0.203	4.95 - 5.62
Zinc-RT	mg/kg	27.4	2.86	10.4	27	27.3	1.95	0.69	26.3 - 28.5
Barium-RT	mg/kg	126	11.2	8.9	11	123	9.1	4.2	119 - 133
Vanadium-RT	mg/kg	27.9	2.38	8.5	17	27.5	1.80	0.72	26.7 - 29.1
Cobalt-RT	mg/kg	2.42	0.296	12.2	17	2.44	0.179	0.090	2.27 - 2.57
Strontium-RT	mg/kg	169	18.6	11.0	11	167	9.8	7.0	157 - 181

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
Aluminium-AE	%	0.657	0.1238	18.8	30	0.653	0.0735	0.0283	0.611 - 0.703
Arsenic-AE	mg/kg	11.6	1.26	10.9	40	11.5	0.81	0.25	11.16 - 11.96
Cadmium-AE	µg/kg	52.7	11.74	22.3	32	54.5	5.28	2.59	48.4 - 56.9
Chromium-AE	mg/kg	26.1	5.31	20.3	40	26.0	3.37	1.05	24.4 - 27.8
Copper-AE	mg/kg	2.00	0.456	22.8	40	2.02	0.290	0.090	1.86 - 2.15
Iron-AE	%	1.46	0.215	14.7	38	1.44	0.162	0.044	1.39 - 1.53
Lead-AE	mg/kg	8.64	1.224	14.2	43	8.74	0.840	0.233	8.27 - 9.02
Lithium-AE	mg/kg	6.80	1.260	18.5	17	6.69	0.810	0.382	6.15 - 7.44
Manganese-AE	mg/kg	161	10.2	6.3	39	160	6.6	2.0	157.6 - 164.2
Mercury-AE	µg/kg	21.8	3.58	16.4	25	22.0	2.00	0.90	20.3 - 23.3
Nickel-AE	mg/kg	4.39	0.769	17.5	42	4.50	0.470	0.148	4.15 - 4.63
Zinc-AE	mg/kg	25.4	3.17	12.5	43	25.6	2.70	0.60	24.4 - 26.4
Magnesium-AE	mg/kg	2883	369.4	12.8	13	2960	180.0	128.1	2662 - 3105
Phosphorus-AE	mg/kg	539	47.4	8.8	13	520	31.0	16.4	511 - 568
Calcium-AE	g/kg	31.8	1.49	4.7	11	31.5	0.80	0.56	30.8 - 32.7
Vanadium-AE	mg/kg	23.5	4.01	17.1	25	23.0	2.85	1.00	21.8 - 25.1
Cobalt-AE	mg/kg	2.07	0.433	20.9	20	2.08	0.200	0.121	1.87 - 2.27

Consensus Values MS1

Strontium-AE	mg/kg	154	20.5	13.3	12	154	13.5	7.4	141	-	167

Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Inorganic-Carbonate	%	0.901	0.1420	15.8	13	0.910	0.0895	0.0492	0.816	-	0.986

Indicative Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Sodium-RT	mg/kg	-	-	-	5	5100	130.0	-	-	-	-
Magnesium-RT	mg/kg	3151	1069.6	33.9	8	3235	651.5	472.7	2280	-	4020
Phosphorus-RT	mg/kg	-	-	-	4	529	19.2	-	-	-	-
Potassium-RT	mg/kg	8949	1381.9	15.4	6	8836	761.4	705.2	7570	-	10330
Titanium-RT	mg/kg	-	-	-	5	442	91.0	-	-	-	-
Cesium-RT	µg/kg	-	-	-	4	1197	11.5	-	-	-	-
Calcium-RT	g/kg	33.6	5.69	16.9	9	33.3	3.40	2.37	29.3	-	37.9
Rubidium-RT	mg/kg	34.5	1.36	3.9	7	34.2	1.09	0.64	33.3	-	35.7
Molybdenum-RT	mg/kg	-	-	-	4	0.347	0.0	-	-	-	-
Uranium-RT	mg/kg	0.785	0.1223	15.6	6	0.801	0.0865	0.0624	0.663	-	0.907

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Scandium-AE	mg/kg	-	-	-	4	1.78	0.2	-	-	-	-
Sodium-AE	mg/kg	-	-	-	4	3478	169.5	-	-	-	-
Potassium-AE	mg/kg	-	-	-	5	5460	470.0	-	-	-	-
Titanium-AE	mg/kg	-	-	-	5	103	63.9	-	-	-	-
Gallium-AE	µg/kg	-	-	-	5	2591	151.0	-	-	-	-
Barium-AE	mg/kg	12.0	5.59	46.5	16	12.3	4.58	1.75	9.06	-	15.0
Thallium-AE	µg/kg	-	-	-	5	50.0	25.0	-	-	-	-
Molybdenum-AE	mg/kg	0.291	0.0659	22.7	11	0.290	0.0260	0.0248	0.247	-	0.334
Uranium-AE	mg/kg	0.591	0.0716	12.1	6	0.595	0.0535	0.0365	0.519	-	0.662

Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
TOC	%	0.259	0.0859	33.2	21	0.280	0.0500	0.0234	0.220	-	0.298