WAGENINGEN EVALUATING PROGRAMS

FOR ANALYTICAL LABORATORIES

Certificate of Analysis

International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 706

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis SETOC 706

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 706 of Sediment, from Netherlands, is prepared for the WEPAL proficiency programs. The sample has been used in 4 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
2003	2	3
1997	2	1
1995	2	4
1993	1	2

Consensus Values SETOC 706

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	1.63	0.404	24.8	61	1.65	0.200	0.065	3.97
Cr	mg/kg	2.69	0.823	30.6	67	2.80	0.470	0.126	4.67
Pb	mg/kg	4.07	0.881	21.6	71	4.10	0.500	0.131	3.21
Zn	mg/kg	15.3	1.95	12.8	96	15.1	1.00	0.249	1.63

Indicative Values SETOC 706

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	4.92	7.25	147.2	26	8.50	6.40	1.78	36.1
acenaphthylene	µg/kg	2.26	5.52	243.9	15	5.00	4.99	1.78	78.7
acenaphthene	µg/kg	2.15	4.36	202.5	17	5.00	4.60	1.32	61.4
fluorene	µg/kg	2.65	5.11	193.1	25	5.00	4.16	1.28	48.3
phenanthrene	µg/kg	6.50	8.33	128.2	51	10.0	7.93	1.46	22.4
anthracene	µg/kg	2.69	5.40	200.8	27	10.0	9.21	1.30	48.3
fluoranthene	µg/kg	6.48	8.82	136.0	48	10.0	7.25	1.59	24.5
pyrene	µg/kg	3.16	3.80	120.2	42	4.00	3.00	0.733	23.2
chrysene	µg/kg	1.60	1.87	116.8	36	2.08	1.15	0.390	24.3
benz(a)anthracene	µg/kg	1.43	1.60	111.9	34	2.00	1.11	0.344	24.0
benzo(b)fluoranthene	µg/kg	3.51	4.22	120.4	33	5.00	3.34	0.919	26.2
benzo(k)fluoranthene	µg/kg	1.23	1.40	114.0	28	2.00	1.10	0.331	26.9
benzo(a)pyrene	µg/kg	1.25	1.63	130.6	31	2.10	1.12	0.366	29.3
dibenz(ah)anthracene	µg/kg	1.57	4.46	284.2	23	4.00	3.84	1.16	74.1
indeno(1,2,3-cd)pyrene	µg/kg	2.25	3.00	133.0	31	3.00	2.00	0.673	29.9
benzo(ghi)perylene	µg/kg	1.62	1.75	108.1	30	2.33	1.42	0.400	24.7

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	0.233	0.246	105.6	17	0.290	0.190	0.075	32.0
PCB 052	µg/kg	0.385	0.689	178.9	17	0.600	0.510	0.209	54.2
PCB 101	µg/kg	0.314	0.394	125.4	19	0.360	0.260	0.113	36.0
PCB 118	µg/kg	0.383	0.683	178.4	8	0.430	0.385	0.302	78.8
PCB 138	µg/kg	0.532	0.442	83.1	29	1.00	0.800	0.103	19.3
PCB 153	µg/kg	0.682	0.588	86.2	29	1.00	0.670	0.136	20.0
PCB 180	µg/kg	0.773	0.623	80.7	29	1.00	0.570	0.145	18.7

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
gamma-HCH	µg/kg	0.489	0.319	65.2	8	1.50	1.39	0.141	28.8
p,p`-DDT	µg/kg	0.496	0.307	61.9	7	1.70	0.860	0.145	29.3
p,p`-DDE	µg/kg	0.496	0.330	66.5	8	2.09	1.59	0.146	29.4

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	11.8	12.5	105.3	14	16.5	10.3	4.16	35.2
AOX	mg/kg	13.0	4.11	31.6	13	13.6	2.30	1.42	11.0

Indicative Values SETOC 706

Method: Other parameters									(cont.)
Element	**Unit**	**Mean**	**Std.Dev.**	**CV %**	**N**	**Median**	**MAD**	**Uncertainty**	**Rel.Uncert. %**
EOX	mg/kg	0.052	0.052	101.0	19	0.300	0.250	0.015	29.0
Organic carbon	g/kg	1.58	0.696	44.1	21	1.80	0.400	0.190	12.0
Particles < 2 µm	%	1.07	1.04	97.9	21	1.00	0.800	0.285	26.7
Particles < 63 µm	%	1.00	1.04	103.3	9	1.20	0.690	0.432	43.1
CN - Total	mg/kg	0.074	0.080	107.8	9	0.120	0.060	0.033	44.9

Method: Metals									
Element	**Unit**	**Mean**	**Std.Dev.**	**CV %**	**N**	**Median**	**MAD**	**Uncertainty**	**Rel.Uncert. %**
Cd	mg/kg	0.075	0.059	78.5	33	0.100	0.050	0.013	17.1
Cu	mg/kg	1.01	0.542	53.4	58	1.20	0.355	0.089	8.77
Hg	mg/kg	0.021	0.018	87.0	35	0.030	0.020	0.004	18.4
Ni	mg/kg	1.17	0.483	41.3	55	1.35	0.350	0.081	6.96