



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Sediment

REFERENCE MATERIAL

Sediment sample 43



Certificate of Analysis Sediment 43

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 43 of Mix of two types of open sea sediment from Burbo bight Liverpool/Norwegian Trench 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	QTM142MS
2019.1	MS1	QTM127MS



Consensus Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-RT	%	4.06	0.345	8.5	27	4.04	0.210	0.083	3.93	-	4.20
Arsenic-RT	mg/kg	9.71	1.218	12.5	29	9.90	0.900	0.283	9.25	-	10.2
Chromium-RT	mg/kg	72.9	6.91	9.5	30	73.1	4.90	1.58	70.3	-	75.5
Copper-RT	mg/kg	13.3	1.29	9.7	31	13.3	0.90	0.29	12.8	-	13.8
Iron-RT	%	2.30	0.188	8.1	28	2.29	0.115	0.044	2.23	-	2.38
Lead-RT	mg/kg	33.5	2.45	7.3	32	33.3	1.59	0.54	32.6	-	34.4
Lithium-RT	mg/kg	38.2	3.32	8.7	22	38.4	2.33	0.88	36.7	-	39.7
Manganese-RT	mg/kg	467	32.8	7.0	26	468	21.1	8.0	454	-	481
Mercury-RT	µg/kg	93.6	10.88	11.6	25	95.2	8.53	2.72	89.1	-	98.1
Nickel-RT	mg/kg	30.4	2.68	8.8	32	30.2	1.58	0.59	29.5	-	31.4
Zinc-RT	mg/kg	83.6	8.68	10.4	30	83.5	5.32	1.98	80.4	-	86.9
Barium-RT	mg/kg	248	18.4	7.4	12	250	8.3	6.6	237	-	260
Vanadium-RT	mg/kg	75.6	4.73	6.3	18	76.4	3.02	1.39	73.3	-	78.0
Cobalt-RT	mg/kg	8.85	0.842	9.5	17	8.86	0.540	0.255	8.42	-	9.28
Strontium-RT	mg/kg	186	24.0	12.9	11	187	15.0	9.1	170	-	202

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic-AE	mg/kg	8.73	0.908	10.4	40	8.65	0.560	0.179	8.44	-	9.02
Cadmium-AE	µg/kg	86.7	18.90	21.8	39	86.0	11.20	3.78	80.6	-	92.8
Chromium-AE	mg/kg	52.5	12.67	24.1	43	51.1	8.07	2.42	48.6	-	56.4
Copper-AE	mg/kg	12.1	1.40	11.6	47	12.0	0.87	0.26	11.7	-	12.5
Iron-AE	%	2.09	0.176	8.4	38	2.09	0.110	0.036	2.03	-	2.15
Lead-AE	mg/kg	29.4	2.91	9.9	47	29.5	1.77	0.53	28.5	-	30.2
Lithium-AE	mg/kg	32.5	4.04	12.4	22	32.5	2.45	1.08	30.7	-	34.3
Manganese-AE	mg/kg	438	35.2	8.0	40	438	21.0	7.0	426	-	449
Mercury-AE	µg/kg	94.9	16.33	17.2	38	93.3	10.25	3.31	89.5	-	100
Nickel-AE	mg/kg	27.2	2.31	8.5	44	27.1	1.42	0.43	26.5	-	27.9
Zinc-AE	mg/kg	80.6	5.96	7.4	45	80.6	4.46	1.11	78.9	-	82.4
Magnesium-AE	mg/kg	8630	882.2	10.2	13	8700	660.0	305.9	8100	-	9160
Phosphorus-AE	mg/kg	474	41.7	8.8	15	473	29.0	13.5	451	-	497
Vanadium-AE	mg/kg	56.3	9.89	17.6	27	57.0	7.00	2.38	52.4	-	60.2
Cobalt-AE	mg/kg	8.01	0.836	10.4	22	7.94	0.600	0.223	7.64	-	8.38
Strontium-AE	mg/kg	166	14.6	8.7	15	164	10.0	4.7	158	-	174



Consensus Values MS1

Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
TOC	%	1.13	0.131	11.6	23	1.12	0.082	0.034	1.07	-	1.19
Inorganic-Carbonate	%	1.29	0.106	8.2	13	1.28	0.068	0.037	1.22	-	1.35



Indicative Values MS1

Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cadmium-RT	µg/kg	92.7	22.47	24.2	22	90.2	16.13	5.99	82.8	-	103
Sodium-RT	mg/kg	-	-	-	4	14433	2517.5	-	-	-	-
Magnesium-RT	mg/kg	9736	3121.8	32.1	7	9260	1000.1	1474.9	6950	-	12530
Phosphorus-RT	mg/kg	-	-	-	4	417	20.0	-	-	-	-
Potassium-RT	mg/kg	14459	2168.7	15.0	6	14025	1249.6	1106.7	12290	-	16620
Calcium-RT	g/kg	44.3	5.08	11.5	8	44.4	4.48	2.25	40.2	-	48.5
Rubidium-RT	mg/kg	64.6	8.87	13.7	6	65.5	5.85	4.53	55.8	-	73.5
Molybdenum-RT	mg/kg	-	-	-	4	1.80	0.2	-	-	-	-
Uranium-RT	mg/kg	-	-	-	4	1.65	0.1	-	-	-	-

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-AE	%	2.29	0.732	32.0	32	2.39	0.530	0.162	2.02	-	2.55
Scandium-AE	mg/kg	-	-	-	5	6.27	0.2	-	-	-	-
Sodium-AE	mg/kg	-	-	-	4	9595	116.0	-	-	-	-
Potassium-AE	mg/kg	-	-	-	4	9822	163.0	-	-	-	-
Titanium-AE	mg/kg	-	-	-	5	254	95.0	-	-	-	-
Gallium-AE	µg/kg	-	-	-	5	9416	1884.0	-	-	-	-
Selenium-AE	mg/kg	0.575	0.1496	26.0	7	0.668	0.1758	0.0707	0.441	-	0.709
Barium-AE	mg/kg	88.5	32.96	37.3	18	98.9	30.35	9.71	72.2	-	105
Thallium-AE	µg/kg	276	50.2	18.2	9	272	31.0	20.9	239	-	314
Calcium-AE	g/kg	41.2	2.16	5.3	9	41.1	1.10	0.90	39.5	-	42.8
Molybdenum-AE	mg/kg	1.26	0.479	38.1	11	1.22	0.300	0.181	0.941	-	1.58
Uranium-AE	mg/kg	1.04	0.158	15.2	8	1.07	0.100	0.070	0.910	-	1.17