



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 160



Certificate of Analysis AQ3 160

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 160 of Seawater (diluted) spiked with high conc. Metals 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	QTM306SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	511	34.2	6.7	19	518	23.7	9.8	494	-	527
Cadmium	µg/l	26.9	1.59	5.9	19	27.1	1.10	0.46	26.1	-	27.7
Chromium	µg/l	165	7.7	4.6	18	166	5.5	2.3	161.0	-	168.6
Cobalt	µg/l	234	22.1	9.4	14	235	15.2	7.4	221	-	247
Copper	µg/l	268	27.8	10.4	17	271	17.8	8.4	254	-	282
Iron	µg/l	403	36.9	9.1	13	400	27.0	12.8	381	-	425
Lead	µg/l	48.1	2.59	5.4	19	48.3	1.49	0.74	46.8	-	49.3
Manganese	µg/l	322	27.0	8.4	14	318	18.4	9.0	307	-	338
Nickel	µg/l	71.0	7.28	10.2	17	71.8	5.03	2.21	67.3	-	74.8
Silver	µg/l	42.1	3.55	8.4	11	41.6	2.40	1.34	39.7	-	44.5
Tin	µg/l	240	29.6	12.3	10	236	20.0	11.7	219	-	261
Vanadium	µg/l	335	33.5	10.0	14	327	23.7	11.2	315	-	354
Zinc	µg/l	638	52.9	8.3	17	644	34.9	16.0	611	-	665



Indicative Values AQ3

Method: Metals - AQ3

Element

Boron

Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
µg/l	1540	163	10.6	8	1570	107	72	1406	-	1672