



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 783



Certificate of Analysis SETOC 783

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, the 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 8 results and a maximum relative uncertainty of 6.25%. Indicative Values are based on a maximum relative uncertainty of 35% and a minimum of 4 and maximum of 7 results, or a relative uncertainty greater than 6.25% when there are at least 8 results.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation), the uncertainty of the mean (consensus or indicative) value and the relative uncertainty.

All values, expressed on a weight basis (kg or %), are reported as oven-dried (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 783 of Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 8 periods (or rounds). Only results from the last 5 periods are used. This way, the consensus values reflect the latest 'state of the art' analytical techniques used by 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
2025	1	1
2024	2	4
2023	3	1
2020	3	4
2017	4	3



Consensus Values SETOC 783

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	51.4	24.0	46.7	103	54.3	15.0	2.96	5.75
acenaphthylene	µg/kg	39.1	14.4	36.8	92	40.2	9.93	1.88	4.80
acenaphthene	µg/kg	31.1	9.87	31.7	94	31.8	6.59	1.27	4.09
fluorene	µg/kg	55.1	17.2	31.2	99	58.2	12.0	2.16	3.92
phenanthrene	µg/kg	411	87.0	21.1	131	412	54.9	9.50	2.31
anthracene	µg/kg	70.5	22.8	32.4	119	71.9	16.1	2.61	3.71
fluoranthene	µg/kg	966	174	18.1	132	961	122	19.0	1.97
pyrene	µg/kg	792	157	19.8	112	803	114	18.5	2.34
chrysene	µg/kg	558	151	27.1	132	550	100	16.4	2.95
benz(a)anthracene	µg/kg	373	91.2	24.4	132	373	57.0	9.93	2.66
benzo(b)fluoranthene	µg/kg	682	189	27.7	104	703	115	23.1	3.39
benzo(k)fluoranthene	µg/kg	278	63.8	22.9	128	281	43.2	7.04	2.53
benzo(a)pyrene	µg/kg	259	60.4	23.3	131	259	40.3	6.59	2.55
dibenz(ah)anthracene	µg/kg	97.0	25.1	25.9	105	97.7	16.2	3.06	3.16
indeno(1,2,3-cd)pyrene	µg/kg	374	89.5	23.9	129	380	58.4	9.85	2.64
benzo(ghi)perylene	µg/kg	383	75.1	19.6	132	380	40.8	8.17	2.13
EPA ΣPAH(16)	µg/kg	5518	1206	21.8	81	5590	779	167	3.03

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	78.5	18.8	24.0	120	81.9	11.9	2.15	2.74
PCB 052	µg/kg	60.0	11.9	19.8	121	60.6	8.39	1.35	2.25
PCB 101	µg/kg	74.2	13.8	18.6	123	74.0	8.80	1.55	2.09
PCB 105	µg/kg	14.8	2.53	17.1	24	14.7	1.46	0.646	4.36
PCB 118	µg/kg	45.2	7.53	16.7	116	45.3	4.91	0.874	1.93
PCB 138	µg/kg	92.0	22.8	24.8	122	92.0	14.4	2.58	2.80
PCB 149	µg/kg	73.9	13.5	18.2	15	74.0	8.50	4.35	5.88
PCB 153	µg/kg	99.1	16.5	16.7	122	98.2	9.61	1.87	1.89
PCB 156	µg/kg	9.63	1.85	19.2	23	9.50	0.850	0.482	5.01
PCB 180	µg/kg	66.5	11.5	17.4	120	66.3	7.20	1.32	1.98
ΣPCB(7)	µg/kg	524	66.6	12.7	60	525	39.2	10.8	2.05

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
trans-chlordane	µg/kg	0.860	0.087	10.1	9	0.871	0.038	0.036	4.21



Consensus Values SETOC 783

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	2801	536	19.1	104	2820	366	65.7	2.35
Organic carbon	g/kg	39.6	3.82	9.7	68	39.9	2.32	0.579	1.46
CN - Total	mg/kg	3.15	0.516	16.4	38	3.20	0.344	0.105	3.32
CN - Free	mg/kg	0.559	0.055	9.9	12	0.567	0.021	0.020	3.56

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	14.8	1.54	10.4	57	14.9	1.01	0.255	1.72
Cd	mg/kg	8.54	0.649	7.6	58	8.50	0.378	0.107	1.25
Cr	mg/kg	74.2	12.5	16.9	59	74.0	7.37	2.04	2.75
Cu	mg/kg	125	12.8	10.2	59	124	8.70	2.08	1.67
Hg	mg/kg	0.815	0.081	9.9	55	0.809	0.049	0.014	1.68
Ni	mg/kg	39.3	3.84	9.8	61	40.0	2.39	0.615	1.56
Pb	mg/kg	226	21.2	9.4	58	225	13.2	3.48	1.54
Zn	mg/kg	1334	107	8.0	59	1323	60.3	17.4	1.30
Ba	mg/kg	231	26.3	11.4	39	230	16.7	5.27	2.28
Co	mg/kg	11.4	1.12	9.8	44	11.4	0.625	0.210	1.84
Mo	mg/kg	1.25	0.225	18.1	36	1.26	0.124	0.047	3.77

