



# QUASIMEME

Quality assurance of information  
for marine environmental monitoring

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## Certificate of Analysis



Biota

REFERENCE MATERIAL

Biota sample 356

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## Certificate of Analysis Biota 356

### 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.

The results of each determinand is expressed on a wet weight basis.

### Sample information

QUASIMEME reference materials cover a range of natural Biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied wet test materials are homogenised and sterilised by autoclaving.

This Biota sample 356 of De-headed dab and sole from Western Scheldt, Netherlands 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	BT1	QTM138BT
2020.1	BT1	QTM126BT
2019.1	BT2	QOR139BT
2019.1	BT9	QBC059BT
2018.2	BT1	QTM121BT



## Consensus Values BT1

### Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	mg/kg	5.74	0.579	10.1	71	5.72	0.404	0.086	5.60	-	5.87
Barium	µg/kg	191	23.4	12.3	13	190	16.0	8.1	177	-	205
Cadmium	µg/kg	13.0	1.43	11.0	67	13.0	1.00	0.22	12.69	-	13.38
Calcium	mg/kg	3600	186	5.2	13	3630	120	64	3484	-	3707
Chromium	µg/kg	214	28.8	13.5	62	217	20.3	4.6	207	-	221
Cobalt	µg/kg	19.7	2.20	11.1	35	19.8	1.50	0.46	19.0	-	20.5
Copper	µg/kg	1040	88	8.4	73	1040	62	13	1021	-	1062
Iron	mg/kg	33.1	3.90	11.8	47	33.6	2.80	0.71	32.0	-	34.3
Lead	µg/kg	40.7	5.44	13.4	59	41.0	3.90	0.88	39.3	-	42.1
Magnesium	mg/kg	372	24.0	6.4	17	374	16.4	7.3	360	-	384
Manganese	µg/kg	1850	160	8.6	52	1880	105	28	1803	-	1892
Mercury	µg/kg	60.4	5.16	8.6	88	60.0	3.49	0.69	59.3	-	61.5
Molybdene	µg/kg	14.1	1.14	8.1	25	14.4	0.80	0.28	13.6	-	14.6
Nickel	µg/kg	162	40.3	24.8	62	164	28.3	6.4	152	-	172
Potassium	mg/kg	3240	82	2.5	14	3270	64	27	3196	-	3290
Selenium	µg/kg	874	79.3	9.1	54	880	52.6	13.5	853	-	896
Silver	µg/kg	5.96	0.529	8.9	27	6.00	0.400	0.127	5.75	-	6.17
Sodium	mg/kg	1540	56	3.6	15	1530	37	18	1511	-	1573
Tin	µg/kg	91.4	10.25	11.2	15	94.0	6.90	3.31	85.7	-	97.0
Uranium	µg/kg	1.97	0.279	14.2	17	2.00	0.200	0.085	1.82	-	2.11
Vanadium	µg/kg	75.1	11.53	15.3	30	76.1	8.01	2.63	70.9	-	79.4
Zinc	mg/kg	16.1	1.73	10.7	72	16.2	1.18	0.25	15.7	-	16.5

### Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Dry-weight	%	23.0	0.29	1.3	58	23.0	0.21	0.05	22.87	-	23.03



## Indicative Values BT1

### Method: Metals - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Aluminium	mg/kg	14.3	3.96	27.7	27	13.9	2.79	0.95	12.7	-	15.9
Antimony	µg/kg	3.08	0.837	27.2	16	3.07	0.553	0.261	2.64	-	3.52
Cesium	µg/kg	22.7	0.83	3.7	4	22.7	0.60	0.52	21.5	-	23.8
Lithium	µg/kg	60.0	7.69	12.8	8	60.1	5.16	3.40	53.7	-	66.3
Phosphorus	mg/kg	3630	818	22.5	12	3680	561	295	3120	-	4140
Rubidium	µg/kg	897	37.4	4.2	5	900	23.0	20.9	854	-	940
Strontium	µg/kg	16100	630	3.9	6	15900	450	320	15420	-	16690
Sulfur	mg/kg	2530	111	4.4	4	2530	73	70	2378	-	2687
Thallium	µg/kg	0.582	0.1282	22.0	8	0.615	0.0941	0.0567	0.477	-	0.687
Titanium	µg/kg	551	231.0	41.9	8	502	163.4	102.1	363	-	739

