

Appendix A: Correlation Matrix of Toxicity Test Endpoints with Chemical Analytes

Appendix A summarizes the relationship between each toxicity endpoint for all laboratory toxicity tests and each analytical chemistry parameter quantified in sediment or surface water. Parameters measured in each sample medium were compiled from the Scribe database as of March 22, 2011.

For each of the toxicity test endpoints listed below, Spearman correlations are summarized for every measured chemistry parameter that had more than two detected results (because correlations between only two data points are not useful). The Spearman non-parametric rank correlation method was used because the measured parameter and toxicity endpoint values are not normally distributed. Correlations are based on concentrations of each parameter above their detection limit (i.e., non-detect results excluded). This approach, although known to result in a bias in the correlations, was utilized to assess any possible association between parameters and toxicity endpoints.

There were 27 toxicity test endpoints correlated with 2,136 chemistry parameters measured by sample type. Sixteen of the 27 tests (5 of 11 sediment tests, 11 of 16 water tests) had at least one parameter significantly correlated with the toxicity endpoint at an overall 0.05 significance level using a Bonferonni multiple comparison adjustment. Seven toxicity endpoints had only a single chemical parameter significantly correlated. Further, three of the seven tests with no significant toxicity showed significant correlations. Overall, there were 95 significant correlations among the 2,136 assessments.

Summary tables in Appendix A are ordered as follows, after an initial overall summary table:

	Sediment	
Table A-1	Sea Urchin, 60 min	Fertilization
Table A-2	Sea Urchin, 48 hrs	Embryo Development
Table A-3	Amphipod, 10 days	Growth
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Table A-5	Amphipod, 10 days	Survival
Table A-6	Amphipod, 96 hrs	Growth
Table A-7	Amphipod, 96 hrs	Survival
Table A-8	Mysid, 48 hrs	Survival
Table A-9	Mysid, 96 hrs	Growth
Table A-10	Mysid, 96 hrs	Survival
Table A-11	Worm, 10 days	Survival
	Water	
a	Sea Urchin, 120 min	Fertilization

Table A-12	Oyster, 48 hrs	Embryo Development
Table A-13	Oyster, 48 hrs	Survival
Table A-14	Algae, 96 hrs	Growth (Inhibition)
Table A-15	Pink Shrimp, 7 days	Survival
Table A-16	Fish, 7 days	Biomass
Table A-17	Fish, 7 days	Growth
Table A-18	Fish, 7 days	Survival
Table A-19	Fish, 96 hrs	Survival
Table A-20	Mysid, 7 days	Biomass
Table A-21	Mysid, 7 days	Fecundity
Table A-22	Mysid, 7 days	Growth
Table A-23	Mysid, 7 days	Survival
Table A-24	Mysid, 96 hrs	Survival
Table A-25	Mussel, 48 hrs	Embryo Development
Table A-26	Mussel, 48 hrs	Survival
Table A-27	Diatom, 96 hrs	Growth (Inhibition)
Table A-28	List of chemical parameters not detected in any sample, by sample type	

^a - Only two samples were tested, thus no correlations are provided.

Sample	Test, Duration	Endpoint	Toxicity		Number of Parameters	Correlations	
			Samples Tested	Significant from Control		Counts of Significance	
						Bonferonni ^a	no adjustment ^b
Sediment	Sea Urchin, 60 min	Fertilization	49	3	42	0	0
	Sea Urchin, 48 hrs	Embryo Development	49	6	42	1	1
	Amphipod, 10 days	Growth	131	36	220	33	82
		Reburial	17	0	65	1	5
		Survival	425	109	269	24	42
	Amphipod, 96 hrs	Growth	74	4	188	1	7
		Survival	74	0	188	1	32
	Mysid, 48 hrs	Survival	183	20	88	1	6
	Mysid, 96 hrs	Growth	65	4	188	1	12
		Survival	65	3	188	0	3
	Worm, 10 days	Survival	111	76	88	4	12
Water	Sea Urchin, 120 min	Fertilization	2	0	--	--	--
	Oyster, 48 hrs	Embryo Development	10	1	17	0	0
		Survival	10	2	17	2	2
	Algae, 96 hrs	Growth (Inhibition)	68	8	52	4	7
	Pink shrimp, 7 days	Survival	88	0	65	5	9
	Fish, 7 days	Biomass	20	0	22	0	0
		Growth	30	0	23	5	9
		Survival	30	1	23	2	3
	Fish, 96 hrs	Survival	123	1	89	0	3
	Mysid, 7 days	Biomass	20	1	22	1	6
		Fecundity	10	0	11	0	0
		Growth	30	1	23	1	5
		Survival	30	0	23	0	1
	Mysid, 96 hrs	Survival	90	2	93	2	3
	Mussel, 48 hrs	Embryo Development	10	4	19	1	4
		Survival	10	2	19	1	2
Diatom, 96 hrs	Growth (Inhibition)	68	14	52	4	5	

^a Significance was determined at an overall 0.05 level for each test endpoint using a Bonferonni adjustment for the number of multiple comparisons.

^b Significance was determined on a per-test basis (i.e., for each test endpoint and parameter) at a 0.05 level. The overall significance level across all parameters is much higher than 0.05.

-- No correlation assessment was made for the sea urchin, 120 minute test for water because only two samples were tested.

Table A-1.

Parameter	Sediment Sea Urchin, 60-minutes Fertilization					
	N	ND	Detect Range		Corr	Pvalue
Moisture (%)	45	0	9.4	83	-0.16	0.28
Barometric pressure (mm/Hg)	40	0	756	773	-0.17	0.29
Conductivity (umhos/cm) (uS/cm)	45	0	28	51300	0.10	0.52
Nitrogen (ug/g)	38	31	300	7900	-0.16	0.73
Oxygen (% Saturation)	40	0	60	1150	0.06	0.73
pH (Standard Units)	44	0	7.7	8.7	0.02	0.89
Sulfur (ug/g)	38	32	1000	7000	-0.33	0.52
Temperature (deg C)	45	0	17.3	34.5	-0.18	0.24
Total Carbon (%)	38	9	0.1	11	0.16	0.39
Total Organic Carbon (ug/g)	38	28	1000	100000	-0.28	0.44
Turbidity (FNU)	4	0	5.9	17	-0.20	0.80
Aluminum (ug/g)	38	8	0	59000	0.02	0.90
Antimony (ug/g)	38	11	0.1	0.7	-0.17	0.40
Arsenic (ug/g)	38	0	0.1	9.6	0.16	0.34
Barium (ug/g)	38	1	1	970	0.01	0.94
Beryllium (ug/g)	38	21	0.1	1.6	-0.10	0.69
Calcium (ug/g)	38	10	1000	380000	0.24	0.21
Chromium (ug/g)	38	20	2	51	-0.03	0.90
Cobalt (ug/g)	38	26	1	10	-0.15	0.63
Copper (ug/g)	38	26	1	18	-0.22	0.49
Iron (ug/g)	38	22	1000	25000	-0.03	0.90
Lead (ug/g)	38	20	1	14	0.05	0.85
Lithium (ug/g)	38	6	1	29	0.08	0.66
Magnesium (ug/g)	38	20	0	9000	-0.29	0.25
Manganese (ug/g)	38	3	1	390	0.25	0.15
Mercury (ug/g)	38	31	0.01	0.03	-0.54	0.21
Nickel (ug/g)	38	25	1	25	-0.29	0.34
Potassium (ug/g)	38	22	0	20000	-0.03	0.92
Selenium (ug/g)	38	30	0.1	0.7	-0.37	0.37
Sodium (ug/g)	38	0	1000	18000	0.04	0.81
Strontium (ug/g)	38	0	1	890	0.09	0.57
Titanium (ug/g)	38	13	100	3400	-0.11	0.59
Vanadium (ug/g)	38	16	2	89	0.06	0.80
Zinc (ug/g)	38	17	1	73	-0.09	0.69
Benz(a)anthracene (ug/g)	44	34	0.0004	0.035	0.08	0.83
Fluoranthene (ug/g)	44	41	0.02	0.09	-0.50	0.67
Oil and Grease (ug/g)	45	28	100	580	-0.26	0.31
Perylene (ug/g)	44	40	0.015	0.089	-0.40	0.60
Phosphorus (ug/g)	38	5	10	710	0.01	0.98
Pyrene (ug/g)	44	41	0.02	0.08	0.00	1.00
UV 254 -- SDWA NPDWR (L/mgDOC*m)	33	0	1	3.3	0.02	0.91
UV 254 -- SDWA NPDWR (Standard Units)	33	0	0.015	0.297	0.01	0.94

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-2.

Parameter	Sediment					
	Sea Urchin, 48-hours					
	Embryo Development					
	N	ND	Detect Range		Corr	Pvalue
Moisture (%)	45	0	9.4	83	-0.21	0.16
Barometric pressure (mm/Hg)	40	0	756	773	0.26	0.11
Conductivity (umhos/cm) (uS/cm)	45	0	28	51300	0.28	0.06
Nitrogen (ug/g)	38	31	300	7900	-0.18	0.70
Oxygen (% Saturation)	40	0	60	1150	-0.07	0.68
pH (Standard Units)	44	0	7.7	8.7	-0.24	0.12
Sulfur (ug/g)	38	32	1000	7000	-0.21	0.69
Temperature (deg C)	45	0	17.3	34.5	-0.19	0.22
Total Carbon (%)	38	9	0.1	11	-0.26	0.17
Total Organic Carbon (ug/g)	38	28	1000	100000	-0.20	0.58
Turbidity (FNU)	4	0	5.9	17	0.60	0.40
Aluminum (ug/g)	38	8	0	59000	-0.27	0.15
Antimony (ug/g)	38	11	0.1	0.7	-0.23	0.25
Arsenic (ug/g)	38	0	0.1	9.6	0.00	0.98
Barium (ug/g)	38	1	1	970	-0.29	0.09
Beryllium (ug/g)	38	21	0.1	1.6	-0.19	0.46
Calcium (ug/g)	38	10	1000	380000	-0.10	0.62
Chromium (ug/g)	38	20	2	51	-0.34	0.16
Cobalt (ug/g)	38	26	1	10	-0.36	0.26
Copper (ug/g)	38	26	1	18	-0.34	0.27
Iron (ug/g)	38	22	1000	25000	-0.17	0.53
Lead (ug/g)	38	20	1	14	-0.33	0.18
Lithium (ug/g)	38	6	1	29	-0.24	0.18
Magnesium (ug/g)	38	20	0	9000	-0.24	0.35
Manganese (ug/g)	38	3	1	390	-0.29	0.09
Mercury (ug/g)	38	31	0.01	0.03	-0.10	0.83
Nickel (ug/g)	38	25	1	25	-0.37	0.21
Potassium (ug/g)	38	22	0	20000	-0.13	0.62
Selenium (ug/g)	38	30	0.1	0.7	-0.28	0.50
Sodium (ug/g)	38	0	1000	18000	-0.16	0.34
Strontium (ug/g)	38	0	1	890	0.08	0.63
Titanium (ug/g)	38	13	100	3400	-0.23	0.26
Vanadium (ug/g)	38	16	2	89	-0.18	0.44
Zinc (ug/g)	38	17	1	73	-0.10	0.67
Benz(a)anthracene (ug/g)	44	34	0.0004	0.035	0.10	0.79
Fluoranthene (ug/g)	44	41	0.02	0.09	-1.00	0.00
Oil and Grease (ug/g)	45	28	100	580	0.11	0.69
Perylene (ug/g)	44	40	0.015	0.089	-0.40	0.60
Phosphorus (ug/g)	38	5	10	710	-0.28	0.12
Pyrene (ug/g)	44	41	0.02	0.08	-0.87	0.33
UV 254 -- SDWA NPDWR (L/mgDOC*m)	33	0	1	3.3	-0.32	0.07
UV 254 -- SDWA NPDWR (Standard Units)	33	0	0.015	0.297	-0.34	0.05

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-3.

Parameter	Sediment Amphipod, 10-days Growth					Pvalue
	N	ND	Detect Range		Corr	
0.001 mm (% passing)	128	44	0.5	55.5	0.05	0.66
0.002 mm (% passing)	128	40	0.5	62.5	0.05	0.65
0.005 mm (% passing)	128	38	0.5	75.5	0.00	0.97
0.02 mm (% passing)	128	33	0.5	93	-0.05	0.66
0.05 mm (% passing)	128	17	0.5	98	0.15	0.10
0.064 mm (% passing)	128	6	0.5	99	0.29	0.00
0.075 mm (% passing)	129	2	0.65	99.2	0.32	0.00
0.15 mm (% passing)	129	0	0.71	99.7	0.28	0.00
0.3 mm (% passing)	129	0	2.1	99.8	0.26	0.00
0.6 mm (% passing)	129	0	9.5	99.9	0.24	0.01
1.18 mm (% passing)	129	0	20	99.9	0.14	0.11
19 mm (% passing)	129	0	92.3	100	-0.03	0.72
2.36 mm (% passing)	129	0	31.3	100	0.07	0.46
3.35 mm (% passing)	129	0	38	100	-0.05	0.59
37.5 mm (% passing)	129	0	100	100	NA	NA
4.75 mm (% passing)	129	0	47.3	100	-0.07	0.43
75 mm (% passing)	129	0	100	100	NA	NA
Clay (%)	128	38	0.5	75.5	0.00	0.97
Gravel (%)	129	109	0.5	52.7	-0.18	0.45
Sand (%)	129	0	0.7	99.6	-0.31	0.00
Silt (%)	128	2	0.5	67.6	0.33	0.00
Moisture (%)	126	0	4.8	76.7	0.36	0.00
Total Carbon (%)	66	36	0.0321	6.1	0.03	0.89
Total Organic Carbon (ug/g)	126	41	197	48900	0.11	0.33
Aluminum (ug/g)	66	0	8.36	29900	0.37	0.00
Antimony (ug/g)	66	30	0.0364	0.67	0.06	0.71
Arsenic (ug/g)	66	0	0.0737	12.1	0.29	0.02
Barium (ug/g)	66	7	0.103	371	0.08	0.55
Beryllium (ug/g)	66	20	0.0092	1.67	-0.13	0.39
Cadmium (ug/g)	66	39	0.0123	0.928	0.16	0.42
Chromium (ug/g)	66	25	0.64	33.5	-0.11	0.48
Cobalt (ug/g)	66	35	0.251	12.3	-0.44	0.01
Copper (ug/g)	66	32	0.298	19	0.01	0.96
Iron (ug/g)	66	1	10.2	31200	0.25	0.04
Lead (ug/g)	66	2	0.0723	32.6	0.26	0.04
Manganese (ug/g)	66	4	0.352	1020	0.29	0.02
Mercury (ug/g)	66	49	0.0048	0.0382	0.26	0.32
Nickel (ug/g)	66	26	0.284	30.2	-0.43	0.01
Silver (ug/g)	66	43	0.0062	0.115	0.10	0.66
Thallium (ug/g)	66	36	0.0205	0.474	-0.17	0.36
Vanadium (ug/g)	66	5	0.206	60	0.30	0.02
Zinc (ug/g)	66	28	0.776	99.8	-0.12	0.46
15a-methyl-17a(H)-27-Norhopane (ug/g)	130	93	0.000083	0.00391	0.31	0.06
2,6,10 Trimethyldodecane (1380) (ug/g)	130	126	0.00081	0.01263	0.40	0.60
2,6,10 Trimethyltridecane (1470) (ug/g)	130	118	0.00197	0.019	0.62	0.03

Table A-3.

Parameter	Sediment Amphipod, 10-days Growth					
	N	ND	Detect Range		Corr	Pvalue
A1-C20-TAS (ug/g)	130	96	0.00012	0.0021	0.08	0.65
A2-C21-TAS (ug/g)	130	87	0.00011	0.0019	0.06	0.72
A3-C26 TAS(20S) (ug/g)	130	54	0.0001	0.00344	0.16	0.17
A4-C26/C27-TAS (ug/g)	130	51	0.00007	0.00547	0.29	0.01
A5-C27-TAS(20R) (ug/g)	130	56	0.000081	0.00366	0.30	0.01
A6-TAS(20S) (ug/g)	130	53	0.00007	0.00521	0.35	0.00
A7-TAS(20R) (ug/g)	130	59	0.000087	0.00359	0.32	0.01
Acenaphthene (ug/g)	130	68	0.00004	0.008	0.36	0.00
Acenaphthylene (ug/g)	130	68	0.00003	0.0042	0.31	0.02
Anthracene (ug/g)	130	58	0.00003	0.012	0.24	0.04
Benz(a)anthracene (ug/g)	130	58	0.00011	0.07	0.31	0.01
Benzo(a)pyrene (ug/g)	130	61	0.00019	0.049	0.36	0.00
Benzo(b)fluoranthene (ug/g)	130	55	0.00027	0.093	0.35	0.00
Benzo(e)pyrene (ug/g)	130	63	0.00026	0.049	0.34	0.00
Benzo(g,h,i)perylene (ug/g)	130	61	0.00022	0.02	0.29	0.02
Benzo(k)fluoranthene (ug/g)	130	61	0.00022	0.072	0.30	0.01
Biphenyl (ug/g)	130	62	0.00006	0.0022	0.18	0.14
C1-Benzanthrene/chrysenes (ug/g)	130	50	0.00029	0.039	0.26	0.02
C1-Dibenzothiophenes (ug/g)	130	70	0.00007	0.01286	0.16	0.21
C1-Fluoranthrenes/pyrenes (ug/g)	130	51	0.00028	0.091	0.30	0.01
C1-Fluorenes (ug/g)	130	68	0.00011	0.0087	0.09	0.49
C1-Naphthalenes (ug/g)	130	53	0.00014	0.021	0.21	0.07
C1-Naphthobenzothiophenes (ug/g)	66	58	0.001	0.011	-0.40	0.33
C1-Phenanthrenes/anthracenes (ug/g)	130	55	0.00032	0.056	0.11	0.36
C2-Benzanthrene/chrysenes (ug/g)	130	66	0.00039	0.018	0.23	0.07
C2-Dibenzothiophenes (ug/g)	130	60	0.00015	0.034	0.17	0.16
C2-Fluoranthrenes/pyrenes (ug/g)	130	59	0.0003	0.025	0.26	0.03
C2-Fluorenes (ug/g)	130	80	0.0004	0.016	0.24	0.09
C2-Naphthalenes (ug/g)	130	58	0.00022	0.024	0.15	0.21
C2-Naphthobenzothiophenes (ug/g)	66	59	0.0014	0.013	-0.42	0.35
C2-Phenanthrenes/anthracenes (ug/g)	130	48	0.00052	0.084	0.11	0.34
C3-Benzanthrene/chrysenes (ug/g)	130	90	0.0011	0.01124	0.11	0.48
C3-Dibenzothiophenes (ug/g)	130	69	0.00024	0.02	0.20	0.12
C3-Fluoranthrenes/pyrenes (ug/g)	130	70	0.00054	0.013	0.33	0.01
C3-Fluorenes (ug/g)	130	90	0.00107	0.021	0.17	0.31
C3-Naphthalenes (ug/g)	130	61	0.0003	0.011	0.02	0.90
C3-Naphthobenzothiophenes (ug/g)	66	60	0.00085	0.0074	-0.23	0.66
C3-Phenanthrenes/anthracenes (ug/g)	130	59	0.00035	0.044	0.21	0.08
C4-Benzanthrene/chrysenes (ug/g)	130	108	0.00037	0.0087	0.24	0.28
C4-Dibenzothiophenes (ug/g)	64	26	0.00059	0.00742	0.27	0.11
C4-Naphthalenes (ug/g)	130	81	0.00035	0.014	-0.02	0.90
C4-Phenanthrenes/anthracenes (ug/g)	130	77	0.00052	0.026	0.21	0.14
Cholestane (ug/g)	130	48	0.0002	0.027	0.28	0.01
Chrysene (ug/g)	130	51	0.00022	0.2	0.29	0.01
D1-Diasterane-27[S] (ug/g)	64	22	0.00045	0.01049	0.29	0.06

Table A-3.

