



**WAGENINGEN EVALUATING PROGRAMS  
FOR ANALYTICAL LABORATORIES**

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**Certificate of Analysis**



**International Sediment Exchange for Tests on Organic Contaminants**

**REFERENCE MATERIAL**

**SETOC sample 715**



## Certificate of Analysis SETOC 715

### 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 8 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into three sections: Consensus Values, Indicative Values and Values for Information. The division is made on the reliability of the data. Consensus Values are based on at least 16 results while the coefficient of variation is smaller than 25 %. Indicative Values are based on at least 8 and less than 16 results or a coefficient of variation between 25 % and 50 %. Other values, based on more than 2 and less than 8 results or a coefficient of variation higher than 50 %, are given for information only.

In the sections with Consensus Values and Indicative Values the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median and MAD (Median of Absolute Deviation) and the uncertainty in the consensus values. The confidence limits (at 95 % probability) are calculated for these determinands.

In the section with Information Values the following parameters are given: median, MAD and number of results. For determinands which have at least 5 results reported as smaller than (<) the median of these 'smaller than results' is calculated. In some cases this median of '<' values is much smaller than median and mean of the indicative values. This may be caused by a too optimistic (too low) value for the detection limit reported by a (small) majority of participating laboratories who report '<' -values.

All values, expressed on a weight basis (kg or %), are reported in oven dry (105 °C) material. Moisture is reported in the material as received.

### Sample information

WEPAL reference materials are from natural sources only. There is no spiking, mixing or other alterations of the samples. For sample preparation the SETOC samples are dried at 40 °C and milled to pass a 0.5 mm sieve.

This SETOC sample 715 of Marine Sediment from Netherlands is prepared for the WEPAL proficiency programs. The sample is used in 6 periods (or rounds). Only results from the last 5 periods are used. In this way the consensus values will reflect the latest 'state of the art' in the analytical techniques used in the laboratories. The results on which the values in this report are based were taken from the periods given in the following table.

Year	Round	Number
2009	2	4
2000	2	2
1998	2	2
1997	2	3
1996	2	2



### Consensus Values SETOC 715

Method: Metals  
Element  
Pb

Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
mg/kg	3.49	0.724	20.8	89	3.50	0.500	0.096	3.34	-	3.64



## Indicative Values SETOC 715

### Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
AOX	mg/kg	12.5	4.76	38.1	24	12.4	3.25	1.21	10.5	-	14.5
Particles > 63 µm	%	98.6	0.66	0.7	10	98.5	0.45	0.26	98.2	-	99.1

### Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
As	mg/kg	1.34	0.340	25.3	78	1.36	0.235	0.048	1.27	-	1.42
Cr	mg/kg	13.1	4.03	30.7	145	13.0	2.80	0.42	12.5	-	13.8
Ni	mg/kg	1.32	0.511	38.8	80	1.39	0.370	0.071	1.20	-	1.43
Zn	mg/kg	5.02	1.501	29.9	107	5.28	1.080	0.181	4.73	-	5.30



## Informative Values SETOC 715



### Method: Polycyclic aromatic hydrocarbons

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
acenaphthene	µg/kg	1.000	0.9400	22	20.000	219
acenaphthylene	µg/kg	0.980	0.9550	16	30.000	203
anthracene	µg/kg	1.571	1.4811	28	10.000	248
benz(a)anthracene	µg/kg	1.80	1.540	35	10.00	242
benzo(a)pyrene	µg/kg	1.190	0.9400	33	10.000	247
benzo(b)fluoranthene	µg/kg	2.50	1.730	32	10.00	217
benzo(ghi)perylene	µg/kg	4.99	4.250	32	10.00	244
benzo(k)fluoranthene	µg/kg	1.90	1.610	29	10.00	240
chrysene	µg/kg	1.54	1.141	33	10.00	243
dibenz(ah)anthracene	µg/kg	1.000	0.8400	21	10.000	228
fluoranthene	µg/kg	5.85	4.835	52	10.00	230
fluorene	µg/kg	1.600	1.2500	35	10.000	210
indeno(1,2,3-cd)pyrene	µg/kg	10.00	8.450	34	10.00	241
naphthalene	µg/kg	6.60	5.700	45	20.00	220
phenanthrene	µg/kg	10.00	8.510	59	10.00	221
pyrene	µg/kg	2.50	1.500	39	10.00	219

