



# QUASIMEME

Quality assurance of information  
for marine environmental monitoring

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## Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 157

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## Certificate of Analysis    AQ3 157

### 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 157 of Seawater unspiked 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	QTM303SW



### Consensus Values AQ3

#### Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	1.77	0.342	19.3	19	1.80	0.229	0.098	1.61	-	1.94
Copper	µg/l	2.71	0.413	15.3	21	2.70	0.300	0.113	2.52	-	2.89
Manganese	µg/l	1.10	0.049	4.5	14	1.11	0.038	0.016	1.07	-	1.12
Nickel	µg/l	0.413	0.0324	7.8	14	0.422	0.0240	0.0108	0.395	-	0.432
Zinc	µg/l	8.77	1.173	13.4	19	8.80	0.804	0.337	8.21	-	9.34



### Indicative Values AQ3

#### Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Boron	µg/l	4270	558	13.1	9	4370	374	232	3848	-	4689
Cadmium	µg/l	0.0230	0.0101	44.1	11	0.0220	0.0070	0.0038	0.0162	-	0.0297
Chromium	µg/l	0.193	0.1534	79.4	12	0.210	0.1035	0.0554	0.0967	-	0.290
Cobalt	µg/l	0.0210	0.0088	42.0	8	0.0220	0.0059	0.0039	0.0138	-	0.0282
Iron	µg/l	0.942	0.2271	24.1	8	1.012	0.1665	0.1004	0.757	-	1.13
Lead	µg/l	0.0290	0.0040	13.8	9	0.0300	0.0030	0.0017	0.0260	-	0.0320
Silver	µg/l	0.0089	0.0025	28.3	6	0.0095	0.0019	0.0013	0.0064	-	0.0115
Tin	µg/l	0.358	0.0955	26.7	7	0.390	0.0800	0.0451	0.272	-	0.443
Vanadium	µg/l	1.65	0.466	28.3	16	1.66	0.336	0.146	1.40	-	1.90