Parameter	Sediment Amphipod, 10-days Growth					
	N	ND	Detect Range		Corr	Pvalue
D2-Diasterane-27[R] (ug/g)	64	29	0.00038	0.00635	0.23	0.18
D3a-Diasterane-28[S] (ug/g)	64	25	0.00034	0.00729	0.24	0.14
D3-Diasterane-28[S] (ug/g)	64	26	0.00038	0.00559	0.25	0.13
D4a-Diasterane-28[R] (ug/g)	64	24	0.0003	0.00692	0.24	0.14
D4-Diasterane-28[R] (ug/g)	64	42	0.00027	0.00293	0.33	0.13
D5-Diasterane-29[S] (ug/g)	64	14	0.00027	0.01112	0.40	0.00
D6-Diasterane-29[R] (ug/g)	64	17	0.00023	0.01064	0.38	0.01
Dibenz(a,h)anthracene (ug/g)	130	81	0.00005	0.0064	0.24	0.10
Dibenzofuran (ug/g)	64	2	0.00004	0.00264	0.32	0.01
Dibenzothiophene (ug/g)	130	62	0.00002	0.0047	0.23	0.05
Fluoranthene (ug/g)	130	49	0.0002	0.034	0.24	0.03
Fluorene (ug/g)	130	60	0.00003	0.0055	0.32	0.01
Indeno(1,2,3-cd)pyrene (ug/g)	130	59	0.00019	0.031	0.31	0.01
Naphthalene (ug/g)	129	75	0.00053	0.012	0.16	0.26
Naphthobenzothiophene (ug/g)	66	61	0.0015	0.02	0.00	1.00
n-Decane (C10) (ug/g)	130	121	0.00099	0.024	0.10	0.79
n-Dodcosane (C22) (ug/g)	130	73	0.00377	81.29	0.20	0.14
n-Dodecane (C12) (ug/g)	130	122	0.00249	0.046	0.54	0.17
n-Dotriacontane (C32) (ug/g)	130	81	0.01169	1031.54	0.39	0.01
n-Eicosane (C20) (ug/g)	130	109	0.00913	30.39	0.16	0.48
n-Heneicosane (C21) (ug/g)	130	77	0.00726	98.14	0.31	0.03
n-Hentriacontane (C31) (ug/g)	130	85	0.01267	2.7	-0.10	0.53
n-Heptacosane (C27) (ug/g)	130	94	0.014	801.1	0.22	0.20
n-Heptadecane (C17) (ug/g)	130	88	0.00565	16.96	0.06	0.71
n-Heptatriacontane (C37) (ug/g)	129	87	0.00266	0.22	0.10	0.55
n-Hexacosane (C26) (ug/g)	130	102	0.015	1.1	0.41	0.03
n-Hexadecane (C16) (ug/g)	130	82	0.00219	11.32	0.06	0.68
n-Hexatriacontane (C36) (ug/g)	130	83	0.00685	358.43	0.09	0.56
n-Nonacosane (C29) (ug/g)	130	86	0.012	870.52	0.17	0.26
n-Nonadecane (C19) (ug/g)	130	112	0.00417	28	0.07	0.77
n-Nonatriacontane (C39) (ug/g)	130	98	0.00235	28.59	0.27	0.14
n-Octacosane (C28) (ug/g)	130	101	0.013	0.78	0.41	0.03
n-Octadecane (C18) (ug/g)	130	103	0.00579	17.73	-0.01	0.96
n-Octatriacontane (C38) (ug/g)	130	83	0.00189	0.28	0.07	0.65
Nonane (ug/g)	130	123	0.00244	0.016	-0.47	0.29
Norpristane (1650) (ug/g)	130	112	0.0015	0.66	0.28	0.26
n-Pentacosane (C25) (ug/g)	130	100	0.01083	2.5	0.04	0.82
n-Pentadecane (C15) (ug/g)	130	96	0.00671	21.88	0.21	0.22
n-Pentatriacontane (C35) (ug/g)	130	85	0.00594	461.48	0.25	0.10
n-Tetracontane (C40) (ug/g)	130	79	0.00168	22.26	0.10	0.47
n-Tetracosane (C24) (ug/g)	130	83	0.01619	136.02	0.18	0.22
n-Tetradecane (C14) (ug/g)	130	96	0.00137	6	-0.20	0.26
n-Tetratriacontane (C34) (ug/g)	130	90	0.01066	385.56	0.31	0.05
n-Tricontane (C30) (ug/g)	130	105	0.02667	1.2	-0.15	0.48
n-Tricosane (C23) (ug/g)	130	74	0.00357	202.81	0.27	0.04

Table A-3.

Parameter	Sediment Amphipod, 10-days Growth					
	N	ND	Detect Range		Corr	Pvalue
n-Tridecane (C13) (ug/g)	130	115	0.00109	0.19	-0.20	0.47
n-Tritriacontane (C33) (ug/g)	130	79	0.00704	1095.75	0.31	0.03
n-Undecane (C11) (ug/g)	130	124	0.00285	0.042	-0.03	0.95
Perylene (ug/g)	130	54	0.00088	0.23779	0.35	0.00
Phenanthrene (ug/g)	130	48	0.00012	0.01542	0.27	0.01
Phytane (ug/g)	130	98	0.00317	12.27	-0.02	0.92
Pristane (ug/g)	130	94	0.00377	14.75	0.15	0.39
Pyrene (ug/g)	130	47	0.00025	0.1	0.27	0.01
S10-Methylcholestane (ug/g)	130	78	0.00013	0.015	0.12	0.41
S11-Methylcholestane (ug/g)	130	71	0.0002	0.00846	0.24	0.07
S12-Cholestane (ug/g)	130	48	0.00018	0.03054	0.27	0.01
S14-CHOLESTANE (20R) (ug/g)	130	62	0.00011	0.015	0.13	0.30
S15-Cholestane (20S) (ug/g)	130	64	0.000094	0.01288	0.19	0.12
S18-Ethylcholestane (ug/g)	130	73	0.000085	0.00837	0.26	0.05
S19-Ethylcholestane (ug/g)	130	110	0.000094	0.0018	-0.06	0.82
S1-Pregnane (ug/g)	64	39	0.00122	0.00971	0.39	0.06
S20-Methylcholestane (ug/g)	130	62	0.000079	0.01015	0.37	0.00
S22-Methylcholestane(20R) (ug/g)	130	57	0.00011	0.01287	0.22	0.06
S23-Methylcholestane(20S) (ug/g)	130	56	0.000095	0.01535	0.22	0.06
S24-Methylcholestane (ug/g)	130	58	0.000087	0.00765	0.27	0.02
S25-Ethylcholestane (ug/g)	130	54	0.0001	0.00983	0.30	0.01
S26-Ethylcholestane(20R) (ug/g)	130	44	0.00012	0.01798	0.31	0.00
S27-Ethylcholestane(20S) (ug/g)	130	46	0.0001	0.01618	0.30	0.01
S28-Ethylcholestane (ug/g)	130	49	0.000097	0.01135	0.30	0.01
S29-C30cholestane(R) (ug/g)	64	57	0.00025	0.00409	0.64	0.12
S30-C30cholestane(S) (ug/g)	64	38	0.00024	0.00333	0.47	0.02
S4-Dicholestane (ug/g)	130	57	0.00012	0.02	0.25	0.04
S5-Dicholestane (ug/g)	130	72	0.000089	0.01129	0.25	0.06
S6-Dicholestane (ug/g)	130	96	0.00012	0.0056	0.15	0.40
S7-Dicholestane (ug/g)	130	69	0.000079	0.01029	0.12	0.34
S8-Methylcholestane (ug/g)	130	67	0.000092	0.01117	0.16	0.21
Sa-C21Diasterane (ug/g)	64	41	0.0009	0.00677	0.39	0.07
Sb-C21Sterane (ug/g)	64	33	0.00086	0.01007	0.10	0.58
Sc-C22Diasterane (ug/g)	64	60	0.00083	0.00179	-0.32	0.68
Sd-C22Sterane (ug/g)	64	52	0.00103	0.00434	0.40	0.19
T0-C19Diterpane (ug/g)	64	44	0.00014	0.00079	-0.03	0.91
T10-C29Tricyclitriterpane(R) (ug/g)	130	117	0.00012	0.00181	0.22	0.47
T11-Trisnorhopane(TS) (ug/g)	130	73	0.000084	0.00532	0.35	0.01
T12-Trisnorhopane(TM) (ug/g)	130	57	0.00008	0.00746	0.46	0.00
T13a-29,30-Bisnorhopane (ug/g)	130	93	0.00026	0.00459	0.39	0.02
T14a-C28,C30Bisnorhopane (ug/g)	130	117	0.00042	0.0022	0.31	0.30
T14-Bisnorhopane (ug/g)	130	123	0.00081	0.00264	0.50	0.25
T15-C29-Norhopane (ug/g)	130	33	0.000092	0.01998	0.45	0.00
T16-Norneohopane (ug/g)	130	68	0.000099	0.0071	0.40	0.00
T17-C30-Normoretane (ug/g)	130	70	0.000085	0.01453	0.53	0.00

Table A-3.

Parameter	Sediment					
	Amphipod, 10-days					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
T18-C30-Oleanane (ug/g)	130	122	0.00069	0.00225	0.39	0.35
T19-C30 Hopane (ug/g)	130	24	0.00012	0.03419	0.32	0.00
T1-C20Diterpane (ug/g)	64	25	0.00013	0.00224	0.35	0.03
T20-Moretane (ug/g)	130	52	0.0001	0.01584	0.44	0.00
T21-C31-Homohopane(S) (ug/g)	130	48	0.00012	0.01601	0.38	0.00
T22a-Gammacerane (ug/g)	130	115	0.00033	0.00176	0.03	0.92
T22-C31-Homohopane(R) (ug/g)	130	34	0.0001	0.02224	0.40	0.00
T23-Homohopane (ug/g)	66	51	0.000089	0.0028	-0.23	0.40
T24-Homomoretane (ug/g)	130	115	0.0001	0.0053	-0.07	0.79
T25-Diploptene (ug/g)	130	99	0.00026	0.04016	0.61	0.00
T26-C32-Bishomohopane(S) (ug/g)	130	50	0.00013	0.01401	0.47	0.00
T27-C32-Bishomohopane(R) (ug/g)	130	70	0.000088	0.01573	0.41	0.00
T28-Bishomomoretane (ug/g)	130	76	0.00015	0.01533	0.47	0.00
T29-Homohopane (ug/g)	130	122	0.00065	0.00316	0.17	0.69
T2-C21Diterpane (ug/g)	64	31	0.00041	0.00317	0.16	0.38
T30-C33-Trishomohopane(S) (ug/g)	130	53	0.000093	0.0144	0.38	0.00
T31-C33-Trishomohopane(R) (ug/g)	130	88	0.00014	0.00529	0.29	0.06
T32-Tetrakishomohopane(S) (ug/g)	130	90	0.00011	0.01949	0.54	0.00
T33-Tetrakishomohopane(R) (ug/g)	130	114	0.0001	0.00395	0.08	0.77
T34-Pentakishomohopane(S) (ug/g)	130	114	0.0001	0.002	0.02	0.93
T35-Pentakishomohopane(R) (ug/g)	130	113	0.000083	0.00459	0.23	0.37
T3-C22Diterpane (ug/g)	64	56	0.00057	0.00137	0.59	0.12
T4-C23Diterpane (ug/g)	130	73	0.000089	0.00704	0.26	0.05
T5-C24Diterpane (ug/g)	130	82	0.0001	0.00287	0.23	0.11
T6a-C24Tetracyclic Terpane (ug/g)	130	107	0.00016	0.00214	0.39	0.07
T6b-C26Tricyclic[S] (ug/g)	130	103	0.00009	0.00636	0.39	0.05
T6-C25Diterpane (ug/g)	130	82	0.000076	0.0033	0.36	0.01
T6c-C26Tricyclic[R] (ug/g)	130	106	0.0001	0.00192	0.01	0.98
T7-C28Tricyclictriterpane[S] (ug/g)	130	115	0.00017	0.0068	0.44	0.10
T8-C28Tricyclictriterpane[R] (ug/g)	130	110	0.0001	0.00167	0.03	0.90
T9-C29Tricyclictriterpane(S) (ug/g)	130	102	0.000084	0.00179	0.28	0.15
TIC (ug/g)	66	45	321	232000	-0.01	0.96
Aromatics, Total (ug/g)	66	33	0.00093	1	-0.25	0.15
SHC, Total (ug/g)	130	14	0.014	7030.13	0.33	0.00
SHC, Total Resolved (C9-C40) (ug/g)	66	63	6.5	67	0.50	0.67
Total PAH (ug/g)	64	0	0.00836	0.51672	0.32	0.01
TPH (Diesel Range) (C10-C28) (ug/g)	66	62	15	420	0.60	0.40
TPH (Diesel Range) (ug/g)	64	13	0.14678	45384.29	0.33	0.02
TPH, Total (C9-C40) (ug/g)	66	59	14	840	-0.09	0.85
TPH, Total (ug/g)	64	8	0.04712	117372.75	0.45	0.00

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-4.

Parameter	Sediment					
	Amphipod, 10-days					
	Reburial					
	N	ND	Detect Range		Corr	Pvalue
Gravel (%)	17	4	0	0	NA	NA
Sand (%)	17	0	1.9	91.4	0.50	0.04
Silt, Clay, Colloids (%)	17	0	8.6	98.1	-0.50	0.04
Moisture (%)	14	0	18.3	58.8	0.28	0.34
Ammonia as N (ug/g)	17	0	0.85	104	-0.39	0.13
Total Organic Carbon (ug/g)	17	2	915	40800	-0.03	0.91
Aluminum (ug/g)	17	0	1580	20100	-0.16	0.55
Arsenic (ug/g)	17	0	1.7	10.3	-0.11	0.68
Barium (ug/g)	17	0	11.4	471	-0.27	0.30
Beryllium (ug/g)	17	0	0.076	0.96	-0.15	0.58
Cadmium (ug/g)	17	3	0.066	0.84	0.33	0.25
Calcium (ug/g)	17	0	3070	15300	-0.31	0.23
Chromium (ug/g)	17	0	2.6	31.3	-0.19	0.47
Cobalt (ug/g)	17	0	1.8	9.5	-0.06	0.81
Copper (ug/g)	17	0	0.4	21	-0.16	0.55
Iron (ug/g)	17	0	2660	21500	-0.13	0.61
Lead (ug/g)	17	0	1.4	21.1	-0.20	0.45
Magnesium (ug/g)	17	0	1460	9160	-0.29	0.26
Manganese (ug/g)	17	0	29.1	533	-0.23	0.39
Mercury (ug/g)	17	6	0.0087	0.092	0.00	1.00
Nickel (ug/g)	17	0	4.2	27.6	-0.12	0.63
Potassium (ug/g)	17	0	347	5340	-0.23	0.38
Selenium (ug/g)	17	8	0.2	0.97	-0.41	0.27
Silver (ug/g)	17	13	0.11	0.23	NA	NA
Sodium (ug/g)	17	0	250	16900	-0.54	0.03
Vanadium (ug/g)	17	0	5.1	41.6	-0.16	0.55
Zinc (ug/g)	17	0	8.8	87.2	-0.16	0.55
Acetone (ug/g)	17	5	0.0105	0.0617	0.16	0.63
Anthracene (ug/g)	17	14	0.0036	0.006	0.87	0.33
Benz(a)anthracene (ug/g)	17	10	0.0043	0.062	0.40	0.37
Benzo(a)pyrene (ug/g)	17	10	0.0039	0.0297	0.40	0.37
Benzo(b)fluoranthene (ug/g)	17	10	0.0022	0.058	0.40	0.37
Benzo(e)pyrene (ug/g)	17	10	0.0045	0.041	0.40	0.37
Benzo(g,h,i)perylene (ug/g)	17	11	0.003	0.027	0.54	0.27
Benzo(k)fluoranthene (ug/g)	17	11	0.005	0.0214	0.13	0.80
Bis(2-ethylhexyl) phthalate (ug/g)	17	11	0.0869	0.341	NA	NA
C1-Benzanthrene/chrysenes (ug/g)	17	9	0.0052	0.053	0.08	0.85
C1-Fluoranthrenes/pyrenes (ug/g)	17	8	0.0024	0.062	0.37	0.33
C1-Fluorenes (ug/g)	17	12	0.0027	0.015	0.29	0.64
C1-Phenanthrenes/anthracenes (ug/g)	17	10	0.0051	0.04	0.27	0.56
C2-Benzanthrene/chrysenes (ug/g)	17	10	0.0041	0.052	0.27	0.56
C2-Fluoranthrenes/pyrenes (ug/g)	17	8	0.0035	0.083	0.07	0.86
C2-Fluorenes (ug/g)	17	11	0.0039	0.028	0.70	0.12
C2-Naphthalenes (ug/g)	17	12	0.0035	0.019	-0.22	0.72
C2-Phenanthrenes/anthracenes (ug/g)	17	9	0.004	0.08	-0.03	0.94

Table A-4.

Parameter	Sediment Amphipod, 10-days Reburial					
	N	ND	Detect Range		Corr	Pvalue
	C3-Benzanthrene/chrysenes (ug/g)	17	10	0.0027	0.053	0.09
C3-Fluoranthrenes/pyrenes (ug/g)	17	10	0.0051	0.081	0.27	0.56
C3-Fluorenes (ug/g)	17	11	0.0037	0.027	0.17	0.75
C3-Naphthalenes (ug/g)	17	11	0.0026	0.023	-0.30	0.56
C3-Phenanthrenes/anthracenes (ug/g)	17	9	0.003	0.081	-0.17	0.68
C4-Benzanthrene/chrysenes (ug/g)	17	11	0.0043	0.05	-0.27	0.61
C4-Naphthalenes (ug/g)	17	10	0.0036	0.024	-0.04	0.92
C4-Phenanthrenes/anthracenes (ug/g)	17	10	0.0042	0.059	-0.04	0.92
Carbon Disulfide (ug/g)	17	5	0.00061	0.0158	0.50	0.10
Chrysene (ug/g)	17	8	0.002	0.18	0.61	0.08
Dibenz(a,h)anthracene (ug/g)	17	14	0.0023	0.0068	0.87	0.33
Fluoranthene (ug/g)	17	9	0.003	0.0504	0.45	0.26
Indeno(1,2,3-cd)pyrene (ug/g)	17	11	0.0051	0.019	-0.13	0.80
Naphthalene (ug/g)	17	14	0.00191	0.0055	1.00	0.00
Oil and Grease, HEM (ug/g)	17	3	185	2490	0.61	0.02
Perylene (ug/g)	17	7	0.0028	0.25	-0.05	0.88
Phenanthrene (ug/g)	17	6	0.0025	0.0232	0.04	0.91
Pyrene (ug/g)	17	9	0.0024	0.072	0.65	0.08
TPH (Diesel Range) (C10-C28) (ug/g)	17	9	6.34	38.6	-0.10	0.81
TPH (Oil Range) (C28-C35) (ug/g)	17	7	5.21	37.4	-0.16	0.65

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-5.

Parameter	Sediment Amphipod, 10-days Survival					
	N	ND	Detect Range		Corr	Pvalue
	0.001 mm (% passing)	128	44	0.5	55.5	0.12
0.0015 mm (%)	22	2	2.8	53	-0.19	0.42
0.002 mm (% passing)	128	40	0.5	62.5	0.09	0.40
0.005 mm (% passing)	128	38	0.5	75.5	0.10	0.37
0.005 mm (%)	22	0	2.8	92	-0.23	0.29
0.02 mm (% passing)	128	33	0.5	93	0.05	0.62
0.030 mm (%)	22	0	3	100	-0.25	0.26
0.05 mm (% passing)	128	17	0.5	98	0.19	0.04
0.064 mm (% passing)	128	6	0.5	99	0.34	0.00
0.075 mm (% passing)	129	2	0.65	99.2	0.38	0.00
0.075 mm (%)	22	0	8.2	99.3	-0.30	0.17
0.15 mm (% passing)	129	0	0.71	99.7	0.35	0.00
0.15 mm (%)	22	0	18.8	99.8	-0.24	0.29
0.3 mm (% passing)	129	0	2.1	99.8	0.34	0.00
0.3 mm (%)	22	0	86.8	100	0.05	0.83
0.375 in (%)	22	0	96.8	100	-0.05	0.82
0.6 mm (% passing)	129	0	9.5	99.9	0.32	0.00
0.6 mm (%)	22	0	88.5	100	0.14	0.54
0.75 in (%)	22	0	100	100	NA	NA
1.18 mm (% passing)	129	0	20	99.9	0.21	0.02
1.18 mm (%)	22	0	94.5	100	0.11	0.62
1.5 in (%)	22	0	100	100	NA	NA
19 mm (% passing)	129	0	92.3	100	0.02	0.80
2.00 mm (%)	22	0	96	100	0.06	0.80
2.36 mm (% passing)	129	0	31.3	100	0.10	0.25
2.36 mm (%)	22	0	96.1	100	0.06	0.80
3 in (%)	22	0	100	100	NA	NA
3.35 mm (% passing)	129	0	38	100	0.03	0.76
37.5 mm (% passing)	129	0	100	100	NA	NA
4.75 mm (% passing)	129	0	47.3	100	0.03	0.76
4.75 mm (%)	22	0	96.7	100	-0.05	0.82
75 mm (% passing)	129	0	100	100	NA	NA
Clay (%)	128	38	0.5	75.5	0.10	0.37
Gravel (%)	329	169	0	52.7	-0.12	0.15
Sand (%)	329	0	0.42	99.7	-0.04	0.43
Silt (%)	128	2	0.5	67.6	0.40	0.00
Silt, Clay, Colloids (%)	201	0	0.3	99.6	-0.21	0.00
Solids (%)	10	0	28	81	0.35	0.32
Moisture (%)	333	0	4.8	85.3	0.08	0.13
Ammonia as N (ug/g)	27	6	0.85	104	-0.27	0.24
Nitrogen (ug/g)	84	0	1.25	1700	-0.16	0.15
Sulfide (Acid Soluble) (ug/g)	92	26	15	833	0.05	0.69
Total Carbon (%)	66	36	0.0321	6.1	-0.01	0.96
Total Organic Carbon (ug/g)	420	86	197	196000	-0.04	0.49
Aluminum (ug/g)	360	0	8.36	38600	0.07	0.17
Antimony (ug/g)	357	291	0.0364	17.9	-0.03	0.80

Table A-5.

