



WEPAL-QUASIMEME

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 690

2026-Jul-30



Certificate of Analysis SETOC 690

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 measurand 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.

Please note: Most WEPAL-QUASIMEME reference materials are found to be stable over the long term (>10 years) for most measurand/matrix combinations. There are a few exceptions known to us as being less stable over the long term. These are organotins in sediment (MS6), ASP in shellfish (BT7), some PAHs and PCBs in sediment (SETOC) and N-NH₄ (as N) & N-NO₃ (as N) in clay soils (ISE).

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 690 of Sediment, from Germany, is prepared for the WEPAL proficiency programs. The sample has been used in 4 rounds. The results on which the values in this report are based were taken from the rounds given in the following table:

Year	Round	Number
2026	2	3
2024	4	1
2021	1	4
2018	2	4



Consensus Values SETOC 690

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
acenaphthylene	µg/kg	493	200	40.5	84	483	118	27.2	5.53
acenaphthene	µg/kg	89.8	36.6	40.7	85	90.1	25.1	4.96	5.52
fluorene	µg/kg	319	143	44.7	88	320	102	19.0	5.96
phenanthrene	µg/kg	3979	786	19.7	109	3896	557	94.1	2.36
anthracene	µg/kg	509	208	40.9	108	522	122	25.0	4.92
fluoranthene	µg/kg	7475	1275	17.1	109	7391	808	153	2.04
pyrene	µg/kg	4443	923	20.8	90	4396	578	122	2.74
chrysene	µg/kg	3248	688	21.2	107	3220	462	83.1	2.56
benz(a)anthracene	µg/kg	2005	556	27.8	109	1962	376	66.6	3.32
benzo(b)fluoranthene	µg/kg	3253	729	22.4	83	3254	476	100	3.08
benzo(k)fluoranthene	µg/kg	1541	294	19.1	106	1540	180	35.7	2.32
benzo(a)pyrene	µg/kg	1468	326	22.2	109	1477	236	39.0	2.65
dibenz(ah)anthracene	µg/kg	481	103	21.3	89	480	65.3	13.6	2.82
indeno(1,2,3-cd)pyrene	µg/kg	1827	314	17.2	108	1804	187	37.8	2.07
benzo(ghi)perylene	µg/kg	1668	275	16.5	108	1676	179	33.0	1.98
EPA ΣPAH(16)	µg/kg	34147	5962	17.5	62	33929	4062	946	2.77

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 028	µg/kg	4.06	1.70	41.8	82	4.17	1.12	0.234	5.77
PCB 052	µg/kg	27.2	5.32	19.5	101	27.2	3.05	0.662	2.43
PCB 101	µg/kg	74.4	14.2	19.1	101	74.4	8.22	1.76	2.37
PCB 105	µg/kg	10.5	1.93	18.3	23	10.7	1.10	0.503	4.78
PCB 118	µg/kg	35.3	6.72	19.0	99	35.4	4.16	0.844	2.39
PCB 128	µg/kg	15.1	1.37	9.0	18	15.0	0.750	0.402	2.66
PCB 138	µg/kg	105	28.9	27.4	102	103	19.2	3.58	3.39
PCB 149	µg/kg	98.7	3.68	3.7	11	99.0	2.00	1.39	1.40
PCB 153	µg/kg	115	21.2	18.3	102	115	11.9	2.62	2.27
PCB 156	µg/kg	11.0	2.11	19.1	19	11.1	1.10	0.604	5.49
PCB 180	µg/kg	72.9	13.2	18.1	100	72.1	9.25	1.65	2.27
ΣPCB(7)	µg/kg	451	76.4	17.0	50	453	50.8	13.5	3.00

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
p,p'-DDE	µg/kg	17.4	3.80	21.9	37	16.5	2.85	0.780	4.49
p,p'-DDD	µg/kg	9.32	2.30	24.7	28	9.59	1.59	0.544	5.84



Consensus Values SETOC 690

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Mineral oil, GC	mg/kg	1264	335	26.5	85	1280	240	45.5	3.60
Organic carbon	g/kg	35.2	3.79	10.8	54	35.3	2.30	0.645	1.84
Inorganic carbon	g/kg	25.7	2.74	10.6	11	26.1	1.54	1.03	4.01
CN - Total	mg/kg	5.71	1.18	20.6	38	5.69	0.714	0.238	4.18