### Method: Weight - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Ash-Weight	%	2.23	0.093	4.2	5	2.20	0.060	0.052	2.12	-	2.34

### Method: Lipids - BT1

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	3.59	0.472	13.1	8	3.58	0.302	0.209	3.21	-	3.98



## Consensus Values BT2

Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
PCB28	µg/kg	1.83	0.208	11.4	21	1.84	0.140	0.057	1.73	-	1.92
PCB101	µg/kg	6.11	0.788	12.9	21	6.23	0.523	0.215	5.76	-	6.47
PCB118	µg/kg	4.25	0.678	16.0	19	4.26	0.430	0.195	3.93	-	4.58
PCB138	µg/kg	8.31	1.351	16.2	18	8.53	0.957	0.398	7.64	-	8.98
PCB153	µg/kg	17.7	3.88	21.9	20	18.0	2.79	1.08	15.9	-	19.5
PCB156	µg/kg	0.897	0.1501	16.7	15	0.889	0.1000	0.0484	0.814	-	0.979
pp'-DDD	µg/kg	0.649	0.1061	16.4	14	0.675	0.0715	0.0354	0.588	-	0.710
pp'-DDE	µg/kg	2.87	0.572	19.9	17	2.96	0.400	0.174	2.58	-	3.17



## Indicative Values BT2

### Method: Chlorinated organics - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
PCB31	µg/kg	1.01	0.165	16.3	8	0.972	0.112	0.073	0.877	- 1.15
PCB52	µg/kg	2.65	0.665	25.1	20	2.63	0.455	0.186	2.34	- 2.96
PCB105	µg/kg	0.761	0.1895	24.9	14	0.803	0.1325	0.0633	0.652	- 0.870
PCB138+PCB163	µg/kg	11.5	1.76	15.3	4	11.4	1.10	1.10	9.03	- 13.9
PCB180	µg/kg	7.17	1.663	23.2	21	7.47	1.179	0.454	6.42	- 7.93
HCB	µg/kg	0.125	0.0284	22.7	14	0.130	0.0200	0.0095	0.109	- 0.141
Dieldrin	µg/kg	0.845	0.3514	41.6	6	0.868	0.2450	0.1793	0.494	- 1.20
Transnonachlor	µg/kg	0.0497	0.0117	23.6	4	0.0542	0.0090	0.0073	0.0334	- 0.0659

### Method: Lipids - BT2

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits	
Total-Lipid	%	3.30	0.355	10.7	8	3.32	0.225	0.157	3.01	- 3.59
Extractable-Lipid	%	3.31	0.460	13.9	4	3.29	0.300	0.288	2.67	- 3.95



### Consensus Values BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE47	µg/kg	0.284	0.0443	15.6	11	0.284	0.0300	0.0167	0.255 - 0.314



## Indicative Values BT9

### Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits
BDE28	µg/kg	0.0172	0.0043	24.7	9	0.0171	0.0029	0.0018	0.0140 - 0.0204
BDE99	µg/kg	0.0188	0.0065	34.3	8	0.0195	0.0046	0.0029	0.0136 - 0.0241
BDE100	µg/kg	0.0797	0.0128	16.1	10	0.0810	0.0095	0.0051	0.0707 - 0.0888
BDE153	µg/kg	0.0194	0.0028	14.3	6	0.0201	0.0020	0.0014	0.0166 - 0.0222
BDE154	µg/kg	0.0389	0.0120	30.9	9	0.0397	0.0083	0.0050	0.0298 - 0.0479