### Method: Polychlorobiphenyls

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
PCB 028	µg/kg	0.520	0.4250	14	1.000	165
PCB 031	µg/kg	-	-	0	2.00	20
PCB 052	µg/kg	1.28	1.125	18	1.00	169
PCB 081	µg/kg	-	-	0	1.00	5
PCB 101	µg/kg	0.820	0.6200	19	1.000	168
PCB 105	µg/kg	0.140	0.0850	3	1.500	26
PCB 118	µg/kg	0.755	0.6400	14	1.000	146
PCB 128	µg/kg	-	-	0	2.00	27
PCB 138	µg/kg	1.000	0.7000	25	1.000	162
PCB 149	µg/kg	-	-	0	2.00	22
PCB 153	µg/kg	0.895	0.7300	28	1.000	158
PCB 180	µg/kg	0.700	0.5600	26	1.000	162

### Method: Organochlorine pesticides

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N



### Informative Values SETOC 715

1,2,3 trichlorobenzene	µg/kg	14.6	0.03	3	3.00	22
1,2,3,4 tetrachlorobenzene	µg/kg	26.9	24.44	3	2.50	24
aldrin	µg/kg	-	-	0	1.00	111

#### Method: Organochlorine pesticides

Element	Unit	Median	MAD	N	Results smaller than (<) Median of <	N
alpha-endosulfan	µg/kg	-	-	0	1.00	96
beta-HCH	µg/kg	-	-	0	1.00	115
dieldrin	µg/kg	3.50	2.930	3	1.00	111
endrin	µg/kg	-	-	0	1.00	110
gamma-HCH	µg/kg	0.0400	0.0100	3	1.0000	115
hexachlorobenzene	µg/kg	8.00	5.500	6	1.00	114
hexachlorobutadiene	µg/kg	-	-	0	1.00	52
o,p`-DDD	µg/kg	-	-	0	1.00	98
p,p`-DDE	µg/kg	-	-	0	1.00	114
p,p`-DDT	µg/kg	59.0	-	3	1.60	114
pentachlorobenzene	µg/kg	1.39	0.060	3	1.00	67

(cont.)

#### Method: Other parameters

Element	Unit	Median	MAD	N	Results smaller than (<) Median of <	N
CN - Free	mg/kg	1.50	0.100	3	1.00	38
CN - Total	mg/kg	0.170	0.1200	5	1.000	69
EOX	mg/kg	0.240	0.1350	26	0.100	92
Inorganic carbon	g/kg	0.300	0.1450	8	1.000	12
Organic carbon	g/kg	0.675	0.2950	24	1.000	16
Mineral oil, GC	mg/kg	19.4	17.60	27	20.0	67
Mineral oil, IR	mg/kg	36.0	17.50	14	10.0	49
Particles < 2 µm	%	0.970	0.6300	28	1.000	16
Particles < 63 µm	%	1.100	0.6000	17		

#### Method: Metals

Element	Unit	Median	MAD	N	Results smaller than (<) Median of <	N
Ba	mg/kg	-	-	0	10.0	7
Cd	mg/kg	0.1000	0.0900	23	0.2000	135
Co	mg/kg	-	-	0	2.00	5
Cu	mg/kg	0.955	0.3350	74	5.000	87
Hg	mg/kg	0.0300	0.0200	22	0.0600	122



**Informative Values SETOC 715**



Mo	mg/kg	-	-	0	1.00	7
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