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
As	mg/kg	11.1	1.39	12.5	48	11.1	0.890	0.251	2.26
Cd	mg/kg	3.97	0.423	10.7	49	3.94	0.280	0.076	1.90
Cr	mg/kg	155	17.8	11.4	48	154	12.3	3.21	2.07
Cu	mg/kg	139	17.3	12.5	48	140	10.0	3.13	2.25
Hg	mg/kg	0.522	0.067	12.8	51	0.535	0.037	0.012	2.24
Ni	mg/kg	35.2	4.90	13.9	48	35.3	3.21	0.883	2.51
Pb	mg/kg	72.3	7.72	10.7	50	72.0	4.95	1.36	1.89
Zn	mg/kg	484	46.2	9.5	50	487	30.3	8.16	1.69
Ba	mg/kg	407	39.2	9.6	35	405	26.0	8.29	2.03
Co	mg/kg	8.99	1.05	11.7	41	9.10	0.730	0.206	2.29
Mo	mg/kg	1.26	0.249	19.7	33	1.30	0.126	0.054	4.29
Sn	mg/kg	12.7	1.07	8.4	13	12.9	0.501	0.371	2.93

Indicative Values SETOC 690

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
naphthalene	µg/kg	91.3	46.0	50.4	97	94.0	30.6	5.84	6.40
VROMΣPAH10	µg/kg	22167	1886	8.5	5	22296	1117	1054	4.76

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
PCB 031	µg/kg	3.58	1.60	44.6	5	3.90	0.900	0.893	25.0
PCB 114	µg/kg	0.724	0.320	44.2	4	0.806	0.171	0.200	27.6
PCB 123	µg/kg	3.00	1.32	43.8	9	3.50	0.600	0.548	18.3
PCB 126	µg/kg	0.872	0.870	99.8	8	2.93	0.295	0.384	44.1
PCB 157	µg/kg	1.34	0.359	26.9	10	1.50	0.200	0.142	10.6
PCB 167	µg/kg	4.90	1.05	21.4	12	4.80	0.650	0.378	7.71
PCB 169	µg/kg	1.81	1.68	92.7	10	3.51	0.630	0.662	36.6
PCB 189	µg/kg	1.92	0.572	29.8	10	2.05	0.245	0.226	11.8

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
hexachlorobenzene	µg/kg	1.16	0.318	27.3	22	1.22	0.175	0.085	7.29
1,2,4 trichlorobenzene	µg/kg	3.35	1.33	39.6	14	3.44	0.713	0.444	13.2
1,3,5 trichlorobenzene	µg/kg	0.998	0.512	51.3	11	0.966	0.276	0.193	19.3
p,p'-DDT	µg/kg	5.06	1.63	32.3	24	5.24	0.835	0.417	8.24
o,p'-DDE	µg/kg	0.929	0.262	28.2	19	1.00	0.180	0.075	8.08
o,p'-DDD	µg/kg	3.15	1.12	35.5	20	3.26	0.570	0.313	9.93

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
EOX	mg/kg	2.31	0.554	24.0	14	2.25	0.250	0.185	8.01
Particles < 2 µm	%	18.7	4.60	24.6	9	18.3	2.70	1.92	10.3
Particles < 63 µm	%	57.8	11.6	20.0	12	58.9	6.90	4.17	7.22
Particles > 63 µm	%	31.7	13.1	41.2	8	34.2	7.92	5.78	18.2

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
Sb	mg/kg	1.14	0.295	26.0	11	1.25	0.225	0.111	9.78
V	mg/kg	42.6	12.5	29.3	14	40.9	6.22	4.17	9.77



Indicative Values SETOC 690

Method: Dibenzofuran

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
2,3,7,8 Cl4DF	ng/kg	9.38	2.97	31.6	4	9.68	1.60	1.85	19.8
1,2,3,4,7,8 Cl6DF	ng/kg	14.2	4.02	28.2	4	15.3	2.15	2.51	17.7
2,3,4,6,7,8 Cl6DF	ng/kg	4.26	1.87	43.8	4	4.67	0.989	1.17	27.4
1,2,3,4,6,7,8 Cl7DF	ng/kg	57.2	7.96	13.9	4	57.2	3.61	4.97	8.69
1,2,3,4,7,8,9 Cl7DF	ng/kg	6.75	3.17	46.9	4	6.73	2.06	1.98	29.3
Cl8DF	ng/kg	140	71.2	50.7	4	144	34.4	44.5	31.7

Method: Brominated Flame Retardants

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
BDE 047	ng/kg	356	59.3	16.7	6	373	33.7	30.3	8.51
BDE 099	ng/kg	559	323	57.7	6	595	204	165	29.4

Method: Experimental

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	Rel.Uncert. %
DEHP	µg/kg	1460	228	15.6	6	1438	104	116	7.97