



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 694



Certificate of Analysis SETOC 694

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 694 of Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 2 periods (or rounds). 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	2	4
2021	3	3



Consensus Values SETOC 694

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
acenaphthene	µg/kg	136	27.3	20.1	42	137	19.5	5.27	3.87
fluorene	µg/kg	163	39.1	23.9	43	166	27.0	7.45	4.56
phenanthrene	µg/kg	1471	273	18.6	50	1479	185	48.3	3.28
anthracene	µg/kg	289	56.5	19.5	50	294	41.3	9.98	3.45
fluoranthene	µg/kg	3264	546	16.7	50	3285	346	96.5	2.96
pyrene	µg/kg	2453	404	16.5	42	2490	280	77.8	3.17
chrysene	µg/kg	1774	312	17.6	50	1797	214	55.2	3.11
benz(a)anthracene	µg/kg	1622	298	18.3	50	1636	184	52.6	3.24
benzo(b)fluoranthene	µg/kg	2179	647	29.7	39	2146	464	130	5.94
benzo(k)fluoranthene	µg/kg	936	190	20.3	49	948	110	33.9	3.62
benzo(a)pyrene	µg/kg	1430	223	15.6	50	1439	159	39.4	2.76
dibenz(ah)anthracene	µg/kg	320	91.3	28.5	41	323	53.0	17.8	5.57
indeno(1,2,3-cd)pyrene	µg/kg	1268	245	19.3	48	1286	173	44.2	3.48
benzo(ghi)perylene	µg/kg	1263	221	17.5	50	1266	130	39.0	3.09
EPA ΣPAH(16)	µg/kg	19602	3239	16.5	30	19755	2058	739	3.77

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 052	µg/kg	9.06	1.98	21.8	41	9.00	1.14	0.386	4.26
PCB 101	µg/kg	23.6	3.14	13.3	42	24.1	1.79	0.606	2.57
PCB 118	µg/kg	24.5	2.71	11.1	39	24.5	1.43	0.543	2.22
PCB 138	µg/kg	32.8	7.35	22.4	42	34.1	4.33	1.42	4.32
PCB 153	µg/kg	36.3	6.00	16.5	42	37.1	3.65	1.16	3.19
PCB 180	µg/kg	18.5	2.82	15.3	41	18.8	1.77	0.551	2.98
ΣPCB(7)	µg/kg	156	13.2	8.5	21	155	7.40	3.61	2.32

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
p,p'-DDE	µg/kg	24.7	4.17	16.9	14	25.2	2.59	1.39	5.64

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	456	102	22.4	40	456	59.1	20.2	4.43
Organic carbon	g/kg	33.7	5.58	16.6	25	33.9	3.34	1.40	4.14
CN - Total	mg/kg	1.62	0.203	12.5	11	1.65	0.109	0.076	4.71



Consensus Values SETOC 694

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	15.4	1.52	9.9	18	15.4	0.798	0.447	2.91
Cd	mg/kg	6.04	0.513	8.5	18	6.08	0.324	0.151	2.50
Cr	mg/kg	172	10.8	6.3	17	171	7.90	3.29	1.91
Cu	mg/kg	58.7	5.80	9.9	18	58.2	3.16	1.71	2.91
Hg	mg/kg	0.771	0.136	17.7	20	0.796	0.081	0.038	4.94
Ni	mg/kg	32.8	2.65	8.1	18	32.6	1.55	0.780	2.38
Pb	mg/kg	164	16.0	9.8	17	165	10.3	4.86	2.97
Zn	mg/kg	656	57.8	8.8	17	660	39.0	17.5	2.67
Ba	mg/kg	180	19.5	10.8	13	183	10.5	6.77	3.75
Co	mg/kg	14.2	2.18	15.4	16	14.0	1.35	0.682	4.80

Indicative Values SETOC 694

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	314	140	44.5	47	310	90.0	25.5	8.12
acenaphthylene	µg/kg	100	37.0	37.0	40	99.4	22.9	7.31	7.31

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	6.25	2.38	38.1	36	6.18	1.48	0.496	7.94
PCB 031	µg/kg	3.92	0.478	12.2	4	4.03	0.250	0.299	7.63
PCB 105	µg/kg	6.47	0.306	4.7	5	6.60	0.300	0.171	2.64
PCB 128	µg/kg	4.89	0.324	6.6	5	4.90	0.200	0.181	3.71
PCB 149	µg/kg	25.1	2.90	11.5	5	25.0	1.50	1.62	6.45
PCB 156	µg/kg	2.90	0.314	10.8	5	3.00	0.200	0.175	6.05

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobutadiene	µg/kg	0.782	0.204	26.2	5	0.825	0.123	0.114	14.6
hexachlorobenzene	µg/kg	0.869	0.344	39.6	5	1.14	0.135	0.192	22.1
1,2,4 trichlorobenzene	µg/kg	12.0	4.61	38.4	6	11.8	2.25	2.35	19.6
1,3,5 trichlorobenzene	µg/kg	5.69	1.59	27.9	6	5.50	0.979	0.810	14.2
p,p'-DDT	µg/kg	377	135	35.9	13	367	72.5	46.9	12.4
o,p'-DDT	µg/kg	78.8	29.7	37.7	10	81.2	16.9	11.7	14.9
o,p'-DDE	µg/kg	2.48	0.609	24.5	8	2.48	0.419	0.269	10.8
p,p'-DDD	µg/kg	59.3	43.9	74.0	12	64.1	28.3	15.8	26.7
o,p'-DDD	µg/kg	12.7	5.07	40.0	11	12.5	3.37	1.91	15.1

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
EOX	mg/kg	1.41	0.291	20.6	7	1.47	0.168	0.137	9.74

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mo	mg/kg	1.05	0.217	20.6	14	1.10	0.158	0.072	6.88
Sb	mg/kg	1.06	0.507	47.9	5	1.22	0.329	0.283	26.8
Sn	mg/kg	9.87	0.796	8.1	5	9.92	0.450	0.445	4.51
V	mg/kg	32.9	13.2	40.2	4	32.1	7.60	8.28	25.1



Indicative Values SETOC 694

Method: Experimental

Element

Tributyl Tin (TBT)

Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
µg/kg	32.9	6.54	19.9	6	33.7	3.01	3.34	10.1