



**WAGENINGEN EVALUATING PROGRAMS
FOR ANALYTICAL LABORATORIES**

Certificate of Analysis



International Sediment Exchange for Tests on Organic Contaminants

REFERENCE MATERIAL

SETOC sample 756



Certificate of Analysis SETOC 756

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 756 of Sediment from Netherlands is prepared for the WEPAL proficiency programs. The sample is used in 1 period (or round). The results on which the values in this report are based were taken from the period given in the following table.

Year	Round	Number
2001	3	1



Consensus Values SETOC 756

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
acenaphthene	µg/kg	94.4	20.19	21.4	52	96.2	13.80	3.50	88.8	-	100
benz(a)anthracene	µg/kg	1070	209	19.4	61	1070	147	33	1021	-	1128
benzo(a)pyrene	µg/kg	1040	187	17.9	61	1020	128	30	996	-	1092
benzo(b)fluoranthene	µg/kg	1210	199	16.4	55	1200	138	33	1158	-	1265
benzo(ghi)perylene	µg/kg	717	161.8	22.6	60	686	112.5	26.1	675	-	759
benzo(k)fluoranthene	µg/kg	616	131.1	21.3	57	610	90.0	21.7	581	-	651
chrysene	µg/kg	1150	212	18.4	61	1130	142	34	1100	-	1209
fluoranthene	µg/kg	2100	334	15.9	60	2090	231	54	2016	-	2189
indeno(1,2,3-cd)pyrene	µg/kg	801	161.2	20.1	60	796	110.0	26.0	759	-	842
phenanthrene	µg/kg	787	102.4	13.0	61	797	68.0	16.4	761	-	813
pyrene	µg/kg	1680	293	17.4	58	1700	202	48	1606	-	1760

Method: Metals

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
As	mg/kg	16.3	2.78	17.1	28	17.0	1.95	0.66	15.2	-	17.4
Cd	mg/kg	1.06	0.135	12.8	27	1.10	0.100	0.033	1.00	-	1.11
Cr	mg/kg	35.4	6.53	18.4	27	35.7	4.50	1.57	32.8	-	38.0
Cu	mg/kg	36.6	2.97	8.1	28	37.1	2.00	0.70	35.4	-	37.7
Hg	mg/kg	0.291	0.0436	15.0	27	0.300	0.0300	0.0105	0.274	-	0.309
Ni	mg/kg	19.3	1.74	9.0	27	19.5	1.20	0.42	18.7	-	20.0
Pb	mg/kg	68.8	4.72	6.9	28	69.1	3.15	1.12	67.0	-	70.7
Zn	mg/kg	209	11.6	5.6	28	210	8.0	2.8	204	-	213



Indicative Values SETOC 756

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
anthracene	µg/kg	177	50.6	28.6	61	179	35.0	8.1	164	-	189
dibenz(ah)anthracene	µg/kg	178	58.7	33.0	54	181	41.5	10.0	162	-	194
fluorene	µg/kg	85.9	21.88	25.5	55	85.0	15.00	3.69	80.0	-	91.8

Method: Polychlorobiphenyls

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
PCB 052	µg/kg	2.73	1.065	39.1	31	3.00	0.800	0.239	2.34	-	3.12
PCB 101	µg/kg	3.55	1.151	32.4	35	3.80	0.800	0.243	3.16	-	3.95
PCB 105	µg/kg	1.18	0.412	34.9	8	1.36	0.310	0.182	0.846	-	1.52
PCB 118	µg/kg	2.55	0.694	27.2	31	2.61	0.450	0.156	2.30	-	2.80
PCB 138	µg/kg	5.18	1.764	34.1	35	5.24	1.240	0.373	4.57	-	5.78
PCB 153	µg/kg	4.93	1.482	30.0	35	5.00	1.000	0.313	4.43	-	5.44
PCB 180	µg/kg	3.05	1.278	41.9	35	3.10	0.890	0.270	2.62	-	3.49

Method: Organochlorine pesticides

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
p,p'-DDD	µg/kg	11.7	3.31	28.3	18	12.0	2.08	0.98	10.1	-	13.3
p,p'-DDE	µg/kg	4.07	1.508	37.1	16	4.09	1.035	0.471	3.27	-	4.87

Method: Other parameters

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
EOX	mg/kg	0.662	0.2996	45.2	22	0.685	0.2050	0.0798	0.530	-	0.795
Organic carbon	g/kg	53.3	3.99	7.5	8	52.7	2.70	1.76	50.0	-	56.5
Mineral oil, GC	mg/kg	213	86.9	40.7	31	210	60.0	19.5	182	-	245
Mineral oil, IR	mg/kg	180	83.8	46.7	19	190	60.0	24.0	139	-	220
Particles < 2 µm	%	13.7	1.10	8.0	10	13.5	0.70	0.43	12.9	-	14.5



Informative Values SETOC 756

Method: Polycyclic aromatic hydrocarbons

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
acenaphthylene	µg/kg	35.3	16.45	30	50.0	22
naphthalene	µg/kg	52.0	20.00	47	50.0	12

Method: Polychlorobiphenyls

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
PCB 028	µg/kg	1.80	0.800	25	4.50	12
PCB 128	µg/kg	1.94	1.265	4		
PCB 149	µg/kg	5.30	2.210	5		
PCB 156	µg/kg	0.605	0.1650	4		

Method: Organochlorine pesticides

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
aldrin	µg/kg	0.210	0.0500	3	2.000	15
alpha-endosulfan	µg/kg	-	-	0	1.00	16
alpha-HCH	µg/kg	0.140	0.0100	3	1.000	18
beta-endosulfan	µg/kg	-	-	0	1.00	7
beta-HCH	µg/kg	-	-	0	1.00	18
delta-HCH	µg/kg	-	-	0	1.00	11
dieldrin	µg/kg	-	-	0	1.00	16
endrin	µg/kg	1.40	0.400	5	1.00	13
gamma-HCH	µg/kg	0.190	0.0800	3	1.000	17
heptachlor	µg/kg	0.210	0.1100	3	1.000	15
heptachlor epoxide	µg/kg	-	-	0	1.00	15
hexachlorobenzene	µg/kg	1.000	0.4200	5	2.000	14
o,p`-DDD	µg/kg	3.00	0.500	5	1.00	11
o,p`-DDE	µg/kg	-	-	0	1.00	15
o,p`-DDT	µg/kg	-	-	0	1.00	15
p,p`-DDT	µg/kg	4.65	1.860	12	1.00	9
pentachlorobenzene	µg/kg	-	-	0	5.00	8

Method: Other parameters

Element	Unit	Median	MAD	N	Results smaller than (<)	
					Median of <	N
AOX	mg/kg	43.0	4.00	3		
CN - Free	mg/kg	-	-	0	1.00	5



Informative Values SETOC 756

CN - Total	mg/kg	1.14	0.515	10
Inorganic carbon	g/kg	9.65	2.090	6
Particles < 63 µm	%	44.0	4.70	3