Parameter	Sediment Amphipod, 10-days Survival					
	N	ND	Detect Range		Corr	Pvalue
Arsenic (ug/g)	360	3	0.0737	46.2	0.03	0.55
Barium (ug/g)	360	10	0.103	3980	0.14	0.01
Beryllium (ug/g)	360	55	0.0082	45.8	-0.14	0.02
Cadmium (ug/g)	360	168	0.0123	43	0.11	0.13
Calcium (ug/g)	294	0	135	71600	-0.09	0.11
Chromium (ug/g)	360	31	0.44	59.7	-0.07	0.20
Cobalt (ug/g)	360	53	0.04	47.5	0.00	0.94
Copper (ug/g)	360	45	0.18	101	-0.07	0.25
Iron (ug/g)	360	1	10.2	62700	0.05	0.36
Lead (ug/g)	360	5	0.0723	1190	0.04	0.43
Magnesium (ug/g)	294	0	220	13100	-0.06	0.30
Manganese (ug/g)	360	6	0.352	1520	0.07	0.17
Mercury (ug/g)	360	122	0.00024	0.416	-0.07	0.26
Nickel (ug/g)	360	32	0.08	62.6	0.03	0.57
Potassium (ug/g)	294	4	65.2	8330	-0.02	0.69
Selenium (ug/g)	294	89	0.19	43.7	-0.05	0.44
Silver (ug/g)	360	274	0.0062	0.37	-0.06	0.58
Sodium (ug/g)	294	0	77.9	31200	-0.21	0.00
Strontium (ug/g)	10	0	1.8	150	-0.69	0.03
Thallium (ug/g)	351	253	0.0205	47.5	-0.15	0.13
Titanium (ug/g)	10	3	1	38	-0.74	0.06
Vanadium (ug/g)	360	11	0.206	77	0.04	0.41
Yttrium (ug/g)	10	6	0.5	20	-0.80	0.20
Zinc (ug/g)	360	34	0.44	221	0.02	0.67
15a-methyl-17a(H)-27-Norhopane (ug/g)	130	93	0.000083	0.00391	0.21	0.22
1-Methylnaphthalene (ug/g)	208	193	0.00123	0.0087	-0.03	0.92
2,6,10 Trimethyldodecane (1380) (ug/g)	130	126	0.00081	0.01263	0.40	0.60
2,6,10 Trimethyltridecane (1470) (ug/g)	130	118	0.00197	0.019	0.38	0.22
2-Methylnaphthalene (ug/g)	294	268	0.00159	0.025	-0.21	0.31
A1-C20-TAS (ug/g)	130	96	0.00012	0.0021	-0.03	0.85
A2-C21-TAS (ug/g)	130	87	0.00011	0.0019	-0.07	0.66
A3-C26 TAS(20S) (ug/g)	130	54	0.0001	0.00344	-0.02	0.87
A4-C26/C27-TAS (ug/g)	130	51	0.00007	0.00547	0.17	0.13
A5-C27-TAS(20R) (ug/g)	130	56	0.000081	0.00366	0.09	0.43
A6-TAS(20S) (ug/g)	130	53	0.00007	0.00521	0.16	0.16
A7-TAS(20R) (ug/g)	130	59	0.000087	0.00359	0.11	0.38
Acenaphthene (ug/g)	424	354	0.00004	0.0441	0.12	0.32
Acenaphthylene (ug/g)	424	347	0.00003	0.0141	0.07	0.52
Acetone (ug/g)	294	91	0.006	0.83	-0.10	0.14
Anthracene (ug/g)	424	329	0.00003	0.191	0.13	0.22
Benz(a)anthracene (ug/g)	424	283	0.00011	1.15	0.05	0.59
Benzene (ug/g)	360	347	0.00056	0.0028	0.31	0.30
Benzo(a)pyrene (ug/g)	424	290	0.00019	1.49	0.04	0.64
Benzo(b)fluoranthene (ug/g)	424	274	0.00027	1.46	0.10	0.21
Benzo(e)pyrene (ug/g)	335	231	0.00026	0.06	0.11	0.28
Benzo(g,h,i)perylene (ug/g)	424	315	0.00022	0.516	0.03	0.77

Table A-5.

Parameter	Sediment Amphipod, 10-days Survival					
	N	ND	Detect Range		Corr	Pvalue
Benzo(k)fluoranthene (ug/g)	424	309	0.00022	0.45	0.14	0.13
Biphenyl (ug/g)	224	156	0.00006	0.0022	0.20	0.10
Bis(2-ethylhexyl) phthalate (ug/g)	294	184	0.0084	0.544	0.25	0.01
Butyl benzyl phthalate (ug/g)	294	289	0.0058	0.041	-0.36	0.55
C1-Benzanthrene/chrysenes (ug/g)	337	233	0.00029	0.0561	-0.07	0.51
C1-Dibenzothiophenes (ug/g)	130	70	0.00007	0.01286	-0.05	0.72
C1-Fluoranthrenes/pyrenes (ug/g)	336	220	0.00028	0.091	-0.03	0.76
C1-Fluorenes (ug/g)	339	268	0.00011	0.022	-0.14	0.25
C1-Naphthalenes (ug/g)	130	53	0.00014	0.021	0.19	0.09
C1-Naphthobenzothiophenes (ug/g)	66	58	0.001	0.011	-0.43	0.29
C1-Phenanthrenes/anthracenes (ug/g)	340	239	0.00032	0.106	-0.11	0.28
C2-Benzanthrene/chrysenes (ug/g)	337	256	0.00039	0.0657	-0.16	0.17
C2-Dibenzothiophenes (ug/g)	130	60	0.00015	0.034	-0.02	0.87
C2-Fluoranthrenes/pyrenes (ug/g)	334	228	0.0003	0.083	-0.11	0.25
C2-Fluorenes (ug/g)	339	276	0.0004	0.0438	-0.13	0.33
C2-Naphthalenes (ug/g)	338	236	0.00022	0.0375	-0.06	0.55
C2-Naphthobenzothiophenes (ug/g)	66	59	0.0014	0.013	-0.45	0.31
C2-Phenanthrenes/anthracenes (ug/g)	340	225	0.00052	0.281	-0.15	0.10
C3-Benzanthrene/chrysenes (ug/g)	337	285	0.0011	0.053	-0.15	0.28
C3-Dibenzothiophenes (ug/g)	130	69	0.00024	0.02	-0.10	0.43
C3-Fluoranthrenes/pyrenes (ug/g)	334	251	0.00054	0.081	-0.10	0.36
C3-Fluorenes (ug/g)	339	280	0.00107	0.0716	-0.29	0.03
C3-Naphthalenes (ug/g)	338	254	0.0003	0.0231	-0.15	0.17
C3-Naphthobenzothiophenes (ug/g)	66	60	0.00085	0.0074	-0.26	0.62
C3-Phenanthrenes/anthracenes (ug/g)	340	246	0.00035	0.187	-0.19	0.07
C4-Benzanthrene/chrysenes (ug/g)	330	302	0.00037	0.05	0.00	0.99
C4-Dibenzothiophenes (ug/g)	64	26	0.00059	0.00742	0.08	0.65
C4-Naphthalenes (ug/g)	338	277	0.00035	0.0341	-0.19	0.15
C4-Phenanthrenes/anthracenes (ug/g)	336	256	0.00052	0.132	-0.30	0.01
Caprolactam (ug/g)	94	70	0.0054	0.043	-0.39	0.06
Carbon Disulfide (ug/g)	293	180	0.00047	0.079	-0.29	0.00
Cholestane (ug/g)	130	48	0.0002	0.027	0.17	0.12
Chrysene (ug/g)	424	271	0.00022	0.972	0.08	0.32
D1-Diasterane-27[S] (ug/g)	64	22	0.00045	0.01049	-0.10	0.54
D2-Diasterane-27[R] (ug/g)	64	29	0.00038	0.00635	0.03	0.87
D3a-Diasterane-28[S] (ug/g)	64	25	0.00034	0.00729	-0.08	0.63
D3-Diasterane-28[S] (ug/g)	64	26	0.00038	0.00559	-0.07	0.66
D4a-Diasterane-28[R] (ug/g)	64	24	0.0003	0.00692	-0.22	0.17
D4-Diasterane-28[R] (ug/g)	64	42	0.00027	0.00293	-0.02	0.94
D5-Diasterane-29[S] (ug/g)	64	14	0.00027	0.01112	0.09	0.53
D6-Diasterane-29[R] (ug/g)	64	17	0.00023	0.01064	0.05	0.74
Dibenz(a,h)anthracene (ug/g)	424	358	0.00005	0.109	-0.07	0.59
Dibenzofuran (ug/g)	358	295	0.00004	0.014	0.22	0.08
Dibenzothiophene (ug/g)	130	62	0.00002	0.0047	0.10	0.41
Diethyl phthalate (ug/g)	294	290	0.0042	0.0088	0.40	0.60
Di-n-butyl phthalate (ug/g)	294	279	0.0032	0.091	-0.46	0.09

Table A-5.

Parameter	Sediment Amphipod, 10-days Survival					
	N	ND	Detect Range		Corr	Pvalue
Di-n-octyl phthalate (ug/g)	294	285	0.0039	0.41	0.34	0.37
Fluoranthene (ug/g)	424	236	0.0002	1.05	0.11	0.12
Fluorene (ug/g)	424	348	0.00003	0.0505	0.13	0.27
Indeno(1,2,3-cd)pyrene (ug/g)	424	313	0.00019	0.424	0.02	0.80
m,p-Xylenes (ug/g)	94	91	0.0051	0.021	-0.50	0.67
Methyl ethyl ketone (ug/g)	294	275	0.006	0.15	-0.19	0.44
Methylene Chloride (ug/g)	294	290	0.0022	0.0125	0.20	0.80
Naphthalene (ug/g)	423	326	0.00053	0.032	-0.03	0.79
Naphthobenzothiophene (ug/g)	66	61	0.0015	0.02	0.00	1.00
n-Decane (C10) (ug/g)	130	121	0.00099	0.024	-0.22	0.57
n-Dodcosane (C22) (ug/g)	130	73	0.00377	81.29	0.05	0.73
n-Dodecane (C12) (ug/g)	130	122	0.00249	0.046	0.00	1.00
n-Dotriacontane (C32) (ug/g)	130	81	0.01169	1031.54	0.18	0.22
n-Eicosane (C20) (ug/g)	130	109	0.00913	30.39	0.31	0.17
n-Heneicosane (C21) (ug/g)	130	77	0.00726	98.14	0.06	0.69
n-Hentriacontane (C31) (ug/g)	130	85	0.01267	2.7	-0.08	0.62
n-Heptacosane (C27) (ug/g)	130	94	0.014	801.1	0.22	0.20
n-Heptadecane (C17) (ug/g)	130	88	0.00565	16.96	0.02	0.92
n-Heptatriacontane (C37) (ug/g)	129	87	0.00266	0.22	-0.27	0.09
n-Hexacosane (C26) (ug/g)	130	102	0.015	1.1	0.32	0.10
n-Hexadecane (C16) (ug/g)	130	82	0.00219	11.32	-0.03	0.84
n-Hexatriacontane (C36) (ug/g)	130	83	0.00685	358.43	-0.05	0.72
n-Nonacosane (C29) (ug/g)	130	86	0.012	870.52	0.04	0.79
n-Nonadecane (C19) (ug/g)	130	112	0.00417	28	-0.14	0.58
n-Nonatriacontane (C39) (ug/g)	130	98	0.00235	28.59	-0.15	0.41
n-Octacosane (C28) (ug/g)	130	101	0.013	0.78	0.61	0.00
n-Octadecane (C18) (ug/g)	130	103	0.00579	17.73	0.04	0.83
n-Octatriacontane (C38) (ug/g)	130	83	0.00189	0.28	-0.29	0.05
Nonane (ug/g)	130	123	0.00244	0.016	-0.63	0.13
Norpristane (1650) (ug/g)	130	112	0.0015	0.66	-0.18	0.47
n-Pentacosane (C25) (ug/g)	130	100	0.01083	2.5	0.25	0.18
n-Pentadecane (C15) (ug/g)	130	96	0.00671	21.88	-0.16	0.37
n-Pentatriacontane (C35) (ug/g)	130	85	0.00594	461.48	-0.01	0.96
n-Tetracontane (C40) (ug/g)	130	79	0.00168	22.26	-0.06	0.65
n-Tetracosane (C24) (ug/g)	130	83	0.01619	136.02	0.39	0.01
n-Tetradecane (C14) (ug/g)	130	96	0.00137	6	-0.12	0.51
n-Tetratriacontane (C34) (ug/g)	130	90	0.01066	385.56	0.09	0.59
n-Tricontane (C30) (ug/g)	130	105	0.02667	1.2	0.23	0.27
n-Tricosane (C23) (ug/g)	130	74	0.00357	202.81	0.24	0.08
n-Tridecane (C13) (ug/g)	130	115	0.00109	0.19	-0.31	0.26
n-Tritriacontane (C33) (ug/g)	130	79	0.00704	1095.75	0.19	0.18
n-Undecane (C11) (ug/g)	130	124	0.00285	0.042	0.03	0.95
Oil and Grease, HEM (ug/g)	199	108	94.4	11800	0.18	0.08
Perylene (ug/g)	339	189	0.00088	0.25	0.16	0.05
Phenanthrene (ug/g)	424	262	0.00012	0.522	0.02	0.81
Phenol (ug/g)	294	282	0.0044	2.76	0.13	0.68

Table A-5.

Parameter	Sediment Amphipod, 10-days Survival					
	N	ND	Detect Range		Corr	Pvalue
Phytane (ug/g)	130	98	0.00317	12.27	-0.15	0.41
Pristane (ug/g)	130	94	0.00377	14.75	-0.16	0.35
Pyrene (ug/g)	424	244	0.00025	2.45	0.13	0.09
S10-Methyldiacholestane (ug/g)	130	78	0.00013	0.015	0.10	0.48
S11-Methyldiacholestane (ug/g)	130	71	0.0002	0.00846	0.20	0.13
S12-Cholestane (ug/g)	130	48	0.00018	0.03054	0.08	0.45
S14-CHOLESTANE (20R) (ug/g)	130	62	0.00011	0.015	0.08	0.54
S15-Cholestane (20S) (ug/g)	130	64	0.000094	0.01288	0.12	0.33
S18-Ethyldiacholestane (ug/g)	130	73	0.000085	0.00837	0.30	0.02
S19-Ethyldiacholestane (ug/g)	130	110	0.000094	0.0018	-0.14	0.55
S1-Pregnane (ug/g)	64	39	0.00122	0.00971	-0.09	0.67
S20-Methylcholestane (ug/g)	130	62	0.000079	0.01015	0.21	0.09
S22-Methylcholestane(20R) (ug/g)	130	57	0.00011	0.01287	0.20	0.09
S23-Methylcholestane(20S) (ug/g)	130	56	0.000095	0.01535	0.18	0.13
S24-Methylcholestane (ug/g)	130	58	0.000087	0.00765	0.16	0.17
S25-Ethylcholestane (ug/g)	130	54	0.0001	0.00983	0.27	0.02
S26-Ethylcholestane(20R) (ug/g)	130	44	0.00012	0.01798	0.22	0.04
S27-Ethylcholestane(20S) (ug/g)	130	46	0.0001	0.01618	0.21	0.05
S28-Ethylcholestane (ug/g)	130	49	0.000097	0.01135	0.22	0.05
S29-C30cholestane(R) (ug/g)	64	57	0.00025	0.00409	0.43	0.34
S30-C30cholestane(S) (ug/g)	64	38	0.00024	0.00333	-0.15	0.47
S4-Diacholestane (ug/g)	130	57	0.00012	0.02	0.18	0.14
S5-Diacholestane (ug/g)	130	72	0.000089	0.01129	0.24	0.07
S6-Diacholestane (ug/g)	130	96	0.00012	0.0056	0.12	0.52
S7-Diacholestane (ug/g)	130	69	0.000079	0.01029	0.13	0.31
S8-Methyldiacholestane (ug/g)	130	67	0.000092	0.01117	0.15	0.25
Sa-C21Diasterane (ug/g)	64	41	0.0009	0.00677	0.06	0.80
Sb-C21Sterane (ug/g)	64	33	0.00086	0.01007	-0.17	0.37
Sc-C22Diasterane (ug/g)	64	60	0.00083	0.00179	0.40	0.60
Sd-C22Sterane (ug/g)	64	52	0.00103	0.00434	0.51	0.09
T0-C19Diterpane (ug/g)	64	44	0.00014	0.00079	-0.58	0.01
T10-C29Tricyclitriterpane(R) (ug/g)	130	117	0.00012	0.00181	0.29	0.33
T11-Trisnorhopane(TS) (ug/g)	130	73	0.000084	0.00532	0.29	0.03
T12-Trisnorhopane(TM) (ug/g)	130	57	0.00008	0.00746	0.42	0.00
T13a-29,30-Bisnorhopane (ug/g)	130	93	0.00026	0.00459	0.04	0.81
T14a-C28,C30Bisnorhopane (ug/g)	130	117	0.00042	0.0022	0.20	0.50
T14-Bisnorhopane (ug/g)	130	123	0.00081	0.00264	0.14	0.76
T15-C29-Norhopane (ug/g)	130	33	0.000092	0.01998	0.41	0.00
T16-Norneohopane (ug/g)	130	68	0.000099	0.0071	0.32	0.01
T17-C30-Normoretane (ug/g)	130	70	0.000085	0.01453	0.41	0.00
T18-C30-Oleanane (ug/g)	130	122	0.00069	0.00225	0.02	0.95
T19-C30 Hopane (ug/g)	130	24	0.00012	0.03419	0.28	0.00
T1-C20Diterpane (ug/g)	64	25	0.00013	0.00224	-0.05	0.78
T20-Moretane (ug/g)	130	52	0.0001	0.01584	0.43	0.00
T21-C31-Homohopane(S) (ug/g)	130	48	0.00012	0.01601	0.33	0.00
T22a-Gammacerane (ug/g)	130	115	0.00033	0.00176	0.59	0.02

Table A-5.

Parameter	Sediment Amphipod, 10-days Survival					
	N	ND	Detect Range		Corr	Pvalue
	T22-C31-Homohopane(R) (ug/g)	130	34	0.0001	0.02224	0.36
T23-Homohopane (ug/g)	66	51	0.000089	0.0028	-0.21	0.45
T24-Homomoretane (ug/g)	130	115	0.0001	0.0053	-0.16	0.57
T25-Diploptene (ug/g)	130	99	0.00026	0.04016	0.53	0.00
T26-C32-Bishomohopane(S) (ug/g)	130	50	0.00013	0.01401	0.45	0.00
T27-C32-Bishomohopane(R) (ug/g)	130	70	0.000088	0.01573	0.42	0.00
T28-Bishomomoretane (ug/g)	130	76	0.00015	0.01533	0.23	0.09
T29-Homohopane (ug/g)	130	122	0.00065	0.00316	0.36	0.38
T2-C21Diterpane (ug/g)	64	31	0.00041	0.00317	0.05	0.76
T30-C33-Trishomohopane(S) (ug/g)	130	53	0.000093	0.0144	0.34	0.00
T31-C33-Trishomohopane(R) (ug/g)	130	88	0.00014	0.00529	0.19	0.23
T32-Tetrakishomohopane(S) (ug/g)	130	90	0.00011	0.01949	0.51	0.00
T33-Tetrakishomohopane(R) (ug/g)	130	114	0.0001	0.00395	0.12	0.65
T34-Pentakishomohopane(S) (ug/g)	130	114	0.0001	0.002	-0.05	0.85
T35-Pentakishomohopane(R) (ug/g)	130	113	0.000083	0.00459	0.20	0.44
T3-C22Diterpane (ug/g)	64	56	0.00057	0.00137	-0.04	0.93
T4-C23Diterpane (ug/g)	130	73	0.000089	0.00704	0.07	0.58
T5-C24Diterpane (ug/g)	130	82	0.0001	0.00287	0.18	0.22
T6a-C24Tetracyclic Terpane (ug/g)	130	107	0.00016	0.00214	0.29	0.18
T6b-C26Tricyclic[S] (ug/g)	130	103	0.00009	0.00636	0.22	0.27
T6-C25Diterpane (ug/g)	130	82	0.000076	0.0033	0.33	0.02
T6c-C26Tricyclic[R] (ug/g)	130	106	0.0001	0.00192	0.08	0.73
T7-C28Tricyclictriterpane[S] (ug/g)	130	115	0.00017	0.0068	0.40	0.14
T8-C28Tricyclictriterpane[R] (ug/g)	130	110	0.0001	0.00167	0.17	0.48
T9-C29Tricyclictriterpane(S) (ug/g)	130	102	0.000084	0.00179	0.33	0.09
TIC (ug/g)	76	55	321	232000	-0.01	0.96
Toluene (ug/g)	360	340	0.00049	0.0048	-0.21	0.38
Xylenes, Total (ug/g)	350	347	0.0051	0.021	-0.50	0.67
Aromatics, Total (ug/g)	66	33	0.00093	1	-0.02	0.91
SHC, Total (ug/g)	130	14	0.014	7030.13	0.40	0.00
SHC, Total Resolved (C9-C40) (ug/g)	66	63	6.5	67	0.50	0.67
Total PAH (ug/g)	64	0	0.00836	0.51672	0.12	0.33
TPH (Diesel Range) (C10-C28) (ug/g)	266	175	3.75	420	-0.14	0.20
TPH (Diesel Range) (ug/g)	158	45	0.14678	45384.29	0.32	0.00
TPH (Gasoline Range) (C6-10) (ug/g)	294	242	0.02	1.78	-0.11	0.46
TPH (Oil Range) (>C28-C40) (ug/g)	94	5	0.78	39	-0.05	0.65
TPH (Oil Range) (C28-C35) (ug/g)	200	94	3	514	-0.02	0.86
TPH, Total (C9-C40) (ug/g)	66	59	14	840	-0.06	0.89
TPH, Total (ug/g)	64	8	0.04712	117372.75	0.33	0.01

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-6.

