



# QUASIMEME

Quality assurance of information  
for marine environmental monitoring

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## Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 174

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## Certificate of Analysis    AQ3 174

### 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 174 of Seawater spiked with metals from North Sea 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	AQ3	QTM336SW



## Consensus Values AQ3

### Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	2.96	0.428	14.4	17	3.00	0.297	0.130	2.74	-	3.18
Cadmium	µg/l	0.361	0.0138	3.8	19	0.360	0.0100	0.0040	0.354	-	0.368
Chromium	µg/l	0.854	0.0534	6.3	12	0.855	0.0350	0.0193	0.820	-	0.887
Cobalt	µg/l	1.09	0.062	5.7	12	1.10	0.040	0.022	1.05	-	1.12
Copper	µg/l	4.40	0.506	11.5	20	4.53	0.350	0.141	4.17	-	4.64
Lead	µg/l	2.31	0.217	9.4	21	2.30	0.160	0.059	2.21	-	2.41
Manganese	µg/l	8.48	0.539	6.4	14	8.53	0.385	0.180	8.17	-	8.79
Nickel	µg/l	2.74	0.407	14.9	18	2.77	0.275	0.120	2.53	-	2.94
Vanadium	µg/l	3.69	0.216	5.9	11	3.66	0.150	0.081	3.55	-	3.83
Zinc	µg/l	4.53	0.701	15.5	16	4.59	0.475	0.219	4.16	-	4.90



### Indicative Values AQ3

#### Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Boron	µg/l	4470	195	4.4	8	4490	128	86	4315	-	4633
Iron	µg/l	5.72	0.998	17.5	11	5.70	0.708	0.376	5.05	-	6.38
Magnesium	mg/l	1190	81	6.8	8	1190	56	36	1121	-	1254
Silver	µg/l	0.601	0.0778	12.9	6	0.600	0.0550	0.0397	0.523	-	0.679
Strontium	mg/l	7.03	0.300	4.3	8	7.03	0.218	0.133	6.79	-	7.28
Uranium	µg/l	2.55	0.820	32.2	4	2.57	0.522	0.513	1.41	-	3.69