QUASIMEME

**Quality assurance of information
for marine environmental monitoring**

Certificate of Analysis

Metals in seawater

REFERENCE MATERIAL

AQ3 sample 178

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 % probabilty) 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 178 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
2023.1	AQ3	QTM344SW

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Copper	µg/l	4.72	0.542	11.5	17	4.77	0.370	0.164	4.44	-	4.99
Cadmium	µg/l	0.201	0.0250	12.4	14	0.205	0.0140	0.0083	0.186	-	0.215
Lead	µg/l	0.905	0.1489	16.4	15	0.935	0.0850	0.0480	0.823	-	0.987
Cobalt	µg/l	0.651	0.0765	11.8	10	0.655	0.0300	0.0303	0.597	-	0.705
Manganese	µg/l	2.08	0.335	16.1	11	2.04	0.210	0.126	1.86	-	2.30
Arsenic	µg/l	3.35	0.410	12.2	12	3.44	0.260	0.148	3.09	-	3.61
Nickel	µg/l	4.03	0.568	14.1	16	3.97	0.460	0.177	3.73	-	4.33
Zinc	µg/l	5.95	0.894	15.0	14	6.06	0.505	0.299	5.43	-	6.46
Vanadium	µg/l	5.45	0.169	3.1	10	5.46	0.140	0.067	5.33	-	5.57

Indicative Values   AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Iron	µg/l	1.90	0.439	23.1	6	1.92	0.382	0.224	1.46	-	2.34
Chromium	µg/l	0.914	0.4930	54.0	8	1.100	0.2590	0.2179	0.512	-	1.32
Silver	µg/l	-	-	-	4	1.00	0.8	-	-	-	-
Boron	µg/l	4361	368.5	8.5	8	4407	166.5	162.9	4061	-	4661
Magnesium	mg/l	1205	43.8	3.6	6	1214	18.5	22.3	1162	-	1249
Strontium	mg/l	7.11	0.254	3.6	6	7.13	0.146	0.129	6.85	-	7.36