Parameter	Sediment Amphipod, 96-hours Growth					
	N	ND	Detect Range		Corr	Pvalue
0.001 mm (% passing)	71	4	0.5	55.5	-0.17	0.17
0.002 mm (% passing)	71	1	0.5	62.5	-0.18	0.13
0.005 mm (% passing)	71	1	1	75.5	-0.20	0.09
0.02 mm (% passing)	71	0	1	93	-0.19	0.11
0.05 mm (% passing)	71	0	3	98	-0.21	0.08
0.064 mm (% passing)	71	0	5	99	-0.19	0.11
0.075 mm (% passing)	71	0	8.3	99.2	-0.16	0.20
0.15 mm (% passing)	71	0	34.3	99.7	-0.15	0.20
0.3 mm (% passing)	71	0	83.7	99.8	-0.09	0.47
0.6 mm (% passing)	71	0	90.5	99.9	-0.04	0.77
1.18 mm (% passing)	71	0	93.4	99.9	-0.01	0.96
19 mm (% passing)	71	0	100	100	NA	NA
2.36 mm (% passing)	71	0	95.7	100	0.17	0.17
3.35 mm (% passing)	71	0	96.6	100	0.11	0.38
37.5 mm (% passing)	71	0	100	100	NA	NA
4.75 mm (% passing)	71	0	96.9	100	0.07	0.57
75 mm (% passing)	71	0	100	100	NA	NA
Clay (%)	71	1	1	75.5	-0.20	0.09
Gravel (%)	71	64	0.5	3.1	0.04	0.94
Sand (%)	71	0	0.7	91.7	0.17	0.15
Silt (%)	71	0	7.7	67.6	-0.02	0.88
Moisture (%)	66	0	18.7	76.7	-0.10	0.43
Total Organic Carbon (ug/g)	66	0	1340	48900	-0.14	0.25
15a-methyl-17a(H)-27-Norhopane (ug/g)	73	43	0.00062	0.00391	0.37	0.04
2,6,10 Trimethyldodecane (1380) (ug/g)	73	69	0.00081	0.01263	-0.74	0.26
2,6,10 Trimethyltridecane (1470) (ug/g)	73	63	0.00197	0.0119	0.28	0.43
A1-C20-TAS (ug/g)	73	42	0.00012	0.00155	-0.07	0.72
A2-C21-TAS (ug/g)	73	32	0.00013	0.00175	-0.01	0.95
A3-C26 TAS(20S) (ug/g)	73	3	0.00011	0.00344	0.27	0.03
A4-C26/C27-TAS (ug/g)	73	1	0.00007	0.00547	0.01	0.93
A5-C27-TAS(20R) (ug/g)	73	4	0.0001	0.00366	0.00	0.98
A6-TAS(20S) (ug/g)	73	5	0.00007	0.00521	0.01	0.96
A7-TAS(20R) (ug/g)	73	8	0.00009	0.00359	0.03	0.81
Acenaphthene (ug/g)	73	6	0.00004	0.00124	-0.03	0.81
Acenaphthylene (ug/g)	73	4	0.00003	0.00258	0.05	0.70
Anthracene (ug/g)	73	1	0.00003	0.00424	-0.08	0.53
Benz(a)anthracene (ug/g)	73	0	0.00011	0.01458	-0.07	0.57
Benzo(a)pyrene (ug/g)	73	2	0.00019	0.01768	-0.06	0.60
Benzo(b)fluoranthene (ug/g)	73	0	0.00027	0.02004	-0.07	0.56
Benzo(e)pyrene (ug/g)	73	6	0.00026	0.0165	-0.01	0.95
Benzo(g,h,i)perylene (ug/g)	73	1	0.00022	0.01635	-0.05	0.67
Benzo(k)fluoranthene (ug/g)	73	3	0.00022	0.01906	-0.05	0.65
Biphenyl (ug/g)	73	1	0.00006	0.00188	0.01	0.96
C1-Benzanthrene/chrysenes (ug/g)	73	0	0.00029	0.01606	0.01	0.96
C1-Dibenzothiophenes (ug/g)	73	13	0.00007	0.01286	-0.06	0.63

Table A-6.

Parameter	Sediment					
	Amphipod, 96-hours					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
C1-Fluoranthrenes/pyrenes (ug/g)	73	0	0.00028	0.01612	-0.08	0.49
C1-Fluorenes (ug/g)	73	9	0.00011	0.00258	-0.01	0.91
C1-Naphthalenes (ug/g)	73	0	0.00014	0.00873	-0.03	0.79
C1-Phenanthrenes/anthracenes (ug/g)	73	4	0.00032	0.01594	-0.08	0.49
C2-Benzanthrene/chrysenes (ug/g)	73	8	0.00039	0.01429	-0.02	0.88
C2-Dibenzothiophenes (ug/g)	73	6	0.00015	0.00628	-0.01	0.96
C2-Fluoranthrenes/pyrenes (ug/g)	73	2	0.0003	0.01416	-0.06	0.63
C2-Fluorenes (ug/g)	73	20	0.0004	0.00588	0.10	0.49
C2-Naphthalenes (ug/g)	73	2	0.00022	0.01381	0.10	0.42
C2-Phenanthrenes/anthracenes (ug/g)	73	3	0.00052	0.02362	0.05	0.69
C3-Benzanthrene/chrysenes (ug/g)	73	29	0.00119	0.01124	0.05	0.74
C3-Dibenzothiophenes (ug/g)	73	11	0.00024	0.00942	0.04	0.78
C3-Fluoranthrenes/pyrenes (ug/g)	73	12	0.00054	0.01044	0.01	0.97
C3-Fluorenes (ug/g)	73	30	0.00107	0.00829	0.41	0.01
C3-Naphthalenes (ug/g)	73	6	0.0003	0.01002	-0.08	0.54
C3-Phenanthrenes/anthracenes (ug/g)	73	3	0.00035	0.02263	-0.01	0.94
C4-Benzanthrene/chrysenes (ug/g)	73	49	0.00037	0.0087	0.12	0.57
C4-Dibenzothiophenes (ug/g)	73	26	0.00059	0.00742	0.02	0.90
C4-Naphthalenes (ug/g)	73	21	0.00035	0.00782	0.11	0.46
C4-Phenanthrenes/anthracenes (ug/g)	73	16	0.00052	0.0115	0.06	0.67
Cholestane (ug/g)	73	9	0.0005	0.02622	-0.02	0.85
Chrysene (ug/g)	73	0	0.00022	0.0242	-0.01	0.95
D1-Diasterane-27[S] (ug/g)	73	22	0.00045	0.01049	-0.08	0.57
D2-Diasterane-27[R] (ug/g)	73	30	0.00038	0.00635	-0.14	0.38
D3a-Diasterane-28[S] (ug/g)	73	25	0.00034	0.00729	-0.03	0.83
D3-Diasterane-28[S] (ug/g)	73	26	0.00038	0.00559	0.00	0.98
D4a-Diasterane-28[R] (ug/g)	73	24	0.0003	0.00692	0.10	0.49
D4-Diasterane-28[R] (ug/g)	73	47	0.00027	0.00293	-0.03	0.90
D5-Diasterane-29[S] (ug/g)	73	14	0.00027	0.01112	0.05	0.69
D6-Diasterane-29[R] (ug/g)	73	17	0.00023	0.01064	-0.03	0.82
Dibenz(a,h)anthracene (ug/g)	73	17	0.00005	0.00365	0.00	0.98
Dibenzofuran (ug/g)	73	2	0.00004	0.00264	0.00	0.98
Dibenzothiophene (ug/g)	73	2	0.00002	0.00188	-0.01	0.91
Fluoranthene (ug/g)	73	0	0.0002	0.02902	-0.07	0.56
Fluorene (ug/g)	73	3	0.00003	0.0023	-0.01	0.96
Indeno(1,2,3-cd)pyrene (ug/g)	73	0	0.00019	0.01676	-0.07	0.58
Naphthalene (ug/g)	72	23	0.00053	0.00829	0.13	0.38
n-Decane (C10) (ug/g)	73	69	0.00099	0.0054	0.26	0.74
n-Dodcosane (C22) (ug/g)	73	15	0.00377	81.29	-0.18	0.18
n-Dotriacontane (C32) (ug/g)	73	30	0.01169	1031.54	-0.04	0.78
n-Eicosane (C20) (ug/g)	73	59	0.00913	30.39	-0.35	0.21
n-Heneicosane (C21) (ug/g)	73	23	0.00726	98.14	-0.10	0.49
n-Hentriacontane (C31) (ug/g)	73	40	0.01267	0.2524	-0.18	0.32
n-Heptacosane (C27) (ug/g)	73	49	0.03692	801.1	-0.23	0.28
n-Heptadecane (C17) (ug/g)	73	45	0.00565	16.96	-0.06	0.75

Table A-6.

Parameter	Sediment					
	Amphipod, 96-hours					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
n-Heptatriacontane (C37) (ug/g)	73	40	0.00266	0.06455	-0.16	0.38
n-Hexacosane (C26) (ug/g)	73	52	0.05477	0.69998	0.44	0.05
n-Hexadecane (C16) (ug/g)	73	45	0.00219	11.32	-0.15	0.44
n-Hexatriacontane (C36) (ug/g)	73	30	0.00685	358.43	-0.41	0.01
n-Nonacosane (C29) (ug/g)	73	49	0.03758	870.52	-0.19	0.37
n-Nonadecane (C19) (ug/g)	73	56	0.00417	15.31	-0.46	0.06
n-Nonatriacontane (C39) (ug/g)	73	41	0.00235	28.59	0.05	0.78
n-Octacosane (C28) (ug/g)	73	56	0.07247	0.17825	0.12	0.63
n-Octadecane (C18) (ug/g)	73	51	0.00579	17.73	-0.25	0.27
n-Octatriacontane (C38) (ug/g)	73	39	0.00189	0.07612	-0.02	0.89
Nonane (ug/g)	73	69	0.00244	0.00919	-0.77	0.23
Norpristane (1650) (ug/g)	73	59	0.0015	0.0099	0.27	0.36
n-Pentacosane (C25) (ug/g)	73	51	0.01083	0.13357	-0.33	0.13
n-Pentadecane (C15) (ug/g)	73	46	0.00671	21.88	-0.08	0.69
n-Pentatriacontane (C35) (ug/g)	73	34	0.00594	461.48	-0.08	0.65
n-Tetracontane (C40) (ug/g)	73	39	0.00168	22.26	-0.14	0.43
n-Tetracosane (C24) (ug/g)	73	27	0.01619	136.02	-0.28	0.06
n-Tetradecane (C14) (ug/g)	73	60	0.00137	0.0126	0.03	0.91
n-Tetratriacontane (C34) (ug/g)	73	33	0.01066	385.56	-0.18	0.26
n-Tricontane (C30) (ug/g)	73	53	0.02667	0.16387	-0.26	0.27
n-Tricosane (C23) (ug/g)	73	16	0.00357	202.81	-0.10	0.45
n-Tridecane (C13) (ug/g)	73	70	0.00109	0.00376	-0.87	0.33
n-Tritriacontane (C33) (ug/g)	73	34	0.00704	1095.75	-0.32	0.05
Perylene (ug/g)	73	0	0.00401	0.23779	-0.19	0.10
Phenanthrene (ug/g)	73	0	0.00012	0.01542	-0.04	0.72
Phytane (ug/g)	73	51	0.00317	12.27	-0.18	0.42
Pristane (ug/g)	73	45	0.00377	14.75	-0.12	0.55
Pyrene (ug/g)	73	0	0.00025	0.02797	-0.07	0.57
S10-Methyldiacholestane (ug/g)	73	35	0.00064	0.00765	0.19	0.25
S11-Methyldiacholestane (ug/g)	73	25	0.00048	0.00846	0.05	0.75
S12-Cholestane (ug/g)	73	8	0.00057	0.03054	-0.02	0.88
S14-CHOLESTANE (20R) (ug/g)	73	16	0.00023	0.01216	0.01	0.97
S15-Cholestane (20S) (ug/g)	73	16	0.00029	0.01288	0.03	0.83
S18-Ethyldiacholestane (ug/g)	73	26	0.00039	0.00837	-0.07	0.65
S19-Ethyldiacholestane (ug/g)	73	66	0.00045	0.00112	0.40	0.38
S1-Pregnane (ug/g)	73	41	0.00122	0.00971	0.27	0.13
S20-Methylcholestane (ug/g)	73	13	0.00066	0.01015	-0.01	0.92
S22-Methylcholestane(20R) (ug/g)	73	15	0.00039	0.01287	0.00	0.97
S23-Methylcholestane(20S) (ug/g)	73	15	0.00034	0.01535	-0.05	0.70
S24-Methylcholestane (ug/g)	73	13	0.00035	0.00765	-0.02	0.88
S25-Ethylcholestane (ug/g)	73	14	0.00026	0.00983	0.07	0.60
S26-Ethylcholestane(20R) (ug/g)	73	5	0.00027	0.01798	-0.01	0.91
S27-Ethylcholestane(20S) (ug/g)	73	7	0.00022	0.01618	-0.01	0.91
S28-Ethylcholestane (ug/g)	73	13	0.0004	0.01135	0.00	0.98
S29-C30cholestane(R) (ug/g)	73	65	0.00025	0.00409	-0.05	0.91

Table A-6.

Parameter	Sediment					
	Amphipod, 96-hours					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
S30-C30Cholestane(S) (ug/g)	73	46	0.00024	0.00333	0.05	0.82
S4-Diacholestane (ug/g)	73	19	0.00086	0.01999	-0.01	0.93
S5-Diacholestane (ug/g)	73	27	0.00071	0.01129	-0.05	0.76
S6-Diacholestane (ug/g)	73	52	0.00093	0.00432	0.25	0.28
S7-Diacholestane (ug/g)	73	24	0.00057	0.01029	0.00	0.98
S8-Methyldiacholestane (ug/g)	73	23	0.00061	0.01117	-0.03	0.85
Sa-C21Diasterane (ug/g)	73	44	0.0009	0.00677	0.20	0.29
Sb-C21Sterane (ug/g)	73	33	0.00086	0.01007	0.14	0.37
Sc-C22Diasterane (ug/g)	73	69	0.00083	0.00179	0.11	0.89
Sd-C22Sterane (ug/g)	73	60	0.00103	0.00434	0.59	0.03
T0-C19Diterpane (ug/g)	73	53	0.00014	0.00079	-0.39	0.09
T10-C29Tricyclitriterpane(R) (ug/g)	73	68	0.00092	0.00181	0.67	0.22
T11-Trisnorhopane(TS) (ug/g)	73	25	0.00052	0.00532	0.14	0.36
T12-Trisnorhopane(TM) (ug/g)	73	12	0.00036	0.00746	-0.04	0.74
T13a-29,30-Bisnorhopane (ug/g)	73	37	0.00037	0.00459	0.18	0.28
T14a-C28,C30Bisnorhopane (ug/g)	73	61	0.00054	0.0022	-0.30	0.34
T14-Bisnorhopane (ug/g)	73	65	0.00086	0.00264	0.70	0.06
T15-C29-Norhopane (ug/g)	73	4	0.00059	0.01998	-0.05	0.71
T16-Norneohopane (ug/g)	73	23	0.00063	0.0071	0.19	0.19
T17-C30-Normoretane (ug/g)	73	11	0.0006	0.01453	-0.08	0.54
T18-C30-Oleanane (ug/g)	73	64	0.00069	0.00225	0.12	0.77
T19-C30 Hopane (ug/g)	73	0	0.00042	0.03419	-0.03	0.79
T1-C20Diterpane (ug/g)	73	25	0.00013	0.00224	0.12	0.43
T20-Moretane (ug/g)	73	5	0.00045	0.01584	-0.18	0.15
T21-C31-Homohopane(S) (ug/g)	73	15	0.00063	0.01601	0.06	0.67
T22a-Gammacerane (ug/g)	73	55	0.00066	0.00176	-0.26	0.29
T22-C31-Homohopane(R) (ug/g)	73	1	0.00051	0.02224	-0.16	0.17
T25-Diploptene (ug/g)	73	37	0.0012	0.04016	0.22	0.20
T26-C32-Bishomohopane(S) (ug/g)	73	14	0.00072	0.01401	0.00	0.99
T27-C32-Bishomohopane(R) (ug/g)	73	25	0.00056	0.01573	-0.01	0.94
T28-Bishomomoretane (ug/g)	73	14	0.00054	0.01533	-0.17	0.21
T29-Homohopane (ug/g)	73	68	0.00071	0.00316	-0.36	0.55
T2-C21Diterpane (ug/g)	73	35	0.00041	0.00317	0.19	0.25
T30-C33-Trishomohopane(S) (ug/g)	73	8	0.00051	0.0144	-0.04	0.77
T31-C33-Trishomohopane(R) (ug/g)	73	36	0.00087	0.00529	0.38	0.02
T32-Tetrakishomohopane(S) (ug/g)	73	37	0.00096	0.01949	0.18	0.30
T33-Tetrakishomohopane(R) (ug/g)	73	68	0.00054	0.00395	-0.10	0.87
T34-Pentakishomohopane(S) (ug/g)	73	67	0.00068	0.00199	0.49	0.32
T35-Pentakishomohopane(R) (ug/g)	73	65	0.0014	0.00459	0.57	0.14
T3-C22Diterpane (ug/g)	73	65	0.00057	0.00137	-0.02	0.95
T4-C23Diterpane (ug/g)	73	26	0.00053	0.00704	0.46	0.00
T5-C24Diterpane (ug/g)	73	32	0.00039	0.00287	0.25	0.11
T6a-C24Tetracyclic Terpane (ug/g)	73	51	0.00057	0.00214	0.14	0.52
T6b-C26Tricyclic[S] (ug/g)	73	55	0.00047	0.00636	0.12	0.64
T6-C25Diterpane (ug/g)	73	34	0.00066	0.0033	0.00	0.98

Table A-6.

Parameter	Sediment					
	Amphipod, 96-hours					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
T6c-C26Tricyclic[R] (ug/g)	73	62	0.00066	0.00192	-0.35	0.30
T7-C28Tricyclictriterpane[S] (ug/g)	73	68	0.00068	0.00141	-0.10	0.87
T8-C28Tricyclictriterpane[R] (ug/g)	73	63	0.00054	0.00167	0.34	0.33
T9-C29Tricyclictriterpane(S) (ug/g)	73	65	0.00071	0.00179	-0.18	0.68
SHC, Total (ug/g)	73	0	0.14258	7030.13	-0.12	0.32
Total PAH (ug/g)	73	0	0.00836	0.51672	-0.08	0.51
TPH (Diesel Range) (ug/g)	73	13	0.14678	45384.29	-0.07	0.62
TPH, Total (ug/g)	73	8	0.04712	117372.75	-0.13	0.32

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-7.

Parameter	Sediment					
	Amphipod, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
0.001 mm (% passing)	71	4	0.5	55.5	0.00	0.97
0.002 mm (% passing)	71	1	0.5	62.5	0.10	0.43
0.005 mm (% passing)	71	1	1	75.5	0.12	0.33
0.02 mm (% passing)	71	0	1	93	0.14	0.23
0.05 mm (% passing)	71	0	3	98	0.16	0.20
0.064 mm (% passing)	71	0	5	99	0.17	0.16
0.075 mm (% passing)	71	0	8.3	99.2	0.14	0.25
0.15 mm (% passing)	71	0	34.3	99.7	0.00	1.00
0.3 mm (% passing)	71	0	83.7	99.8	-0.11	0.35
0.6 mm (% passing)	71	0	90.5	99.9	-0.06	0.62
1.18 mm (% passing)	71	0	93.4	99.9	-0.15	0.21
19 mm (% passing)	71	0	100	100	NA	NA
2.36 mm (% passing)	71	0	95.7	100	-0.23	0.06
3.35 mm (% passing)	71	0	96.6	100	-0.30	0.01
37.5 mm (% passing)	71	0	100	100	NA	NA
4.75 mm (% passing)	71	0	96.9	100	-0.30	0.01
75 mm (% passing)	71	0	100	100	NA	NA
Clay (%)	71	1	1	75.5	0.12	0.33
Gravel (%)	71	64	0.5	3.1	-0.50	0.25
Sand (%)	71	0	0.7	91.7	-0.15	0.20
Silt (%)	71	0	7.7	67.6	0.11	0.38
Moisture (%)	66	0	18.7	76.7	0.09	0.47
Total Organic Carbon (ug/g)	66	0	1340	48900	0.21	0.09
15a-methyl-17a(H)-27-Norhopane (ug/g)	73	43	0.00062	0.00391	-0.04	0.84
2,6,10 Trimethyldodecane (1380) (ug/g)	73	69	0.00081	0.01263	0.32	0.68
2,6,10 Trimethyltridecane (1470) (ug/g)	73	63	0.00197	0.0119	0.22	0.55
A1-C20-TAS (ug/g)	73	42	0.00012	0.00155	0.02	0.90
A2-C21-TAS (ug/g)	73	32	0.00013	0.00175	-0.03	0.83
A3-C26 TAS(20S) (ug/g)	73	3	0.00011	0.00344	0.00	0.99
A4-C26/C27-TAS (ug/g)	73	1	0.00007	0.00547	0.30	0.01
A5-C27-TAS(20R) (ug/g)	73	4	0.0001	0.00366	0.18	0.13
A6-TAS(20S) (ug/g)	73	5	0.00007	0.00521	0.21	0.09
A7-TAS(20R) (ug/g)	73	8	0.00009	0.00359	0.11	0.40
Acenaphthene (ug/g)	73	6	0.00004	0.00124	0.22	0.08
Acenaphthylene (ug/g)	73	4	0.00003	0.00258	0.24	0.05
Anthracene (ug/g)	73	1	0.00003	0.00424	0.29	0.01
Benz(a)anthracene (ug/g)	73	0	0.00011	0.01458	0.32	0.01
Benzo(a)pyrene (ug/g)	73	2	0.00019	0.01768	0.36	0.00
Benzo(b)fluoranthene (ug/g)	73	0	0.00027	0.02004	0.31	0.01
Benzo(e)pyrene (ug/g)	73	6	0.00026	0.0165	0.32	0.01
Benzo(g,h,i)perylene (ug/g)	73	1	0.00022	0.01635	0.25	0.04
Benzo(k)fluoranthene (ug/g)	73	3	0.00022	0.01906	0.22	0.07
Biphenyl (ug/g)	73	1	0.00006	0.00188	0.18	0.13
C1-Benzanthrene/chrysenes (ug/g)	73	0	0.00029	0.01606	0.28	0.02
C1-Dibenzothiophenes (ug/g)	73	13	0.00007	0.01286	0.14	0.29

Table A-7.