Indicative Values SETOC 783

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 031	µg/kg	64.2	20.4	31.7	10	64.8	12.0	8.05	12.5
PCB 128	µg/kg	15.1	3.73	24.8	20	14.1	2.08	1.04	6.93
PCB 077	µg/kg	2.88	1.96	68.1	15	4.10	1.40	0.633	22.0
PCB 081	µg/kg	0.664	1.23	185.1	8	1.50	1.42	0.543	81.8
PCB 114	µg/kg	0.684	0.370	54.0	9	1.21	0.190	0.154	22.5
PCB 123	µg/kg	0.532	0.411	77.2	8	4.63	0.565	0.182	34.1
PCB 126	µg/kg	1.06	1.96	185.5	8	1.46	1.35	0.867	82.0
PCB 157	µg/kg	1.45	0.589	40.7	13	1.60	0.430	0.204	14.1
PCB 167	µg/kg	4.35	1.01	23.2	16	4.40	0.610	0.316	7.26
PCB 189	µg/kg	1.48	0.392	26.6	15	1.56	0.260	0.127	8.57

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobenzene	µg/kg	0.507	0.100	19.8	11	0.527	0.049	0.038	7.47
pentachlorobenzene	µg/kg	0.501	0.312	62.3	8	0.547	0.194	0.138	27.5
1,2,3 trichlorobenzene	µg/kg	0.487	0.275	56.4	5	0.517	0.167	0.154	31.6
1,2,3,4 tetrachlorobenzene	µg/kg	0.584	0.320	54.8	4	0.624	0.161	0.200	34.2
1,2,4 trichlorobenzene	µg/kg	7.33	1.87	25.5	16	7.72	1.28	0.584	7.96
1,3,5 trichlorobenzene	µg/kg	0.861	0.208	24.2	12	0.860	0.112	0.075	8.72
gamma-HCH	µg/kg	0.191	0.049	25.5	5	0.214	0.028	0.027	14.2
cis-chlordane	µg/kg	0.592	0.030	5.1	4	0.600	0.016	0.019	3.16
p,p'-DDT	µg/kg	0.816	0.872	106.9	10	1.07	0.498	0.345	42.2
p,p'-DDE	µg/kg	6.89	2.28	33.1	26	7.16	1.56	0.559	8.12
o,p'-DDE	µg/kg	0.537	0.179	33.4	10	0.597	0.121	0.071	13.2
p,p'-DDD	µg/kg	1.65	0.761	46.2	18	1.90	0.336	0.224	13.6
o,p'-DDD	µg/kg	0.867	0.610	70.4	13	1.49	0.541	0.212	24.4

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
EOX	mg/kg	3.18	1.64	51.4	17	3.66	1.00	0.496	15.6
Inorganic carbon	g/kg	6.17	4.20	68.1	10	6.80	3.09	1.66	26.9
Particles < 2 µm	%	17.1	16.6	97.0	10	17.8	10.3	6.57	38.3
Particles < 63 µm	%	73.2	21.0	28.7	15	71.1	12.5	6.77	9.25
Particles > 63 µm	%	10.2	15.4	150.9	11	13.0	9.95	5.79	56.9
Particles < 50 µm	%	67.2	0.475	0.7	4	67.2	0.250	0.297	0.442



Indicative Values SETOC 783

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Sb	mg/kg	1.68	0.301	17.9	7	1.60	0.180	0.142	8.48
Sn	mg/kg	18.4	2.15	11.7	6	18.2	1.15	1.10	5.97
V	mg/kg	62.6	14.7	23.5	6	60.0	7.15	7.51	12.0

Method: Dibenzo-P Dioxin

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
1,2,3,7,8 Cl5DD	ng/kg	1.99	0.522	26.2	7	2.00	0.200	0.247	12.4
1,2,3,7,8,9 Cl6DD	ng/kg	6.99	4.76	68.1	8	6.90	2.50	2.10	30.1
1,2,3,6,7,8 Cl6DD	ng/kg	11.0	6.60	59.9	8	12.1	4.25	2.92	26.5
1,2,3,4,6,7,8 Cl7DD	ng/kg	133	51.4	38.7	8	139	26.8	22.7	17.1
Cl8DD	ng/kg	1136	502	44.2	8	1100	359	222	19.5

Method: Dibenzofuran

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
2,3,7,8 Cl4DF	ng/kg	15.2	4.47	29.5	8	14.7	3.70	1.98	13.0
2,3,4,7,8 Cl5DF	ng/kg	8.59	2.42	28.2	8	8.85	1.03	1.07	12.5
1,2,3,7,8 Cl5DF	ng/kg	6.11	3.26	53.3	8	6.73	1.47	1.44	23.6
1,2,3,4,7,8 Cl6DF	ng/kg	12.3	2.30	18.7	8	12.2	1.55	1.01	8.27
1,2,3,6,7,8 Cl6DF	ng/kg	6.07	2.22	36.6	7	6.30	1.20	1.05	17.3
2,3,4,6,7,8 Cl6DF	ng/kg	6.87	2.31	33.6	8	6.43	1.39	1.02	14.8
1,2,3,4,6,7,8 Cl7DF	ng/kg	54.0	21.4	39.6	8	50.5	16.2	9.45	17.5
1,2,3,4,7,8,9 Cl7DF	ng/kg	6.27	3.42	54.6	7	5.90	2.10	1.62	25.8
Cl8DF	ng/kg	162	64.4	39.7	8	150	49.0	28.4	17.5

Method: Experimental

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Tributyl Tin (TBT)	µg/kg	34.6	15.9	45.9	10	36.3	6.83	6.27	18.1