



# QUASIMEME

Quality assurance of information  
for marine environmental monitoring

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## Certificate of Analysis



**Sediment**

**REFERENCE MATERIAL**

**Sediment sample 75**

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## Certificate of Analysis Sediment 75

### 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 75 of Estuary sediment from Westerscheldt Riland Bath 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
2022.2	MS1	QTM141MS



## Consensus Values MS1

### Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-RT	%	2.60	0.229	8.8	12	2.65	0.156	0.082	2.46	-	2.74
Arsenic-RT	mg/kg	11.6	1.18	10.2	10	11.5	0.85	0.47	10.8	-	12.4
Cadmium-RT	µg/kg	930	56.8	6.1	10	929	41.9	22.5	890	-	970
Chromium-RT	mg/kg	63.2	8.67	13.7	12	63.8	6.03	3.13	57.8	-	68.7
Copper-RT	mg/kg	16.2	1.43	8.8	11	16.3	0.88	0.54	15.3	-	17.2
Iron-RT	%	2.08	0.189	9.1	11	2.08	0.129	0.071	1.95	-	2.20
Lead-RT	mg/kg	30.2	2.77	9.2	11	30.5	1.96	1.05	28.4	-	32.1
Manganese-RT	mg/kg	363	40.8	11.2	10	363	27.5	16.1	335	-	392
Nickel-RT	mg/kg	13.0	1.28	9.8	11	13.3	0.86	0.48	12.2	-	13.9
Zinc-RT	mg/kg	122	6.7	5.4	11	120	4.9	2.5	118	-	127

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic-AE	mg/kg	11.1	1.18	10.7	23	10.9	0.84	0.31	10.6	-	11.6
Cadmium-AE	µg/kg	947	68.5	7.2	18	953	48.4	20.2	913	-	981
Chromium-AE	mg/kg	41.6	8.68	20.9	21	40.9	5.85	2.37	37.7	-	45.5
Cobalt-AE	mg/kg	5.79	0.309	5.3	12	5.81	0.214	0.112	5.60	-	5.99
Copper-AE	mg/kg	15.9	1.56	9.8	22	16.2	1.05	0.42	15.2	-	16.6
Iron-AE	%	1.87	0.113	6.0	18	1.87	0.075	0.033	1.81	-	1.92
Lead-AE	mg/kg	26.1	1.52	5.8	23	25.9	1.07	0.40	25.4	-	26.7
Lithium-AE	mg/kg	14.8	1.46	9.9	11	14.6	1.08	0.55	13.8	-	15.7
Manganese-AE	mg/kg	325	34.8	10.7	18	327	24.4	10.3	308	-	342
Mercury-AE	µg/kg	179	15.8	8.8	19	177	11.0	4.5	172	-	187
Nickel-AE	mg/kg	12.5	0.75	6.0	23	12.5	0.49	0.20	12.14	-	12.79
Zinc-AE	mg/kg	122	6.1	5.0	23	123	4.0	1.6	119.7	-	125.0

### Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
TOC	%	1.09	0.079	7.2	12	1.10	0.055	0.029	1.04	-	1.14



## Indicative Values MS1

### Method: Real totals - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Barium-RT	mg/kg	209	8.0	3.8	6	208	5.2	4.1	201	-	217
Calcium-RT	g/kg	41.2	1.37	3.3	5	41.5	1.09	0.77	39.6	-	42.7
Cobalt-RT	mg/kg	6.19	0.313	5.1	8	6.23	0.184	0.138	5.94	-	6.45
Lithium-RT	mg/kg	19.0	3.62	19.0	9	19.5	2.60	1.51	16.3	-	21.8
Magnesium-RT	mg/kg	4790	573	12.0	6	4640	380	293	4220	-	5370
Mercury-RT	µg/kg	186	15.7	8.4	9	190	11.4	6.5	174	-	198
Phosphorus-RT	mg/kg	760	21.7	2.9	4	764	14.6	13.5	730	-	790
Potassium-RT	mg/kg	12100	90	0.8	4	12100	70	60	11964	-	12220
Sodium-RT	mg/kg	6750	232	3.4	4	6760	148	145	6433	-	7077
Strontium-RT	mg/kg	190	9.1	4.8	5	186	6.4	5.1	179	-	200
Uranium-RT	mg/kg	2.03	0.376	18.5	4	2.03	0.245	0.235	1.51	-	2.56
Vanadium-RT	mg/kg	43.3	1.46	3.4	9	43.2	0.99	0.61	42.2	-	44.5

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

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium-AE	%	1.19	0.318	26.8	16	1.22	0.202	0.099	1.02	-	1.36
Barium-AE	mg/kg	39.6	15.65	39.6	10	38.7	11.40	6.19	28.5	-	50.6
Calcium-AE	g/kg	39.6	0.72	1.8	8	39.3	0.59	0.32	39.0	-	40.2
Magnesium-AE	mg/kg	4310	440	10.2	9	4220	319	183	3979	-	4642
Molybdenum-AE	mg/kg	0.602	0.0731	12.2	6	0.595	0.0470	0.0373	0.529	-	0.675
Phosphorus-AE	mg/kg	703	16.9	2.4	7	700	10.8	8.0	688	-	718
Potassium-AE	mg/kg	2960	293	9.9	5	3020	225	164	2624	-	3298
Sodium-AE	mg/kg	2440	133	5.4	4	2480	99	83	2255	-	2624
Strontium-AE	mg/kg	207	49.7	24.0	5	213	31.0	27.8	150	-	264
Thallium-AE	µg/kg	176	49.3	28.0	4	180	32.0	30.8	108	-	245
Uranium-AE	mg/kg	0.739	0.0954	12.9	5	0.755	0.0736	0.0533	0.629	-	0.849
Vanadium-AE	mg/kg	31.1	5.95	19.1	14	31.7	3.91	1.99	27.7	-	34.5

### Method: Carbon - MS1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Inorganic-Carbonate	%	1.27	0.231	18.1	7	1.29	0.170	0.109	1.07	-	1.48