Parameter	Sediment Amphipod, 96-hours Survival					
	N	ND	Detect Range		Corr	Pvalue
C1-Fluoranthrenes/pyrenes (ug/g)	73	0	0.00028	0.01612	0.31	0.01
C1-Fluorenes (ug/g)	73	9	0.00011	0.00258	0.11	0.37
C1-Naphthalenes (ug/g)	73	0	0.00014	0.00873	0.21	0.08
C1-Phenanthrenes/anthracenes (ug/g)	73	4	0.00032	0.01594	0.21	0.08
C2-Benzanthrene/chrysenes (ug/g)	73	8	0.00039	0.01429	0.06	0.65
C2-Dibenzothiophenes (ug/g)	73	6	0.00015	0.00628	0.17	0.17
C2-Fluoranthrenes/pyrenes (ug/g)	73	2	0.0003	0.01416	0.22	0.06
C2-Fluorenes (ug/g)	73	20	0.0004	0.00588	0.04	0.76
C2-Naphthalenes (ug/g)	73	2	0.00022	0.01381	0.05	0.67
C2-Phenanthrenes/anthracenes (ug/g)	73	3	0.00052	0.02362	0.10	0.43
C3-Benzanthrene/chrysenes (ug/g)	73	29	0.00119	0.01124	-0.09	0.55
C3-Dibenzothiophenes (ug/g)	73	11	0.00024	0.00942	0.12	0.37
C3-Fluoranthrenes/pyrenes (ug/g)	73	12	0.00054	0.01044	0.16	0.22
C3-Fluorenes (ug/g)	73	30	0.00107	0.00829	-0.15	0.34
C3-Naphthalenes (ug/g)	73	6	0.0003	0.01002	0.08	0.50
C3-Phenanthrenes/anthracenes (ug/g)	73	3	0.00035	0.02263	0.25	0.04
C4-Benzanthrene/chrysenes (ug/g)	73	49	0.00037	0.0087	-0.02	0.93
C4-Dibenzothiophenes (ug/g)	73	26	0.00059	0.00742	0.05	0.76
C4-Naphthalenes (ug/g)	73	21	0.00035	0.00782	-0.02	0.90
C4-Phenanthrenes/anthracenes (ug/g)	73	16	0.00052	0.0115	0.19	0.16
Cholestane (ug/g)	73	9	0.0005	0.02622	0.15	0.23
Chrysene (ug/g)	73	0	0.00022	0.0242	0.32	0.01
D1-Diasterane-27[S] (ug/g)	73	22	0.00045	0.01049	-0.11	0.46
D2-Diasterane-27[R] (ug/g)	73	30	0.00038	0.00635	-0.13	0.42
D3a-Diasterane-28[S] (ug/g)	73	25	0.00034	0.00729	-0.02	0.88
D3-Diasterane-28[S] (ug/g)	73	26	0.00038	0.00559	-0.02	0.91
D4a-Diasterane-28[R] (ug/g)	73	24	0.0003	0.00692	-0.20	0.18
D4-Diasterane-28[R] (ug/g)	73	47	0.00027	0.00293	0.00	1.00
D5-Diasterane-29[S] (ug/g)	73	14	0.00027	0.01112	-0.01	0.92
D6-Diasterane-29[R] (ug/g)	73	17	0.00023	0.01064	-0.04	0.77
Dibenz(a,h)anthracene (ug/g)	73	17	0.00005	0.00365	0.11	0.42
Dibenzofuran (ug/g)	73	2	0.00004	0.00264	0.22	0.07
Dibenzothiophene (ug/g)	73	2	0.00002	0.00188	0.31	0.01
Fluoranthene (ug/g)	73	0	0.0002	0.02902	0.31	0.01
Fluorene (ug/g)	73	3	0.00003	0.0023	0.28	0.02
Indeno(1,2,3-cd)pyrene (ug/g)	73	0	0.00019	0.01676	0.29	0.01
Naphthalene (ug/g)	72	23	0.00053	0.00829	0.02	0.90
n-Decane (C10) (ug/g)	73	69	0.00099	0.0054	-0.95	0.05
n-Dodcosane (C22) (ug/g)	73	15	0.00377	81.29	0.04	0.76
n-Dotriacontane (C32) (ug/g)	73	30	0.01169	1031.54	0.28	0.07
n-Eicosane (C20) (ug/g)	73	59	0.00913	30.39	0.47	0.09
n-Heneicosane (C21) (ug/g)	73	23	0.00726	98.14	0.25	0.08
n-Hentriacontane (C31) (ug/g)	73	40	0.01267	0.2524	-0.03	0.88
n-Heptacosane (C27) (ug/g)	73	49	0.03692	801.1	0.50	0.01
n-Heptadecane (C17) (ug/g)	73	45	0.00565	16.96	0.17	0.37

Table A-7.

Parameter	Sediment Amphipod, 96-hours Survival					
	N	ND	Detect Range		Corr	Pvalue
n-Heptatriacontane (C37) (ug/g)	73	40	0.00266	0.06455	0.01	0.94
n-Hexacosane (C26) (ug/g)	73	52	0.05477	0.69998	-0.25	0.27
n-Hexadecane (C16) (ug/g)	73	45	0.00219	11.32	0.00	0.98
n-Hexatriacontane (C36) (ug/g)	73	30	0.00685	358.43	0.13	0.41
n-Nonacosane (C29) (ug/g)	73	49	0.03758	870.52	0.37	0.08
n-Nonadecane (C19) (ug/g)	73	56	0.00417	15.31	0.12	0.64
n-Nonatriacontane (C39) (ug/g)	73	41	0.00235	28.59	0.13	0.48
n-Octacosane (C28) (ug/g)	73	56	0.07247	0.17825	0.02	0.95
n-Octadecane (C18) (ug/g)	73	51	0.00579	17.73	0.41	0.06
n-Octatriacontane (C38) (ug/g)	73	39	0.00189	0.07612	0.04	0.84
Nonane (ug/g)	73	69	0.00244	0.00919	-0.11	0.89
Norpristane (1650) (ug/g)	73	59	0.0015	0.0099	-0.08	0.80
n-Pentacosane (C25) (ug/g)	73	51	0.01083	0.13357	0.24	0.28
n-Pentadecane (C15) (ug/g)	73	46	0.00671	21.88	0.14	0.49
n-Pentatriacontane (C35) (ug/g)	73	34	0.00594	461.48	0.20	0.22
n-Tetracontane (C40) (ug/g)	73	39	0.00168	22.26	0.04	0.81
n-Tetracosane (C24) (ug/g)	73	27	0.01619	136.02	0.10	0.49
n-Tetradecane (C14) (ug/g)	73	60	0.00137	0.0126	0.14	0.64
n-Tetratriacontane (C34) (ug/g)	73	33	0.01066	385.56	0.26	0.11
n-Tricontane (C30) (ug/g)	73	53	0.02667	0.16387	0.11	0.65
n-Tricosane (C23) (ug/g)	73	16	0.00357	202.81	0.15	0.26
n-Tridecane (C13) (ug/g)	73	70	0.00109	0.00376	0.00	1.00
n-Tritriacontane (C33) (ug/g)	73	34	0.00704	1095.75	0.19	0.25
Perylene (ug/g)	73	0	0.00401	0.23779	0.28	0.02
Phenanthrene (ug/g)	73	0	0.00012	0.01542	0.27	0.02
Phytane (ug/g)	73	51	0.00317	12.27	0.13	0.55
Pristane (ug/g)	73	45	0.00377	14.75	0.21	0.28
Pyrene (ug/g)	73	0	0.00025	0.02797	0.31	0.01
S10-Methylcholestane (ug/g)	73	35	0.00064	0.00765	-0.19	0.27
S11-Methylcholestane (ug/g)	73	25	0.00048	0.00846	-0.04	0.78
S12-Cholestane (ug/g)	73	8	0.00057	0.03054	0.19	0.12
S14-CHOLESTANE (20R) (ug/g)	73	16	0.00023	0.01216	-0.04	0.79
S15-Cholestane (20S) (ug/g)	73	16	0.00029	0.01288	-0.01	0.93
S18-Ethylcholestane (ug/g)	73	26	0.00039	0.00837	0.07	0.65
S19-Ethylcholestane (ug/g)	73	66	0.00045	0.00112	0.00	1.00
S1-Pregnane (ug/g)	73	41	0.00122	0.00971	-0.07	0.72
S20-Methylcholestane (ug/g)	73	13	0.00066	0.01015	0.07	0.59
S22-Methylcholestane(20R) (ug/g)	73	15	0.00039	0.01287	0.06	0.66
S23-Methylcholestane(20S) (ug/g)	73	15	0.00034	0.01535	0.08	0.55
S24-Methylcholestane (ug/g)	73	13	0.00035	0.00765	-0.02	0.89
S25-Ethylcholestane (ug/g)	73	14	0.00026	0.00983	0.00	0.99
S26-Ethylcholestane(20R) (ug/g)	73	5	0.00027	0.01798	0.26	0.03
S27-Ethylcholestane(20S) (ug/g)	73	7	0.00022	0.01618	0.23	0.06
S28-Ethylcholestane (ug/g)	73	13	0.0004	0.01135	0.06	0.64
S29-C30cholestane(R) (ug/g)	73	65	0.00025	0.00409	0.67	0.07

Table A-7.

Parameter	Sediment					
	Amphipod, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
S30-C30Cholestane(S) (ug/g)	73	46	0.00024	0.00333	0.13	0.53
S4-Diacholestane (ug/g)	73	19	0.00086	0.01999	-0.05	0.73
S5-Diacholestane (ug/g)	73	27	0.00071	0.01129	-0.11	0.47
S6-Diacholestane (ug/g)	73	52	0.00093	0.00432	0.08	0.74
S7-Diacholestane (ug/g)	73	24	0.00057	0.01029	-0.08	0.57
S8-Methyldiacholestane (ug/g)	73	23	0.00061	0.01117	-0.07	0.64
Sa-C21Diasterane (ug/g)	73	44	0.0009	0.00677	0.03	0.87
Sb-C21Sterane (ug/g)	73	33	0.00086	0.01007	-0.23	0.15
Sc-C22Diasterane (ug/g)	73	69	0.00083	0.00179	0.95	0.05
Sd-C22Sterane (ug/g)	73	60	0.00103	0.00434	0.43	0.15
T0-C19Diterpane (ug/g)	73	53	0.00014	0.00079	-0.46	0.04
T10-C29Tricyclitriterpane(R) (ug/g)	73	68	0.00092	0.00181	0.67	0.22
T11-Trisnorhopane(TS) (ug/g)	73	25	0.00052	0.00532	0.04	0.79
T12-Trisnorhopane(TM) (ug/g)	73	12	0.00036	0.00746	0.15	0.25
T13a-29,30-Bisnorhopane (ug/g)	73	37	0.00037	0.00459	0.22	0.20
T14a-C28,C30Bisnorhopane (ug/g)	73	61	0.00054	0.0022	0.36	0.25
T14-Bisnorhopane (ug/g)	73	65	0.00086	0.00264	-0.15	0.73
T15-C29-Norhopane (ug/g)	73	4	0.00059	0.01998	0.22	0.07
T16-Norneohopane (ug/g)	73	23	0.00063	0.0071	0.05	0.76
T17-C30-Normoretane (ug/g)	73	11	0.0006	0.01453	0.24	0.06
T18-C30-Oleanane (ug/g)	73	64	0.00069	0.00225	-0.21	0.59
T19-C30 Hopane (ug/g)	73	0	0.00042	0.03419	0.30	0.01
T1-C20Diterpane (ug/g)	73	25	0.00013	0.00224	-0.05	0.76
T20-Moretane (ug/g)	73	5	0.00045	0.01584	0.32	0.01
T21-C31-Homohopane(S) (ug/g)	73	15	0.00063	0.01601	0.13	0.33
T22a-Gammacerane (ug/g)	73	55	0.00066	0.00176	0.39	0.11
T22-C31-Homohopane(R) (ug/g)	73	1	0.00051	0.02224	0.30	0.01
T25-Diploptene (ug/g)	73	37	0.0012	0.04016	0.22	0.19
T26-C32-Bishomohopane(S) (ug/g)	73	14	0.00072	0.01401	0.36	0.01
T27-C32-Bishomohopane(R) (ug/g)	73	25	0.00056	0.01573	0.05	0.74
T28-Bishomomoretane (ug/g)	73	14	0.00054	0.01533	0.30	0.02
T29-Homohopane (ug/g)	73	68	0.00071	0.00316	-0.46	0.43
T2-C21Diterpane (ug/g)	73	35	0.00041	0.00317	0.14	0.42
T30-C33-Trishomohopane(S) (ug/g)	73	8	0.00051	0.0144	0.25	0.05
T31-C33-Trishomohopane(R) (ug/g)	73	36	0.00087	0.00529	-0.14	0.41
T32-Tetrakishomohopane(S) (ug/g)	73	37	0.00096	0.01949	0.23	0.18
T33-Tetrakishomohopane(R) (ug/g)	73	68	0.00054	0.00395	-0.05	0.93
T34-Pentakishomohopane(S) (ug/g)	73	67	0.00068	0.00199	0.75	0.08
T35-Pentakishomohopane(R) (ug/g)	73	65	0.0014	0.00459	0.35	0.39
T3-C22Diterpane (ug/g)	73	65	0.00057	0.00137	0.20	0.63
T4-C23Diterpane (ug/g)	73	26	0.00053	0.00704	0.04	0.77
T5-C24Diterpane (ug/g)	73	32	0.00039	0.00287	-0.02	0.91
T6a-C24Tetracyclic Terpane (ug/g)	73	51	0.00057	0.00214	0.09	0.69
T6b-C26Tricyclic[S] (ug/g)	73	55	0.00047	0.00636	-0.20	0.43
T6-C25Diterpane (ug/g)	73	34	0.00066	0.0033	-0.13	0.43

Table A-7.

Parameter	Sediment					
	Amphipod, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
T6c-C26Tricyclic[R] (ug/g)	73	62	0.00066	0.00192	0.34	0.30
T7-C28Tricyclictriterpane[S] (ug/g)	73	68	0.00068	0.00141	0.21	0.74
T8-C28Tricyclictriterpane[R] (ug/g)	73	63	0.00054	0.00167	-0.14	0.70
T9-C29Tricyclictriterpane(S) (ug/g)	73	65	0.00071	0.00179	0.74	0.04
SHC, Total (ug/g)	73	0	0.14258	7030.13	0.30	0.01
Total PAH (ug/g)	73	0	0.00836	0.51672	0.28	0.02
TPH (Diesel Range) (ug/g)	73	13	0.14678	45384.29	0.12	0.34
TPH, Total (ug/g)	73	8	0.04712	117372.75	0.26	0.04

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-8.

Parameter	Sediment					
	Mysid, 48-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
0.0015 mm (%)	20	2	2.8	53	-0.29	0.24
0.005 mm (%)	20	0	2.8	92	-0.17	0.47
0.030 mm (%)	20	0	3	100	-0.10	0.67
0.075 mm (%)	20	0	8.2	99.3	0.02	0.92
0.15 mm (%)	20	0	18.8	99.8	0.22	0.35
0.3 mm (%)	20	0	86.8	100	0.47	0.04
0.375 in (%)	20	0	96.8	100	0.08	0.74
0.6 mm (%)	20	0	88.5	100	0.43	0.06
0.75 in (%)	20	0	100	100	NA	NA
1.18 mm (%)	20	0	94.5	100	0.42	0.07
1.5 in (%)	20	0	100	100	NA	NA
2.00 mm (%)	20	0	96	100	-0.20	0.39
2.36 mm (%)	20	0	96.1	100	-0.20	0.39
3 in (%)	20	0	100	100	NA	NA
4.75 mm (%)	20	0	96.7	100	0.08	0.74
Gravel (%)	183	56	0	30.2	0.00	0.96
Sand (%)	183	0	0.42	99.7	-0.02	0.83
Silt, Clay, Colloids (%)	183	0	0.3	99.6	0.01	0.87
Moisture (%)	99	0	15.7	85.3	-0.18	0.08
Total Organic Carbon (ug/g)	183	22	661	180000	-0.17	0.03
Aluminum (ug/g)	183	0	1330	38600	-0.05	0.51
Antimony (ug/g)	180	151	0.14	17.9	0.20	0.30
Arsenic (ug/g)	183	0	1.3	46.2	-0.12	0.09
Barium (ug/g)	183	0	7.8	3980	-0.13	0.08
Beryllium (ug/g)	183	3	0.0082	45.8	-0.05	0.49
Cadmium (ug/g)	183	67	0.023	43	0.03	0.72
Calcium (ug/g)	183	0	892	60600	-0.07	0.37
Chromium (ug/g)	183	0	2.4	59.7	-0.09	0.25
Cobalt (ug/g)	183	0	1.7	47.5	-0.05	0.53
Copper (ug/g)	183	0	0.3	101	-0.11	0.15
Iron (ug/g)	183	0	2320	62700	-0.08	0.29
Lead (ug/g)	183	0	1.4	1190	-0.07	0.36
Magnesium (ug/g)	183	0	942	13100	-0.10	0.20
Manganese (ug/g)	183	0	29.5	1520	-0.06	0.46
Mercury (ug/g)	183	40	0.0094	0.093	-0.03	0.72
Nickel (ug/g)	183	0	3.9	62.6	-0.08	0.25
Potassium (ug/g)	183	0	303	8330	-0.06	0.38
Selenium (ug/g)	183	23	0.19	43.7	-0.16	0.04
Silver (ug/g)	183	141	0.063	0.37	0.23	0.14
Sodium (ug/g)	183	0	77.9	25600	-0.09	0.20
Thallium (ug/g)	176	164	0.11	47.5	-0.12	0.71
Vanadium (ug/g)	183	0	3.8	68.8	-0.07	0.36
Zinc (ug/g)	183	0	7.6	221	-0.08	0.25
1-Methylnaphthalene (ug/g)	97	86	0.00123	0.00293	0.22	0.51
2-Methylnaphthalene (ug/g)	183	164	0.00159	0.0114	-0.23	0.35
Acenaphthene (ug/g)	183	177	0.00139	0.0441	-0.89	0.02

Table A-8.

Parameter	Sediment					Pvalue
	Mysid, 48-hours					
	N	ND	Survival		Corr	
		Detect	Range			
Acenaphthylene (ug/g)	183	170	0.00186	0.0141	-0.28	0.35
Acetone (ug/g)	183	48	0.0114	0.216	-0.15	0.08
Anthracene (ug/g)	183	166	0.00178	0.191	-0.32	0.22
Benz(a)anthracene (ug/g)	183	135	0.00125	1.15	0.02	0.90
Benzo(a)pyrene (ug/g)	183	144	0.00169	1.49	-0.22	0.17
Benzo(b)fluoranthene (ug/g)	183	137	0.00136	1.46	-0.15	0.31
Benzo(e)pyrene (ug/g)	94	71	0.00125	0.0218	0.63	0.00
Benzo(g,h,i)perylene (ug/g)	183	159	0.0013	0.516	0.07	0.76
Benzo(k)fluoranthene (ug/g)	183	152	0.00128	0.45	-0.10	0.58
Bis(2-ethylhexyl) phthalate (ug/g)	183	161	0.107	0.544	0.07	0.74
C1-Benzanthrene/chrysenes (ug/g)	96	85	0.004	0.0561	0.03	0.92
C1-Fluoranthrenes/pyrenes (ug/g)	95	78	0.005	0.032	0.15	0.56
C1-Fluorenes (ug/g)	98	94	0.005	0.022	-0.74	0.26
C1-Phenanthrenes/anthracenes (ug/g)	99	86	0.0042	0.106	-0.32	0.28
C2-Benzanthrene/chrysenes (ug/g)	96	89	0.00882	0.0657	-0.41	0.36
C2-Fluoranthrenes/pyrenes (ug/g)	93	76	0.0028	0.039	0.18	0.49
C2-Fluorenes (ug/g)	98	93	0.0052	0.0438	-0.67	0.22
C2-Naphthalenes (ug/g)	97	83	0.0053	0.0375	-0.04	0.89
C2-Phenanthrenes/anthracenes (ug/g)	99	81	0.004	0.281	0.19	0.45
C3-Benzanthrene/chrysenes (ug/g)	96	92	0.00876	0.0311	-0.40	0.60
C3-Fluoranthrenes/pyrenes (ug/g)	93	83	0.0037	0.036	0.23	0.52
C3-Fluorenes (ug/g)	98	94	0.0081	0.0716	-0.21	0.79
C3-Naphthalenes (ug/g)	97	90	0.00687	0.0231	-0.40	0.37
C3-Phenanthrenes/anthracenes (ug/g)	99	90	0.003	0.187	-0.22	0.58
C4-Naphthalenes (ug/g)	97	92	0.0052	0.0341	-0.10	0.87
C4-Phenanthrenes/anthracenes (ug/g)	99	88	0.0037	0.132	0.06	0.86
Carbon Disulfide (ug/g)	182	127	0.00082	0.0227	-0.21	0.12
Chrysene (ug/g)	183	133	0.00097	0.972	-0.04	0.80
Dibenz(a,h)anthracene (ug/g)	183	174	0.00149	0.109	-0.18	0.65
Fluoranthene (ug/g)	183	108	0.00072	1.05	0.00	1.00
Fluorene (ug/g)	183	179	0.00178	0.0505	-0.80	0.20
Indeno(1,2,3-cd)pyrene (ug/g)	183	161	0.0015	0.424	0.05	0.82
Methyl ethyl ketone (ug/g)	183	174	0.0157	0.0423	-0.38	0.32
Methylene Chloride (ug/g)	183	180	0.003	0.0125	0.50	0.67
Naphthalene (ug/g)	183	146	0.00086	0.0259	-0.27	0.11
Oil and Grease, HEM (ug/g)	182	105	94.4	11800	-0.29	0.01
Perylene (ug/g)	98	39	0.00093	0.205	0.09	0.49
Phenanthrene (ug/g)	183	136	0.00174	0.522	0.04	0.77
Pyrene (ug/g)	183	117	0.00061	2.45	-0.04	0.72
Toluene (ug/g)	183	173	0.0012	0.0048	0.02	0.96
TPH (Diesel Range) (C10-C28) (ug/g)	183	104	3.75	407	-0.11	0.32
TPH (Oil Range) (C28-C35) (ug/g)	183	87	3	514	-0.20	0.06

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-9.

