



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 158



Certificate of Analysis AQ3 158

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.

Sample information

QUASIMEME reference materials cover a range of natural SeaWater species from contaminated waters from the North Sea and/or Mediterranean.

This AQ3 sample 158 of Seawater spiked with metals from North Sea (near Neeltje Jans) 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
2020.2	AQ3	QTM304SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	2.12	0.301	14.2	19	2.12	0.210	0.086	1.98	-	2.26
Cadmium	µg/l	0.123	0.0170	13.9	22	0.121	0.0105	0.0045	0.115	-	0.130
Chromium	µg/l	0.930	0.0991	10.7	17	0.953	0.0728	0.0300	0.879	-	0.980
Cobalt	µg/l	0.124	0.0211	17.0	14	0.126	0.0150	0.0070	0.112	-	0.136
Copper	µg/l	2.74	0.427	15.6	21	2.80	0.300	0.116	2.54	-	2.93
Lead	µg/l	0.225	0.0427	19.0	17	0.230	0.0300	0.0129	0.203	-	0.247
Manganese	µg/l	1.28	0.161	12.6	14	1.27	0.107	0.054	1.19	-	1.37
Nickel	µg/l	1.11	0.205	18.4	19	1.10	0.140	0.059	1.01	-	1.21
Vanadium	µg/l	2.16	0.339	15.7	16	2.17	0.236	0.106	1.98	-	2.34
Zinc	µg/l	7.40	1.363	18.4	20	7.66	0.960	0.381	6.76	-	8.03



Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Boron	µg/l	4290	456	10.6	9	4420	281	190	3949	-	4636
Iron	µg/l	1.84	0.373	20.3	9	1.96	0.248	0.155	1.56	-	2.12
Silver	µg/l	0.213	0.0291	13.7	9	0.221	0.0210	0.0121	0.191	-	0.235
Tin	µg/l	0.825	0.2132	25.8	7	0.840	0.1500	0.1007	0.635	-	1.02