



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 164



Certificate of Analysis AQ3 164

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 164 of Low sal. seawater spiked with high conc metals from North Sea (diluted) 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
2021.1	AQ3	QTM314SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	148	12.8	8.6	21	150	9.0	3.5	142	-	154
Cadmium	µg/l	36.4	2.73	7.5	21	36.7	1.85	0.75	35.2	-	37.6
Chromium	µg/l	118	10.0	8.5	21	120	7.0	2.7	113	-	122
Cobalt	µg/l	101	10.3	10.1	19	100	7.0	2.9	96.5	-	106
Copper	µg/l	300	26.0	8.7	20	304	17.7	7.3	288	-	312
Iron	µg/l	237	23.7	10.0	18	233	17.5	7.0	225	-	248
Lead	µg/l	84.1	5.66	6.7	20	83.8	3.81	1.58	81.5	-	86.8
Manganese	µg/l	197	16.5	8.4	19	197	11.0	4.7	189	-	205
Nickel	µg/l	146	11.6	8.0	21	144	7.9	3.2	141	-	151
Silver	µg/l	44.1	2.79	6.3	13	44.7	1.90	0.97	42.4	-	45.8
Vanadium	µg/l	159	15.2	9.6	20	160	10.6	4.3	151	-	166
Zinc	µg/l	556	59.8	10.8	20	555	41.3	16.7	528	-	584



Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Boron	µg/l	2350	185	7.9	9	2340	122	77	2214	-	2494
Tin	µg/l	70.9	3.79	5.3	9	70.5	2.70	1.58	68.0	-	73.7