Parameter	Sediment					
	Mysid, 96-hours					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
0.001 mm (% passing)	63	4	0.5	55.5	0.12	0.36
0.002 mm (% passing)	63	1	0.5	62.5	0.05	0.72
0.005 mm (% passing)	63	1	1	75.5	0.05	0.69
0.02 mm (% passing)	63	0	1	93	0.05	0.68
0.05 mm (% passing)	63	0	3	98	0.09	0.50
0.064 mm (% passing)	63	0	5	99	0.08	0.52
0.075 mm (% passing)	63	0	8.3	99.2	0.07	0.61
0.15 mm (% passing)	63	0	34.3	99.7	0.09	0.49
0.3 mm (% passing)	63	0	83.7	99.8	0.11	0.40
0.6 mm (% passing)	63	0	90.5	99.9	0.13	0.32
1.18 mm (% passing)	63	0	93.4	99.9	0.00	0.97
19 mm (% passing)	63	0	100	100	NA	NA
2.36 mm (% passing)	63	0	95.7	100	-0.07	0.58
3.35 mm (% passing)	63	0	96.6	100	-0.04	0.78
37.5 mm (% passing)	63	0	100	100	NA	NA
4.75 mm (% passing)	63	0	96.9	100	0.02	0.86
75 mm (% passing)	63	0	100	100	NA	NA
Clay (%)	63	1	1	75.5	0.05	0.69
Gravel (%)	63	58	0.5	3.1	-0.56	0.32
Sand (%)	63	0	0.7	91.7	-0.09	0.50
Silt (%)	63	0	7.7	67.6	0.00	0.99
Moisture (%)	60	0	18.7	76.7	0.00	0.98
Total Organic Carbon (ug/g)	60	0	1340	48900	0.00	0.98
15a-methyl-17a(H)-27-Norhopane (ug/g)	64	41	0.00062	0.00391	0.24	0.26
2,6,10 Trimethyldodecane (1380) (ug/g)	64	60	0.00081	0.01263	-0.95	0.05
2,6,10 Trimethyltridecane (1470) (ug/g)	64	54	0.00197	0.0119	-0.46	0.18
A1-C20-TAS (ug/g)	64	38	0.00012	0.00155	0.24	0.23
A2-C21-TAS (ug/g)	64	29	0.00013	0.00175	0.24	0.17
A3-C26 TAS(20S) (ug/g)	64	2	0.00011	0.00344	0.01	0.92
A4-C26/C27-TAS (ug/g)	64	1	0.00007	0.00547	-0.11	0.38
A5-C27-TAS(20R) (ug/g)	64	4	0.0001	0.00366	0.00	0.98
A6-TAS(20S) (ug/g)	64	5	0.00007	0.00521	-0.06	0.65
A7-TAS(20R) (ug/g)	64	8	0.00009	0.00359	-0.11	0.41
Acenaphthene (ug/g)	64	6	0.00004	0.00124	-0.25	0.06
Acenaphthylene (ug/g)	64	4	0.00003	0.00258	-0.03	0.82
Anthracene (ug/g)	64	1	0.00003	0.00424	-0.14	0.29
Benz(a)anthracene (ug/g)	64	0	0.00011	0.01458	-0.10	0.45
Benzo(a)pyrene (ug/g)	64	2	0.00019	0.01768	-0.09	0.47
Benzo(b)fluoranthene (ug/g)	64	0	0.00027	0.02004	-0.09	0.47
Benzo(e)pyrene (ug/g)	64	6	0.00026	0.0165	0.04	0.78
Benzo(g,h,i)perylene (ug/g)	64	1	0.00022	0.01635	-0.01	0.96
Benzo(k)fluoranthene (ug/g)	64	3	0.00022	0.01906	0.03	0.82
Biphenyl (ug/g)	64	1	0.00006	0.00188	-0.02	0.89
C1-Benzanthrene/chrysenes (ug/g)	64	0	0.00029	0.01606	-0.08	0.50
C1-Dibenzothiophenes (ug/g)	64	13	0.00007	0.01286	-0.03	0.81

Table A-9.

Parameter	Sediment					
	Mysid, 96-hours					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
C1-Fluoranthrenes/pyrenes (ug/g)	64	0	0.00028	0.01612	-0.08	0.54
C1-Fluorenes (ug/g)	64	9	0.00011	0.00258	-0.15	0.26
C1-Naphthalenes (ug/g)	64	0	0.00014	0.00873	-0.05	0.67
C1-Phenanthrenes/anthracenes (ug/g)	64	4	0.00032	0.01594	-0.14	0.28
C2-Benzanthrene/chrysenes (ug/g)	64	8	0.00039	0.01429	-0.09	0.53
C2-Dibenzothiophenes (ug/g)	64	6	0.00015	0.00628	0.01	0.91
C2-Fluoranthrenes/pyrenes (ug/g)	64	2	0.0003	0.01416	-0.10	0.45
C2-Fluorenes (ug/g)	64	20	0.0004	0.00588	0.03	0.84
C2-Naphthalenes (ug/g)	64	2	0.00022	0.01381	0.03	0.80
C2-Phenanthrenes/anthracenes (ug/g)	64	3	0.00052	0.02362	-0.02	0.87
C3-Benzanthrene/chrysenes (ug/g)	64	29	0.00119	0.01124	0.14	0.44
C3-Dibenzothiophenes (ug/g)	64	11	0.00024	0.00942	0.03	0.83
C3-Fluoranthrenes/pyrenes (ug/g)	64	12	0.00054	0.01044	-0.19	0.17
C3-Fluorenes (ug/g)	64	30	0.00107	0.00829	0.02	0.89
C3-Naphthalenes (ug/g)	64	6	0.0003	0.01002	-0.09	0.49
C3-Phenanthrenes/anthracenes (ug/g)	64	3	0.00035	0.02263	-0.04	0.78
C4-Benzanthrene/chrysenes (ug/g)	64	44	0.00037	0.0087	-0.11	0.65
C4-Dibenzothiophenes (ug/g)	64	26	0.00059	0.00742	0.06	0.72
C4-Naphthalenes (ug/g)	64	21	0.00035	0.00782	0.14	0.36
C4-Phenanthrenes/anthracenes (ug/g)	64	16	0.00052	0.0115	-0.10	0.49
Cholestane (ug/g)	64	9	0.0005	0.02622	-0.14	0.30
Chrysene (ug/g)	64	0	0.00022	0.0242	-0.08	0.55
D1-Diasterane-27[S] (ug/g)	64	22	0.00045	0.01049	0.09	0.56
D2-Diasterane-27[R] (ug/g)	64	29	0.00038	0.00635	0.17	0.32
D3a-Diasterane-28[S] (ug/g)	64	25	0.00034	0.00729	0.11	0.50
D3-Diasterane-28[S] (ug/g)	64	26	0.00038	0.00559	0.12	0.47
D4a-Diasterane-28[R] (ug/g)	64	24	0.0003	0.00692	0.03	0.87
D4-Diasterane-28[R] (ug/g)	64	42	0.00027	0.00293	0.06	0.79
D5-Diasterane-29[S] (ug/g)	64	14	0.00027	0.01112	-0.04	0.78
D6-Diasterane-29[R] (ug/g)	64	17	0.00023	0.01064	0.00	0.98
Dibenz(a,h)anthracene (ug/g)	64	17	0.00005	0.00365	0.11	0.45
Dibenzofuran (ug/g)	64	2	0.00004	0.00264	-0.06	0.62
Dibenzothiophene (ug/g)	64	2	0.00002	0.00188	-0.17	0.17
Fluoranthene (ug/g)	64	0	0.0002	0.02902	-0.14	0.26
Fluorene (ug/g)	64	3	0.00003	0.0023	-0.19	0.15
Indeno(1,2,3-cd)pyrene (ug/g)	64	0	0.00019	0.01676	-0.08	0.55
Naphthalene (ug/g)	63	23	0.00053	0.00829	0.13	0.41
n-Decane (C10) (ug/g)	64	60	0.00099	0.0054	0.80	0.20
n-Dodcosane (C22) (ug/g)	64	15	0.00377	81.29	0.15	0.30
n-Dotriacontane (C32) (ug/g)	64	22	0.01169	1031.54	-0.31	0.05
n-Eicosane (C20) (ug/g)	64	52	0.00913	30.39	-0.03	0.92
n-Heneicosane (C21) (ug/g)	64	20	0.00726	98.14	-0.06	0.72
n-Hentriacontane (C31) (ug/g)	64	31	0.01267	0.2524	-0.19	0.28
n-Heptacosane (C27) (ug/g)	64	41	0.03692	801.1	-0.29	0.18
n-Heptadecane (C17) (ug/g)	64	36	0.00565	16.96	-0.47	0.01

Table A-9.

Parameter	Sediment					Pvalue
	Mysid, 96-hours					
	N	ND	Detect Range		Corr	
n-Heptatriacontane (C37) (ug/g)	64	31	0.00266	0.06455	-0.22	0.22
n-Hexacosane (C26) (ug/g)	64	44	0.05477	0.69998	0.22	0.34
n-Hexadecane (C16) (ug/g)	64	36	0.00219	11.32	-0.42	0.02
n-Hexatriacontane (C36) (ug/g)	64	22	0.00685	358.43	-0.30	0.06
n-Nonacosane (C29) (ug/g)	64	41	0.03758	870.52	-0.23	0.30
n-Nonadecane (C19) (ug/g)	64	47	0.00417	15.31	-0.60	0.01
n-Nonatriacontane (C39) (ug/g)	64	32	0.00235	28.59	-0.24	0.19
n-Octacosane (C28) (ug/g)	64	48	0.07247	0.17825	0.29	0.28
n-Octadecane (C18) (ug/g)	64	42	0.00579	17.73	-0.48	0.02
n-Octatriacontane (C38) (ug/g)	64	30	0.00189	0.07612	-0.19	0.29
Nonane (ug/g)	64	60	0.00244	0.00919	-0.20	0.80
Norpristane (1650) (ug/g)	64	50	0.0015	0.0099	0.05	0.87
n-Pentacosane (C25) (ug/g)	64	43	0.01083	0.13357	0.18	0.43
n-Pentadecane (C15) (ug/g)	64	37	0.00671	21.88	-0.57	0.00
n-Pentatriacontane (C35) (ug/g)	64	26	0.00594	461.48	-0.30	0.07
n-Tetracontane (C40) (ug/g)	64	30	0.00168	22.26	-0.20	0.27
n-Tetracosane (C24) (ug/g)	64	27	0.01619	136.02	0.20	0.24
n-Tetradecane (C14) (ug/g)	64	51	0.00137	0.0126	-0.56	0.05
n-Tetratriacontane (C34) (ug/g)	64	25	0.01066	385.56	-0.09	0.58
n-Tricontane (C30) (ug/g)	64	45	0.02667	0.16387	0.29	0.23
n-Tricosane (C23) (ug/g)	64	16	0.00357	202.81	0.19	0.19
n-Tridecane (C13) (ug/g)	64	61	0.00109	0.00376	-0.50	0.67
n-Tritriacontane (C33) (ug/g)	64	26	0.00704	1095.75	-0.41	0.01
Perylene (ug/g)	64	0	0.00401	0.23779	-0.17	0.19
Phenanthrene (ug/g)	64	0	0.00012	0.01542	-0.13	0.29
Phytane (ug/g)	64	42	0.00317	12.27	-0.54	0.01
Pristane (ug/g)	64	36	0.00377	14.75	-0.51	0.01
Pyrene (ug/g)	64	0	0.00025	0.02797	-0.12	0.36
S10-Methylcholestane (ug/g)	64	35	0.00064	0.00765	-0.11	0.57
S11-Methylcholestane (ug/g)	64	25	0.00048	0.00846	0.07	0.67
S12-Cholestane (ug/g)	64	8	0.00057	0.03054	-0.10	0.47
S14-CHOLESTANE (20R) (ug/g)	64	16	0.00023	0.01216	0.00	0.99
S15-Cholestane (20S) (ug/g)	64	16	0.00029	0.01288	0.01	0.93
S18-Ethylcholestane (ug/g)	64	26	0.00039	0.00837	0.34	0.04
S19-Ethylcholestane (ug/g)	64	57	0.00045	0.00112	0.59	0.16
S1-Pregnane (ug/g)	64	39	0.00122	0.00971	0.12	0.58
S20-Methylcholestane (ug/g)	64	13	0.00066	0.01015	-0.07	0.61
S22-Methylcholestane(20R) (ug/g)	64	15	0.00039	0.01287	-0.06	0.66
S23-Methylcholestane(20S) (ug/g)	64	15	0.00034	0.01535	-0.05	0.73
S24-Methylcholestane (ug/g)	64	13	0.00035	0.00765	-0.10	0.50
S25-Ethylcholestane (ug/g)	64	14	0.00026	0.00983	-0.04	0.80
S26-Ethylcholestane(20R) (ug/g)	64	5	0.00027	0.01798	-0.16	0.22
S27-Ethylcholestane(20S) (ug/g)	64	7	0.00022	0.01618	-0.12	0.38
S28-Ethylcholestane (ug/g)	64	13	0.0004	0.01135	-0.14	0.34
S29-C30cholestane(R) (ug/g)	64	57	0.00025	0.00409	-0.04	0.94

Table A-9.

Parameter	Sediment					Pvalue
	Mysid, 96-hours					
	N	ND	Detect Range		Corr	
S30-C30Cholestane(S) (ug/g)	64	38	0.00024	0.00333	0.09	0.66
S4-Diacholestane (ug/g)	64	19	0.00086	0.01999	0.02	0.91
S5-Diacholestane (ug/g)	64	27	0.00071	0.01129	0.13	0.43
S6-Diacholestane (ug/g)	64	45	0.00093	0.00432	0.56	0.01
S7-Diacholestane (ug/g)	64	24	0.00057	0.01029	0.03	0.85
S8-Methyldiacholestane (ug/g)	64	23	0.00061	0.01117	0.06	0.71
Sa-C21Diasterane (ug/g)	64	41	0.0009	0.00677	0.15	0.50
Sb-C21Sterane (ug/g)	64	33	0.00086	0.01007	-0.11	0.56
Sc-C22Diasterane (ug/g)	64	60	0.00083	0.00179	-0.63	0.37
Sd-C22Sterane (ug/g)	64	52	0.00103	0.00434	0.64	0.02
T0-C19Diterpane (ug/g)	64	44	0.00014	0.00079	-0.30	0.21
T10-C29Tricyclitriterpane(R) (ug/g)	64	59	0.00092	0.00181	-0.87	0.05
T11-Trisnorhopane(TS) (ug/g)	64	25	0.00052	0.00532	0.15	0.36
T12-Trisnorhopane(TM) (ug/g)	64	12	0.00036	0.00746	-0.08	0.55
T13a-29,30-Bisnorhopane (ug/g)	64	29	0.00037	0.00459	-0.05	0.76
T14a-C28,C30Bisnorhopane (ug/g)	64	52	0.00054	0.0022	0.33	0.30
T14-Bisnorhopane (ug/g)	64	58	0.00086	0.00264	0.46	0.35
T15-C29-Norhopane (ug/g)	64	4	0.00059	0.01998	-0.12	0.34
T16-Norneohopane (ug/g)	64	23	0.00063	0.0071	0.17	0.28
T17-C30-Normoretane (ug/g)	64	11	0.0006	0.01453	-0.24	0.09
T18-C30-Oleanane (ug/g)	64	56	0.00069	0.00225	0.22	0.60
T19-C30 Hopane (ug/g)	64	0	0.00042	0.03419	-0.05	0.68
T1-C20Diterpane (ug/g)	64	25	0.00013	0.00224	0.18	0.27
T20-Moretane (ug/g)	64	5	0.00045	0.01584	-0.20	0.13
T21-C31-Homohopane(S) (ug/g)	64	15	0.00063	0.01601	-0.14	0.33
T22a-Gammacerane (ug/g)	64	50	0.00066	0.00176	-0.33	0.25
T22-C31-Homohopane(R) (ug/g)	64	1	0.00051	0.02224	-0.14	0.27
T25-Diploptene (ug/g)	64	37	0.0012	0.04016	0.01	0.95
T26-C32-Bishomohopane(S) (ug/g)	64	14	0.00072	0.01401	-0.11	0.45
T27-C32-Bishomohopane(R) (ug/g)	64	25	0.00056	0.01573	0.08	0.62
T28-Bishomomoretane (ug/g)	64	14	0.00054	0.01533	-0.24	0.10
T29-Homohopane (ug/g)	64	59	0.00071	0.00316	-0.95	0.01
T2-C21Diterpane (ug/g)	64	31	0.00041	0.00317	0.14	0.45
T30-C33-Trishomohopane(S) (ug/g)	64	8	0.00051	0.0144	-0.12	0.39
T31-C33-Trishomohopane(R) (ug/g)	64	36	0.00087	0.00529	0.19	0.32
T32-Tetrakishomohopane(S) (ug/g)	64	36	0.00096	0.01949	-0.22	0.25
T33-Tetrakishomohopane(R) (ug/g)	64	59	0.00054	0.00395	-0.80	0.10
T34-Pentakishomohopane(S) (ug/g)	64	58	0.00068	0.00199	0.21	0.69
T35-Pentakishomohopane(R) (ug/g)	64	57	0.0014	0.00459	0.34	0.46
T3-C22Diterpane (ug/g)	64	56	0.00057	0.00137	0.25	0.56
T4-C23Diterpane (ug/g)	64	26	0.00053	0.00704	-0.01	0.94
T5-C24Diterpane (ug/g)	64	32	0.00039	0.00287	0.29	0.11
T6a-C24Tetracyclic Terpane (ug/g)	64	46	0.00057	0.00214	-0.16	0.52
T6b-C26Tricyclic[S] (ug/g)	64	46	0.00047	0.00636	0.03	0.90
T6-C25Diterpane (ug/g)	64	34	0.00066	0.0033	0.14	0.48

Table A-9.

Parameter	Sediment					
	Mysid, 96-hours					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
T6c-C26Tricyclic[R] (ug/g)	64	55	0.00066	0.00192	-0.15	0.71
T7-C28Tricyclictriterpane[S] (ug/g)	64	59	0.00068	0.00141	0.15	0.80
T8-C28Tricyclictriterpane[R] (ug/g)	64	55	0.00054	0.00167	-0.06	0.88
T9-C29Tricyclictriterpane(S) (ug/g)	64	56	0.00071	0.00179	0.06	0.88
SHC, Total (ug/g)	64	0	0.14258	7030.13	-0.10	0.42
Total PAH (ug/g)	64	0	0.00836	0.51672	-0.14	0.27
TPH (Diesel Range) (ug/g)	64	13	0.14678	45384.29	0.25	0.08
TPH, Total (ug/g)	64	8	0.04712	117372.75	-0.11	0.41

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-10.

Parameter	Sediment					
	Mysid, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
0.001 mm (% passing)	63	4	0.5	55.5	-0.04	0.76
0.002 mm (% passing)	63	1	0.5	62.5	-0.05	0.69
0.005 mm (% passing)	63	1	1	75.5	-0.05	0.68
0.02 mm (% passing)	63	0	1	93	0.02	0.90
0.05 mm (% passing)	63	0	3	98	0.02	0.88
0.064 mm (% passing)	63	0	5	99	0.00	0.98
0.075 mm (% passing)	63	0	8.3	99.2	-0.04	0.77
0.15 mm (% passing)	63	0	34.3	99.7	-0.12	0.36
0.3 mm (% passing)	63	0	83.7	99.8	-0.20	0.12
0.6 mm (% passing)	63	0	90.5	99.9	-0.14	0.26
1.18 mm (% passing)	63	0	93.4	99.9	-0.23	0.07
19 mm (% passing)	63	0	100	100	NA	NA
2.36 mm (% passing)	63	0	95.7	100	-0.21	0.10
3.35 mm (% passing)	63	0	96.6	100	-0.11	0.38
37.5 mm (% passing)	63	0	100	100	NA	NA
4.75 mm (% passing)	63	0	96.9	100	-0.10	0.45
75 mm (% passing)	63	0	100	100	NA	NA
Clay (%)	63	1	1	75.5	-0.05	0.68
Gravel (%)	63	58	0.5	3.1	-0.32	0.59
Sand (%)	63	0	0.7	91.7	0.00	0.97
Silt (%)	63	0	7.7	67.6	0.15	0.23
Moisture (%)	60	0	18.7	76.7	-0.08	0.53
Total Organic Carbon (ug/g)	60	0	1340	48900	0.06	0.66
15a-methyl-17a(H)-27-Norhopane (ug/g)	64	41	0.00062	0.00391	-0.03	0.89
2,6,10 Trimethyldodecane (1380) (ug/g)	64	60	0.00081	0.01263	0.26	0.74
2,6,10 Trimethyltridecane (1470) (ug/g)	64	54	0.00197	0.0119	-0.42	0.23
A1-C20-TAS (ug/g)	64	38	0.00012	0.00155	-0.02	0.94
A2-C21-TAS (ug/g)	64	29	0.00013	0.00175	0.00	0.98
A3-C26 TAS(20S) (ug/g)	64	2	0.00011	0.00344	-0.19	0.14
A4-C26/C27-TAS (ug/g)	64	1	0.00007	0.00547	-0.02	0.90
A5-C27-TAS(20R) (ug/g)	64	4	0.0001	0.00366	-0.01	0.96
A6-TAS(20S) (ug/g)	64	5	0.00007	0.00521	-0.05	0.71
A7-TAS(20R) (ug/g)	64	8	0.00009	0.00359	-0.03	0.82
Acenaphthene (ug/g)	64	6	0.00004	0.00124	-0.04	0.77
Acenaphthylene (ug/g)	64	4	0.00003	0.00258	0.00	0.98
Anthracene (ug/g)	64	1	0.00003	0.00424	0.05	0.70
Benz(a)anthracene (ug/g)	64	0	0.00011	0.01458	0.10	0.43
Benzo(a)pyrene (ug/g)	64	2	0.00019	0.01768	0.10	0.43
Benzo(b)fluoranthene (ug/g)	64	0	0.00027	0.02004	0.07	0.61
Benzo(e)pyrene (ug/g)	64	6	0.00026	0.0165	0.10	0.47
Benzo(g,h,i)perylene (ug/g)	64	1	0.00022	0.01635	0.01	0.95
Benzo(k)fluoranthene (ug/g)	64	3	0.00022	0.01906	0.07	0.59
Biphenyl (ug/g)	64	1	0.00006	0.00188	0.06	0.65
C1-Benzanthrene/chrysenes (ug/g)	64	0	0.00029	0.01606	0.05	0.72
C1-Dibenzothiophenes (ug/g)	64	13	0.00007	0.01286	-0.05	0.74

Table A-10.

