



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 173



Certificate of Analysis AQ3 173

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 173 of Seawater unspiked 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	QTM335SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	2.62	0.187	7.1	16	2.58	0.120	0.058	2.52	-	2.72
Copper	µg/l	6.53	0.854	13.1	21	6.76	0.600	0.233	6.14	-	6.92
Manganese	µg/l	5.21	0.361	6.9	14	5.24	0.235	0.121	5.01	-	5.42
Nickel	µg/l	0.478	0.0636	13.3	13	0.495	0.0450	0.0220	0.440	-	0.516
Vanadium	µg/l	1.63	0.187	11.4	11	1.65	0.144	0.070	1.51	-	1.75



Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Boron	µg/l	4400	235	5.4	8	4400	159	104	4204	-	4587
Cadmium	µg/l	0.0161	0.0097	60.0	9	0.0170	0.0070	0.0040	0.0088	-	0.0234
Chromium	µg/l	0.162	0.0616	37.9	7	0.180	0.0409	0.0291	0.107	-	0.218
Cobalt	µg/l	0.0662	0.0066	10.0	7	0.0650	0.0050	0.0031	0.0603	-	0.0721
Iron	µg/l	4.16	1.490	35.8	11	4.17	1.120	0.561	3.17	-	5.15
Lead	µg/l	0.0836	0.0212	25.4	15	0.0890	0.0160	0.0068	0.0719	-	0.0953
Magnesium	mg/l	1190	74	6.2	8	1190	52	33	1128	-	1249
Strontium	mg/l	7.05	0.551	7.8	8	7.00	0.390	0.243	6.60	-	7.50
Uranium	µg/l	2.54	0.778	30.6	4	2.56	0.492	0.486	1.46	-	3.62
Zinc	µg/l	2.19	0.857	39.2	13	2.50	0.600	0.297	1.67	-	2.70