Parameter	Sediment					
	Mysid, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
C1-Fluoranthrenes/pyrenes (ug/g)	64	0	0.00028	0.01612	0.09	0.50
C1-Fluorenes (ug/g)	64	9	0.00011	0.00258	0.02	0.88
C1-Naphthalenes (ug/g)	64	0	0.00014	0.00873	0.03	0.80
C1-Phenanthrenes/anthracenes (ug/g)	64	4	0.00032	0.01594	0.03	0.85
C2-Benzanthrene/chrysenes (ug/g)	64	8	0.00039	0.01429	0.03	0.84
C2-Dibenzothiophenes (ug/g)	64	6	0.00015	0.00628	0.00	0.98
C2-Fluoranthrenes/pyrenes (ug/g)	64	2	0.0003	0.01416	0.04	0.75
C2-Fluorenes (ug/g)	64	20	0.0004	0.00588	-0.02	0.89
C2-Naphthalenes (ug/g)	64	2	0.00022	0.01381	-0.09	0.50
C2-Phenanthrenes/anthracenes (ug/g)	64	3	0.00052	0.02362	-0.08	0.52
C3-Benzanthrene/chrysenes (ug/g)	64	29	0.00119	0.01124	-0.06	0.72
C3-Dibenzothiophenes (ug/g)	64	11	0.00024	0.00942	0.08	0.55
C3-Fluoranthrenes/pyrenes (ug/g)	64	12	0.00054	0.01044	0.03	0.82
C3-Fluorenes (ug/g)	64	30	0.00107	0.00829	-0.27	0.13
C3-Naphthalenes (ug/g)	64	6	0.0003	0.01002	-0.07	0.60
C3-Phenanthrenes/anthracenes (ug/g)	64	3	0.00035	0.02263	0.07	0.58
C4-Benzanthrene/chrysenes (ug/g)	64	44	0.00037	0.0087	-0.46	0.04
C4-Dibenzothiophenes (ug/g)	64	26	0.00059	0.00742	0.04	0.83
C4-Naphthalenes (ug/g)	64	21	0.00035	0.00782	-0.18	0.25
C4-Phenanthrenes/anthracenes (ug/g)	64	16	0.00052	0.0115	0.11	0.46
Cholestane (ug/g)	64	9	0.0005	0.02622	0.04	0.76
Chrysene (ug/g)	64	0	0.00022	0.0242	0.06	0.64
D1-Diasterane-27[S] (ug/g)	64	22	0.00045	0.01049	-0.05	0.73
D2-Diasterane-27[R] (ug/g)	64	29	0.00038	0.00635	0.05	0.76
D3a-Diasterane-28[S] (ug/g)	64	25	0.00034	0.00729	0.04	0.80
D3-Diasterane-28[S] (ug/g)	64	26	0.00038	0.00559	0.03	0.87
D4a-Diasterane-28[R] (ug/g)	64	24	0.0003	0.00692	-0.11	0.51
D4-Diasterane-28[R] (ug/g)	64	42	0.00027	0.00293	-0.32	0.15
D5-Diasterane-29[S] (ug/g)	64	14	0.00027	0.01112	0.02	0.87
D6-Diasterane-29[R] (ug/g)	64	17	0.00023	0.01064	-0.03	0.83
Dibenz(a,h)anthracene (ug/g)	64	17	0.00005	0.00365	-0.06	0.68
Dibenzofuran (ug/g)	64	2	0.00004	0.00264	0.07	0.57
Dibenzothiophene (ug/g)	64	2	0.00002	0.00188	0.01	0.94
Fluoranthene (ug/g)	64	0	0.0002	0.02902	0.09	0.47
Fluorene (ug/g)	64	3	0.00003	0.0023	-0.03	0.80
Indeno(1,2,3-cd)pyrene (ug/g)	64	0	0.00019	0.01676	0.05	0.68
Naphthalene (ug/g)	63	23	0.00053	0.00829	-0.09	0.57
n-Decane (C10) (ug/g)	64	60	0.00099	0.0054	-0.63	0.37
n-Dodcosane (C22) (ug/g)	64	15	0.00377	81.29	0.08	0.59
n-Dotriacontane (C32) (ug/g)	64	22	0.01169	1031.54	0.02	0.88
n-Eicosane (C20) (ug/g)	64	52	0.00913	30.39	0.49	0.10
n-Heneicosane (C21) (ug/g)	64	20	0.00726	98.14	0.05	0.75
n-Hentriacontane (C31) (ug/g)	64	31	0.01267	0.2524	-0.02	0.91
n-Heptacosane (C27) (ug/g)	64	41	0.03692	801.1	0.04	0.86
n-Heptadecane (C17) (ug/g)	64	36	0.00565	16.96	-0.20	0.32

Table A-10.

Parameter	Sediment					
	Mysid, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
n-Heptatriacontane (C37) (ug/g)	64	31	0.00266	0.06455	-0.20	0.27
n-Hexacosane (C26) (ug/g)	64	44	0.05477	0.69998	-0.44	0.05
n-Hexadecane (C16) (ug/g)	64	36	0.00219	11.32	-0.28	0.15
n-Hexatriacontane (C36) (ug/g)	64	22	0.00685	358.43	0.09	0.57
n-Nonacosane (C29) (ug/g)	64	41	0.03758	870.52	-0.13	0.57
n-Nonadecane (C19) (ug/g)	64	47	0.00417	15.31	-0.05	0.86
n-Nonatriacontane (C39) (ug/g)	64	32	0.00235	28.59	-0.29	0.11
n-Octacosane (C28) (ug/g)	64	48	0.07247	0.17825	-0.44	0.08
n-Octadecane (C18) (ug/g)	64	42	0.00579	17.73	-0.06	0.80
n-Octatriacontane (C38) (ug/g)	64	30	0.00189	0.07612	-0.28	0.10
Nonane (ug/g)	64	60	0.00244	0.00919	0.32	0.68
Norpristane (1650) (ug/g)	64	50	0.0015	0.0099	-0.29	0.31
n-Pentacosane (C25) (ug/g)	64	43	0.01083	0.13357	-0.16	0.49
n-Pentadecane (C15) (ug/g)	64	37	0.00671	21.88	-0.19	0.35
n-Pentatriacontane (C35) (ug/g)	64	26	0.00594	461.48	-0.08	0.62
n-Tetracontane (C40) (ug/g)	64	30	0.00168	22.26	-0.38	0.03
n-Tetracosane (C24) (ug/g)	64	27	0.01619	136.02	0.25	0.14
n-Tetradecane (C14) (ug/g)	64	51	0.00137	0.0126	-0.27	0.38
n-Tetratriacontane (C34) (ug/g)	64	25	0.01066	385.56	-0.02	0.90
n-Tricontane (C30) (ug/g)	64	45	0.02667	0.16387	-0.18	0.47
n-Tricosane (C23) (ug/g)	64	16	0.00357	202.81	0.13	0.37
n-Tridecane (C13) (ug/g)	64	61	0.00109	0.00376	0.87	0.33
n-Tritriacontane (C33) (ug/g)	64	26	0.00704	1095.75	0.11	0.53
Perylene (ug/g)	64	0	0.00401	0.23779	0.11	0.37
Phenanthrene (ug/g)	64	0	0.00012	0.01542	0.05	0.70
Phytane (ug/g)	64	42	0.00317	12.27	-0.23	0.29
Pristane (ug/g)	64	36	0.00377	14.75	-0.24	0.22
Pyrene (ug/g)	64	0	0.00025	0.02797	0.07	0.56
S10-Methyldiacholestane (ug/g)	64	35	0.00064	0.00765	0.08	0.68
S11-Methyldiacholestane (ug/g)	64	25	0.00048	0.00846	0.06	0.71
S12-Cholestane (ug/g)	64	8	0.00057	0.03054	0.04	0.76
S14-CHOLESTANE (20R) (ug/g)	64	16	0.00023	0.01216	0.09	0.56
S15-Cholestane (20S) (ug/g)	64	16	0.00029	0.01288	0.05	0.73
S18-Ethyldiacholestane (ug/g)	64	26	0.00039	0.00837	0.15	0.37
S19-Ethyldiacholestane (ug/g)	64	57	0.00045	0.00112	-0.22	0.64
S1-Pregnane (ug/g)	64	39	0.00122	0.00971	-0.03	0.88
S20-Methylcholestane (ug/g)	64	13	0.00066	0.01015	-0.04	0.79
S22-Methylcholestane(20R) (ug/g)	64	15	0.00039	0.01287	0.09	0.56
S23-Methylcholestane(20S) (ug/g)	64	15	0.00034	0.01535	0.14	0.32
S24-Methylcholestane (ug/g)	64	13	0.00035	0.00765	0.06	0.68
S25-Ethylcholestane (ug/g)	64	14	0.00026	0.00983	0.03	0.85
S26-Ethylcholestane(20R) (ug/g)	64	5	0.00027	0.01798	0.03	0.81
S27-Ethylcholestane(20S) (ug/g)	64	7	0.00022	0.01618	0.03	0.81
S28-Ethylcholestane (ug/g)	64	13	0.0004	0.01135	-0.03	0.85
S29-C30cholestane(R) (ug/g)	64	57	0.00025	0.00409	-0.21	0.66

Table A-10.

Parameter	Sediment					
	Mysid, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
S30-C30Cholestane(S) (ug/g)	64	38	0.00024	0.00333	-0.32	0.11
S4-Diacholestane (ug/g)	64	19	0.00086	0.01999	0.05	0.76
S5-Diacholestane (ug/g)	64	27	0.00071	0.01129	0.10	0.57
S6-Diacholestane (ug/g)	64	45	0.00093	0.00432	-0.09	0.71
S7-Diacholestane (ug/g)	64	24	0.00057	0.01029	0.01	0.97
S8-Methyldiacholestane (ug/g)	64	23	0.00061	0.01117	0.01	0.95
Sa-C21Diasterane (ug/g)	64	41	0.0009	0.00677	-0.06	0.79
Sb-C21Sterane (ug/g)	64	33	0.00086	0.01007	0.13	0.48
Sc-C22Diasterane (ug/g)	64	60	0.00083	0.00179	0.80	0.20
Sd-C22Sterane (ug/g)	64	52	0.00103	0.00434	-0.09	0.78
T0-C19Diterpane (ug/g)	64	44	0.00014	0.00079	-0.18	0.44
T10-C29Tricyclitriterpane(R) (ug/g)	64	59	0.00092	0.00181	0.40	0.50
T11-Trisnorhopane(TS) (ug/g)	64	25	0.00052	0.00532	-0.08	0.61
T12-Trisnorhopane(TM) (ug/g)	64	12	0.00036	0.00746	-0.06	0.68
T13a-29,30-Bisnorhopane (ug/g)	64	29	0.00037	0.00459	-0.09	0.59
T14a-C28,C30Bisnorhopane (ug/g)	64	52	0.00054	0.0022	-0.20	0.53
T14-Bisnorhopane (ug/g)	64	58	0.00086	0.00264	0.62	0.19
T15-C29-Norhopane (ug/g)	64	4	0.00059	0.01998	-0.02	0.90
T16-Norneohopane (ug/g)	64	23	0.00063	0.0071	0.11	0.50
T17-C30-Normoretane (ug/g)	64	11	0.0006	0.01453	0.03	0.84
T18-C30-Oleanane (ug/g)	64	56	0.00069	0.00225	0.39	0.34
T19-C30 Hopane (ug/g)	64	0	0.00042	0.03419	0.00	1.00
T1-C20Diterpane (ug/g)	64	25	0.00013	0.00224	-0.03	0.85
T20-Moretane (ug/g)	64	5	0.00045	0.01584	0.05	0.73
T21-C31-Homohopane(S) (ug/g)	64	15	0.00063	0.01601	0.00	0.98
T22a-Gammacerane (ug/g)	64	50	0.00066	0.00176	0.44	0.12
T22-C31-Homohopane(R) (ug/g)	64	1	0.00051	0.02224	0.13	0.30
T25-Diploptene (ug/g)	64	37	0.0012	0.04016	0.01	0.97
T26-C32-Bishomohopane(S) (ug/g)	64	14	0.00072	0.01401	0.16	0.28
T27-C32-Bishomohopane(R) (ug/g)	64	25	0.00056	0.01573	0.15	0.35
T28-Bishomomoretane (ug/g)	64	14	0.00054	0.01533	0.08	0.59
T29-Homohopane (ug/g)	64	59	0.00071	0.00316	-0.36	0.55
T2-C21Diterpane (ug/g)	64	31	0.00041	0.00317	0.03	0.87
T30-C33-Trishomohopane(S) (ug/g)	64	8	0.00051	0.0144	0.06	0.65
T31-C33-Trishomohopane(R) (ug/g)	64	36	0.00087	0.00529	0.09	0.65
T32-Tetrakishomohopane(S) (ug/g)	64	36	0.00096	0.01949	-0.03	0.89
T33-Tetrakishomohopane(R) (ug/g)	64	59	0.00054	0.00395	-0.11	0.86
T34-Pentakishomohopane(S) (ug/g)	64	58	0.00068	0.00199	-0.46	0.35
T35-Pentakishomohopane(R) (ug/g)	64	57	0.0014	0.00459	0.78	0.04
T3-C22Diterpane (ug/g)	64	56	0.00057	0.00137	-0.47	0.24
T4-C23Diterpane (ug/g)	64	26	0.00053	0.00704	-0.28	0.08
T5-C24Diterpane (ug/g)	64	32	0.00039	0.00287	-0.01	0.96
T6a-C24Tetracyclic Terpane (ug/g)	64	46	0.00057	0.00214	0.18	0.47
T6b-C26Tricyclic[S] (ug/g)	64	46	0.00047	0.00636	-0.37	0.14
T6-C25Diterpane (ug/g)	64	34	0.00066	0.0033	0.27	0.15

Table A-10.

Parameter	Sediment					
	Mysid, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
T6c-C26Tricyclic[R] (ug/g)	64	55	0.00066	0.00192	0.64	0.06
T7-C28Tricyclictriterpane[S] (ug/g)	64	59	0.00068	0.00141	-0.67	0.22
T8-C28Tricyclictriterpane[R] (ug/g)	64	55	0.00054	0.00167	-0.22	0.57
T9-C29Tricyclictriterpane(S) (ug/g)	64	56	0.00071	0.00179	0.52	0.19
SHC, Total (ug/g)	64	0	0.14258	7030.13	0.14	0.27
Total PAH (ug/g)	64	0	0.00836	0.51672	0.05	0.70
TPH (Diesel Range) (ug/g)	64	13	0.14678	45384.29	0.17	0.22
TPH, Total (ug/g)	64	8	0.04712	117372.75	0.20	0.13

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-11.

Parameter	Sediment					
	Worm, 10-days					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
Gravel (%)	17	4	0	0	NA	NA
Sand (%)	17	0	1.9	91.4	0.24	0.35
Silt, Clay, Colloids (%)	17	0	8.6	98.1	-0.24	0.35
Solids (%)	10	0	28	81	0.62	0.05
Moisture (%)	108	0	18.3	82.7	-0.26	0.01
Ammonia as N (ug/g)	27	6	0.85	104	-0.42	0.06
Nitrogen (ug/g)	84	0	1.25	1700	-0.03	0.81
Sulfide (Acid Soluble) (ug/g)	92	26	15	833	-0.24	0.05
Total Organic Carbon (ug/g)	111	23	200	196000	-0.03	0.79
Aluminum (ug/g)	111	0	16	31900	-0.17	0.08
Arsenic (ug/g)	111	3	0.16	22.8	-0.24	0.01
Barium (ug/g)	111	3	0.36	471	0.07	0.50
Beryllium (ug/g)	111	32	0.05	1.74	-0.33	0.00
Cadmium (ug/g)	111	62	0.05	1.61	-0.28	0.05
Calcium (ug/g)	111	0	135	71600	-0.28	0.00
Chromium (ug/g)	111	6	0.44	52.9	-0.12	0.24
Cobalt (ug/g)	111	18	0.04	11.2	0.02	0.84
Copper (ug/g)	111	13	0.18	22.2	0.00	1.00
Iron (ug/g)	111	0	32	50500	-0.21	0.02
Lead (ug/g)	111	3	0.17	30.9	-0.09	0.36
Magnesium (ug/g)	111	0	220	13100	-0.18	0.06
Manganese (ug/g)	111	2	0.4	1510	-0.12	0.21
Mercury (ug/g)	111	33	0.0002	0.416	0.02	0.84
Nickel (ug/g)	111	6	0.08	27.6	0.08	0.43
Potassium (ug/g)	111	4	65.2	5340	0.01	0.91
Selenium (ug/g)	111	66	0.2	2.42	-0.20	0.18
Silver (ug/g)	111	90	0.04	0.23	0.10	0.67
Sodium (ug/g)	111	0	250	31200	-0.18	0.06
Strontium (ug/g)	10	0	1.8	150	-0.32	0.37
Thallium (ug/g)	109	53	0.08	2.37	0.00	0.98
Titanium (ug/g)	10	3	1	38	-0.70	0.08
Vanadium (ug/g)	111	6	0.57	77	-0.11	0.28
Yttrium (ug/g)	10	6	0.5	20	-0.60	0.40
Zinc (ug/g)	111	6	0.44	89.4	0.03	0.73
1-Methylnaphthalene (ug/g)	111	107	0.0024	0.0087	-0.80	0.20
2-Methylnaphthalene (ug/g)	111	104	0.003	0.025	-0.46	0.29
Acetone (ug/g)	111	43	0.006	0.83	-0.42	0.00
Anthracene (ug/g)	111	105	0.0033	0.018	-0.23	0.66
Benz(a)anthracene (ug/g)	111	90	0.0029	0.08	-0.26	0.25
Benzene (ug/g)	111	98	0.0006	0.0028	0.03	0.92
Benzo(a)pyrene (ug/g)	111	85	0.0026	0.075	-0.23	0.27
Benzo(b)fluoranthene (ug/g)	111	82	0.0022	0.12	-0.10	0.62
Benzo(e)pyrene (ug/g)	111	97	0.0045	0.06	0.14	0.62
Benzo(g,h,i)perylene (ug/g)	111	95	0.003	0.066	-0.20	0.46
Benzo(k)fluoranthene (ug/g)	111	96	0.005	0.047	-0.16	0.58
Bis(2-ethylhexyl) phthalate (ug/g)	111	23	0.0084	0.51	-0.04	0.73

Table A-11.

Parameter	Sediment Worm, 10-days Survival					Pvalue
	N	ND	Detect Range		Corr	
Butyl benzyl phthalate (ug/g)	111	106	0.0058	0.041	0.15	0.80
C1-Benzanthrene/chrysenes (ug/g)	111	98	0.0051	0.053	-0.22	0.47
C1-Fluoranthrenes/pyrenes (ug/g)	111	91	0.0024	0.062	-0.14	0.54
C1-Fluorenes (ug/g)	111	106	0.0027	0.015	-0.97	0.01
C1-Phenanthrenes/anthracenes (ug/g)	111	98	0.0026	0.04	-0.51	0.08
C2-Benzanthrene/chrysenes (ug/g)	111	101	0.0026	0.052	-0.59	0.07
C2-Fluoranthrenes/pyrenes (ug/g)	111	93	0.0028	0.083	-0.25	0.31
C2-Fluorenes (ug/g)	111	103	0.0039	0.028	-0.14	0.73
C2-Naphthalenes (ug/g)	111	95	0.0028	0.021	0.23	0.38
C2-Phenanthrenes/anthracenes (ug/g)	111	96	0.003	0.08	-0.32	0.24
C3-Benzanthrene/chrysenes (ug/g)	111	103	0.0027	0.053	-0.81	0.02
C3-Fluoranthrenes/pyrenes (ug/g)	111	98	0.0028	0.081	-0.56	0.04
C3-Fluorenes (ug/g)	111	96	0.0034	0.027	-0.35	0.21
C3-Naphthalenes (ug/g)	111	103	0.0026	0.023	-0.43	0.28
C3-Phenanthrenes/anthracenes (ug/g)	111	97	0.003	0.081	-0.31	0.28
C4-Benzanthrene/chrysenes (ug/g)	104	98	0.0043	0.05	-0.94	0.01
C4-Naphthalenes (ug/g)	111	104	0.0036	0.024	-0.76	0.05
C4-Phenanthrenes/anthracenes (ug/g)	107	91	0.0042	0.059	-0.26	0.34
Caprolactam (ug/g)	94	70	0.0054	0.043	-0.44	0.03
Carbon Disulfide (ug/g)	111	53	0.0005	0.079	-0.49	0.00
Chrysene (ug/g)	111	87	0.002	0.18	-0.33	0.12
Dibenz(a,h)anthracene (ug/g)	111	103	0.0023	0.018	-0.35	0.40
Diethyl phthalate (ug/g)	111	107	0.0042	0.0088	-0.80	0.20
Di-n-butyl phthalate (ug/g)	111	96	0.0032	0.091	-0.14	0.61
Di-n-octyl phthalate (ug/g)	111	102	0.0039	0.41	0.32	0.40
Fluoranthene (ug/g)	111	79	0.003	0.16	0.04	0.83
Indeno(1,2,3-cd)pyrene (ug/g)	111	93	0.003	0.083	-0.11	0.66
m,p-Xylenes (ug/g)	94	91	0.0051	0.021	0.50	0.67
Methyl ethyl ketone (ug/g)	111	101	0.006	0.15	0.22	0.55
Naphthalene (ug/g)	111	105	0.0019	0.032	-0.43	0.40
Oil and Grease, HEM (ug/g)	17	3	185	2490	0.27	0.34
Perylene (ug/g)	111	96	0.0028	0.25	-0.12	0.67
Phenanthrene (ug/g)	111	78	0.0025	0.077	-0.08	0.66
Phenol (ug/g)	111	101	0.0044	0.015	0.14	0.71
Pyrene (ug/g)	111	80	0.0024	0.12	0.13	0.50
Toluene (ug/g)	111	101	0.0005	0.0024	0.31	0.38
Xylenes, Total (ug/g)	101	98	0.0051	0.021	0.50	0.67
TPH (Diesel Range) (C10-C28) (ug/g)	17	9	6.34	38.6	-0.24	0.57
TPH (Diesel Range) (ug/g)	94	32	0.63	31	-0.25	0.05
TPH (Gasoline Range) (C6-10) (ug/g)	111	60	0.02	0.3	-0.09	0.51
TPH (Oil Range) (>C28-C40) (ug/g)	94	5	0.78	39	-0.07	0.54
TPH (Oil Range) (C28-C35) (ug/g)	17	7	5.21	37.4	-0.43	0.21

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-12.

Parameter	Surface Water Pacific Oyster, 48-hours Embryo Development					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	10	0	2900	6500	0.00	0.99
Aluminum (ug/l)	10	0	72.9	1470	-0.01	0.99
Antimony (ug/l)	10	1	3	6.5	-0.23	0.56
Arsenic (ug/l)	10	6	1.5	3.2	-0.40	0.60
Barium (ug/l)	10	0	47.4	109	0.02	0.95
Calcium (ug/l)	10	0	53700	262000	0.22	0.53
Chromium (ug/l)	10	7	0.66	2	-0.50	0.67
Iron (ug/l)	10	0	16.2	1020	-0.03	0.93
Lead (ug/l)	10	4	1.9	2.8	0.49	0.32
Magnesium (ug/l)	10	0	33100	779000	0.19	0.59
Manganese (ug/l)	10	0	20.7	111	-0.20	0.58
Mercury (ug/l)	10	7	0.057	0.083	-0.50	0.67
Potassium (ug/l)	10	0	10400	263000	0.02	0.95
Sodium (ug/l)	10	0	172000	6340000	-0.07	0.85
Vanadium (ug/l)	10	0	2.2	6.1	0.05	0.89
Oil and Grease, HEM (ug/l)	10	3	900	2900	0.47	0.28
TPH (Diesel Range) (C10-C28) (ug/l)	10	6	26.8	69.8	-0.40	0.60

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-13.

Parameter	Surface Water					
	Pacific Oyster, 48-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	10	0	2900	6500	0.32	0.37
Aluminum (ug/l)	10	0	72.9	1470	-0.28	0.43
Antimony (ug/l)	10	1	3	6.5	-0.03	0.95
Arsenic (ug/l)	10	6	1.5	3.2	-0.80	0.20
Barium (ug/l)	10	0	47.4	109	0.45	0.19
Calcium (ug/l)	10	0	53700	262000	-0.50	0.14
Chromium (ug/l)	10	7	0.66	2	-1.00	0.00
Iron (ug/l)	10	0	16.2	1020	-0.12	0.75
Lead (ug/l)	10	4	1.9	2.8	0.29	0.58
Magnesium (ug/l)	10	0	33100	779000	-0.48	0.16
Manganese (ug/l)	10	0	20.7	111	0.39	0.26
Mercury (ug/l)	10	7	0.057	0.083	1.00	0.00
Potassium (ug/l)	10	0	10400	263000	-0.55	0.10
Sodium (ug/l)	10	0	172000	6340000	-0.44	0.20
Vanadium (ug/l)	10	0	2.2	6.1	-0.12	0.73
Oil and Grease, HEM (ug/l)	10	3	900	2900	-0.56	0.19
TPH (Diesel Range) (C10-C28) (ug/l)	10	6	26.8	69.8	0.00	1.00

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-14.

Parameter	Surface Water Algae, 96-hours Inhibition					
	N	ND	Detect Range		Corr	Pvalue
Di(propylene glycol) butyl ether (ug/l)	66	20	0.006	1.51392	-0.23	0.12
Dispersant Marker 1 (ug/l)	64	20	0.0032	0.36561	-0.17	0.26
Dispersant Marker 2 (ug/l)	64	20	0.003	0.73271	-0.24	0.12
Acenaphthene (ug/l)	66	59	0.0014	0.00258	0.09	0.85
Acenaphthylene (ug/l)	66	43	0.0006	0.00252	0.39	0.06
Anthracene (ug/l)	66	63	0.0006	0.00094	0.50	0.67
Benz(a)anthracene (ug/l)	66	62	0.0018	0.00184	0.63	0.37
Benzo(e)pyrene (ug/l)	66	62	0.0019	0.0033	0.40	0.60
Benzo(g,h,i)perylene (ug/l)	66	62	0.0006	0.00192	-0.40	0.60
Biphenyl (ug/l)	66	41	0.0007	0.0021	-0.21	0.32
C1-Dibenzothiophenes (ug/l)	66	62	0.0005	0.08326	-0.63	0.37
C1-Naphthalenes (ug/l)	66	29	0.0012	0.00671	-0.03	0.84
C1-Phenanthrenes/anthracenes (ug/l)	66	55	0.0027	0.09766	0.19	0.58
C2-Dibenzothiophenes (ug/l)	66	61	0.0024	0.00451	-0.40	0.50
C2-Naphthalenes (ug/l)	66	51	0.0027	0.0185	0.09	0.75
C2-Phenanthrenes/anthracenes (ug/l)	66	61	0.0034	0.00426	0.10	0.87
C3-Naphthalenes (ug/l)	66	53	0.001	0.02791	-0.29	0.33
C3-Phenanthrenes/anthracenes (ug/l)	66	60	0.0017	0.00686	0.14	0.79
C4-Naphthalenes (ug/l)	66	63	0.0028	0.00947	1.00	0.00
Chrysene (ug/l)	66	61	0.0008	0.00103	0.90	0.04
Dibenzofuran (ug/l)	66	40	0.0005	0.00282	-0.25	0.22
Dibenzothiophene (ug/l)	66	62	0.0006	0.00062	0.00	1.00
Fluoranthene (ug/l)	66	48	0.0006	0.00122	0.41	0.09
Fluorene (ug/l)	66	34	0.001	0.00432	-0.06	0.75
Naphthalene (ug/l)	66	53	0.0017	0.01632	-0.22	0.46
n-Dodcosane (C22) (ug/l)	66	56	0.02	0.18	0.14	0.70
n-Eicosane (C20) (ug/l)	66	61	0.03	0.09	-0.56	0.32
n-Heneicosane (C21) (ug/l)	66	57	0.02	0.1	-0.68	0.04
n-Heptadecane (C17) (ug/l)	66	63	0.1	0.22	0.50	0.67
n-Heptatriacontane (C37) (ug/l)	66	52	0.02	0.5	-0.20	0.49
n-Hexadecane (C16) (ug/l)	66	60	0.25	1.25	-0.03	0.96
n-Hexatriacontane (C36) (ug/l)	66	50	0.03	0.55	-0.20	0.46
n-Nonatriacontane (C39) (ug/l)	66	61	0.04	0.08	0.53	0.36
n-Octatriacontane (C38) (ug/l)	66	58	0.03	0.47	0.39	0.34
n-Pentadecane (C15) (ug/l)	66	59	0.27	1.26	-0.18	0.70
n-Pentatriacontane (C35) (ug/l)	66	57	0.02	0.17	-0.08	0.83
n-Tetracontane (C40) (ug/l)	66	63	0.08	0.36	0.50	0.67
n-Tetracosane (C24) (ug/l)	66	58	0.06	0.44	0.25	0.55
n-Tetratriacontane (C34) (ug/l)	66	60	0.05	0.81	-0.09	0.87
n-Tricosane (C23) (ug/l)	66	52	0.03	0.24	0.04	0.88
Phenanthrene (ug/l)	66	26	0.0009	0.00701	-0.31	0.05
Pyrene (ug/l)	66	38	0.0005	0.00141	0.16	0.42
S12-Cholestane (ug/l)	66	63	0.0041	0.00726	-0.50	0.67
S26-Ethylcholestane(20R) (ug/l)	66	63	0.0045	0.00602	-1.00	0.00
S27-Ethylcholestane(20S) (ug/l)	66	63	0.0031	0.00648	-0.50	0.67

Table A-14.

Parameter	Surface Water Algae, 96-hours Inhibition					
	N	ND	Detect Range		Corr	Pvalue
S28-Ethylcholestane (ug/l)	66	63	0.0026	0.00365	-1.00	0.00
T19-C30 Hopane (ug/l)	66	63	0.0173	0.03044	-1.00	0.00
Toluene (ug/l)	65	61	0.21	1.6	0.80	0.20
SHC, Total (ug/l)	66	25	0.99	27.66	0.09	0.59
Total PAH (ug/l)	66	9	0.0017	0.15404	-0.16	0.22
TPH (Diesel Range) (ug/l)	66	52	0.36	8.93	0.03	0.92
TPH, Total (ug/l)	66	61	0.25	22.54	0.90	0.04

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-15.

Parameter	Surface Water					
	Pink Shrimp, 7-days					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
Di(propylene glycol) butyl ether (ug/l)	87	31	0.0152	1.10456	-0.06	0.65
Dispersant Marker 1 (ug/l)	87	31	0.0032	0.36561	-0.03	0.80
Dispersant Marker 2 (ug/l)	87	31	0.0091	0.73271	-0.08	0.56
Acenaphthene (ug/l)	87	79	0.0014	0.00541	0.34	0.40
Acenaphthylene (ug/l)	87	54	0.0006	0.00252	0.05	0.77
Anthracene (ug/l)	87	82	0.0006	0.00183	0.15	0.80
Benz(a)anthracene (ug/l)	87	77	0.0018	0.00819	0.22	0.54
Benzo(e)pyrene (ug/l)	87	82	0.0019	0.007	-0.41	0.49
Benzo(g,h,i)perylene (ug/l)	87	81	0.0006	0.00497	-0.12	0.82
Biphenyl (ug/l)	87	52	0.0007	0.00306	-0.36	0.03
C1-Dibenzothiophenes (ug/l)	87	83	0.0005	0.08326	-0.77	0.23
C1-Fluorenes (ug/l)	87	83	0.0021	0.0022	0.06	0.94
C1-Naphthalenes (ug/l)	87	35	0.0011	0.01659	-0.08	0.59
C1-Phenanthrenes/anthracenes (ug/l)	87	74	0.0027	0.09766	-0.83	0.00
C2-Dibenzothiophenes (ug/l)	87	83	0.0024	0.00451	0.89	0.11
C2-Naphthalenes (ug/l)	87	68	0.0027	0.02546	-0.62	0.00
C2-Phenanthrenes/anthracenes (ug/l)	87	81	0.0034	0.02778	-0.31	0.55
C3-Naphthalenes (ug/l)	87	71	0.001	0.02502	-0.64	0.01
C3-Phenanthrenes/anthracenes (ug/l)	87	80	0.0017	0.00686	0.90	0.01
C4-Naphthalenes (ug/l)	87	83	0.0028	0.00947	-0.20	0.80
Cholestane (ug/l)	87	84	0.0066	0.01094	0.50	0.67
Chrysene (ug/l)	87	78	0.0008	0.01151	0.17	0.66
Dibenzofuran (ug/l)	87	48	0.0005	0.00599	-0.16	0.32
Dibenzothiophene (ug/l)	87	80	0.0006	0.00133	-0.06	0.90
Fluoranthene (ug/l)	87	64	0.0006	0.03167	0.04	0.86
Fluorene (ug/l)	87	43	0.001	0.00625	-0.03	0.82
Naphthalene (ug/l)	87	72	0.0017	0.02079	0.11	0.69
n-Dodcosane (C22) (ug/l)	87	72	0.02	0.18	0.27	0.34
n-Eicosane (C20) (ug/l)	87	84	0.03	0.09	-1.00	0.00
n-Heneicosane (C21) (ug/l)	87	78	0.02	0.05	-0.05	0.91
n-Heptatriacontane (C37) (ug/l)	87	70	0.02	0.5	-0.23	0.37
n-Hexadecane (C16) (ug/l)	87	82	0.25	1.25	-0.67	0.22
n-Hexatriacontane (C36) (ug/l)	87	73	0.03	0.55	-0.54	0.05
n-Nonatriacontane (C39) (ug/l)	87	82	0.04	0.08	-0.23	0.71
n-Octatriacontane (C38) (ug/l)	87	76	0.03	0.47	0.42	0.20
n-Pentadecane (C15) (ug/l)	87	82	0.27	1.12	-0.22	0.72
n-Pentatriacontane (C35) (ug/l)	87	78	0.02	0.17	-0.17	0.67
n-Tetracosane (C24) (ug/l)	87	76	0.06	0.44	-0.86	0.00
n-Tetratriacontane (C34) (ug/l)	87	80	0.05	0.81	-0.92	0.00
n-Tricosane (C23) (ug/l)	87	64	0.03	0.27	-0.38	0.07
Perylene (ug/l)	87	84	0.0016	0.00268	-0.50	0.67
Phenanthrene (ug/l)	87	33	0.0008	0.02307	-0.26	0.06
Pyrene (ug/l)	87	56	0.0005	0.02594	-0.18	0.35
S12-Cholestane (ug/l)	87	83	0.0041	0.01086	0.32	0.68
S14-CHOLESTANE (20R) (ug/l)	87	84	0.0029	0.00429	0.87	0.33

Table A-15.

Parameter	Surface Water					
	Pink Shrimp, 7-days					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
S15-Cholestane (20S) (ug/l)	87	84	0.0026	0.00462	0.00	1.00
S22-Methylcholestane(20R) (ug/l)	87	84	0.0021	0.0044	0.00	1.00
S23-Methylcholestane(20S) (ug/l)	87	84	0.0022	0.00399	0.00	1.00
S25-Ethylcholestane (ug/l)	87	84	0.0021	0.00464	0.00	1.00
S26-Ethylcholestane(20R) (ug/l)	87	83	0.0045	0.00622	-0.32	0.68
S27-Ethylcholestane(20S) (ug/l)	87	83	0.0031	0.00648	-0.95	0.05
S28-Ethylcholestane (ug/l)	87	83	0.0026	0.00752	-0.32	0.68
T11-Trisnorhopane(TS) (ug/l)	87	84	0.0054	0.01096	0.00	1.00
T12-Trisnorhopane(TM) (ug/l)	87	84	0.0041	0.01269	0.00	1.00
T15-C29-Norhopane (ug/l)	87	84	0.0153	0.02838	0.00	1.00
T16-Norneohopane (ug/l)	87	84	0.004	0.01231	0.00	1.00
T19-C30 Hopane (ug/l)	87	83	0.0173	0.05127	-0.32	0.68
T20-Moretane (ug/l)	87	84	0.0019	0.01169	0.00	1.00
T21-C31-Homohopane(S) (ug/l)	87	84	0.0095	0.01469	0.00	1.00
T22-C31-Homohopane(R) (ug/l)	87	84	0.0073	0.01135	0.00	1.00
Toluene (ug/l)	87	81	1	1.7	NA	NA
SHC, Total (ug/l)	87	34	0.99	27.66	-0.32	0.02
Total PAH (ug/l)	87	10	0.0017	0.17447	-0.10	0.37
TPH (Diesel Range) (ug/l)	87	73	0.47	16.44	0.28	0.33
TPH, Total (ug/l)	87	79	0.25	35.14	-0.41	0.31

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-16.

Parameter	Surface Water					
	Fish, 7-days					
	Biomass					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	20	0	1400	6500	0.01	0.97
Aluminum (ug/l)	20	1	72.9	4730	-0.05	0.84
Antimony (ug/l)	20	8	1.1	7.8	0.24	0.45
Arsenic (ug/l)	20	8	1.5	5.2	0.13	0.70
Barium (ug/l)	20	0	25.1	110	-0.22	0.36
Cadmium (ug/l)	20	14	0.18	0.29	0.09	0.87
Calcium (ug/l)	20	0	46600	359000	0.18	0.46
Chromium (ug/l)	20	12	0.36	5.5	0.04	0.93
Iron (ug/l)	20	1	16.2	4470	-0.03	0.91
Lead (ug/l)	20	9	1.8	7.9	-0.14	0.68
Magnesium (ug/l)	20	0	18500	1280000	0.18	0.45
Manganese (ug/l)	20	0	5.5	177	-0.28	0.23
Mercury (ug/l)	20	16	0.057	0.16	0.20	0.80
Nickel (ug/l)	20	16	1.8	39.5	-0.40	0.60
Potassium (ug/l)	20	0	5950	417000	0.20	0.39
Selenium (ug/l)	20	16	1	3.2	-0.40	0.60
Sodium (ug/l)	20	0	54400	10300000	0.25	0.29
Vanadium (ug/l)	20	0	1.3	13.2	-0.06	0.82
Zinc (ug/l)	20	14	4.6	22.6	-0.23	0.66
Naphthalene (ug/l)	20	17	0.11	0.18	-0.50	0.67
Oil and Grease, HEM (ug/l)	20	9	900	2900	0.11	0.75
TPH (Diesel Range) (C10-C28) (ug/l)	20	13	26.8	148	0.18	0.70

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-17.

Parameter	Surface Water					
	Fish, 7-days					
	Growth					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	20	0	1400	6500	-0.61	0.00
Aluminum (ug/l)	30	7	72.9	4730	0.03	0.91
Antimony (ug/l)	30	18	1.1	7.8	0.17	0.60
Arsenic (ug/l)	30	17	1.5	5.4	0.69	0.01
Barium (ug/l)	30	10	25.1	110	-0.55	0.01
Cadmium (ug/l)	30	24	0.18	0.29	0.03	0.96
Calcium (ug/l)	30	0	46600	360000	0.52	0.00
Chromium (ug/l)	30	22	0.36	5.5	-0.35	0.40
Iron (ug/l)	30	1	16.2	4470	0.42	0.02
Lead (ug/l)	30	19	1.8	7.9	0.19	0.58
Magnesium (ug/l)	30	0	18500	1280000	0.53	0.00
Manganese (ug/l)	30	4	5.5	210	-0.31	0.12
Mercury (ug/l)	30	26	0.057	0.16	0.32	0.68
Nickel (ug/l)	30	18	1.8	39.5	0.43	0.16
Potassium (ug/l)	30	0	5950	417000	0.43	0.02
Selenium (ug/l)	30	25	1	12	0.10	0.87
Sodium (ug/l)	30	0	54400	10300000	0.55	0.00
Strontium (ug/l)	10	0	3800	6700	-0.24	0.50
Vanadium (ug/l)	30	6	1.3	13.2	0.13	0.54
Zinc (ug/l)	30	16	4.6	22.6	-0.24	0.40
Naphthalene (ug/l)	30	27	0.11	0.18	1.00	0.00
Oil and Grease, HEM (ug/l)	20	9	900	2900	0.08	0.82
TPH (Diesel Range) (C10-C28) (ug/l)	20	13	26.8	148	0.72	0.07

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-18.

Parameter	Surface Water					
	Fish, 7-days					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	20	0	1400	6500	0.61	0.00
Aluminum (ug/l)	30	7	72.9	4730	-0.26	0.23
Antimony (ug/l)	30	18	1.1	7.8	-0.17	0.59
Arsenic (ug/l)	30	17	1.5	5.4	-0.49	0.09
Barium (ug/l)	30	10	25.1	110	0.46	0.04
Cadmium (ug/l)	30	24	0.18	0.29	-0.04	0.93
Calcium (ug/l)	30	0	46600	360000	-0.33	0.08
Chromium (ug/l)	30	22	0.36	5.5	0.27	0.52
Iron (ug/l)	30	1	16.2	4470	-0.13	0.49
Lead (ug/l)	30	19	1.8	7.9	-0.54	0.09
Magnesium (ug/l)	30	0	18500	1280000	-0.36	0.05
Manganese (ug/l)	30	4	5.5	210	-0.04	0.84
Mercury (ug/l)	30	26	0.057	0.16	-0.80	0.20
Nickel (ug/l)	30	18	1.8	39.5	-0.12	0.71
Potassium (ug/l)	30	0	5950	417000	-0.36	0.05
Selenium (ug/l)	30	25	1	12	0.37	0.54
Sodium (ug/l)	30	0	54400	10300000	-0.32	0.08
Strontium (ug/l)	10	0	3800	6700	0.23	0.53
Vanadium (ug/l)	30	6	1.3	13.2	0.08	0.71
Zinc (ug/l)	30	16	4.6	22.6	-0.11	0.70
Naphthalene (ug/l)	30	27	0.11	0.18	-1.00	0.00
Oil and Grease, HEM (ug/l)	20	9	900	2900	0.01	0.98
TPH (Diesel Range) (C10-C28) (ug/l)	20	13	26.8	148	-0.57	0.18

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-19.

Parameter	Surface Water Fish, 96-hours Survival					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	20	0	1400	6500	0.49	0.03
Aluminum (ug/l)	30	7	72.9	4730	-0.36	0.09
Antimony (ug/l)	30	18	1.1	7.8	-0.06	0.85
Arsenic (ug/l)	30	17	1.5	5.4	-0.52	0.07
Barium (ug/l)	30	10	25.1	110	0.40	0.08
Cadmium (ug/l)	30	24	0.18	0.29	-0.65	0.16
Calcium (ug/l)	30	0	46600	360000	0.01	0.95
Chromium (ug/l)	30	22	0.36	5.5	-0.28	0.51
Iron (ug/l)	30	1	16.2	4470	0.18	0.36
Lead (ug/l)	30	19	1.8	7.9	-0.42	0.20
Magnesium (ug/l)	30	0	18500	1280000	-0.03	0.86
Manganese (ug/l)	30	4	5.5	210	-0.02	0.92
Mercury (ug/l)	30	26	0.057	0.16	-0.40	0.60
Nickel (ug/l)	30	18	1.8	39.5	0.38	0.22
Potassium (ug/l)	30	0	5950	417000	-0.13	0.49
Selenium (ug/l)	30	25	1	12	0.90	0.04
Sodium (ug/l)	30	0	54400	10300000	0.00	0.98
Strontium (ug/l)	10	0	3800	6700	-0.11	0.75
Vanadium (ug/l)	30	6	1.3	13.2	0.21	0.34
Zinc (ug/l)	30	16	4.6	22.6	-0.04	0.89
Di(propylene glycol) butyl ether (ug/l)	101	42	0.00599	1.51392	-0.07	0.59
Dispersant Marker 1 (ug/l)	89	32	0.00324	0.36561	-0.14	0.28
Dispersant Marker 2 (ug/l)	89	32	0.00304	0.73271	-0.15	0.26
Acenaphthene (ug/l)	121	112	0.0014	0.00541	0.38	0.31
Acenaphthylene (ug/l)	121	88	0.00059	0.00252	0.10	0.58
Anthracene (ug/l)	121	116	0.00059	0.00183	-0.71	0.18
Benz(a)anthracene (ug/l)	121	111	0.00175	0.00819	-0.21	0.57
Benzo(e)pyrene (ug/l)	121	116	0.00189	0.007	-0.67	0.22
Benzo(g,h,i)perylene (ug/l)	121	115	0.00058	0.00497	-0.17	0.75
Biphenyl (ug/l)	101	65	0.00072	0.00306	0.10	0.56
C1-Dibenzothiophenes (ug/l)	91	87	0.00047	0.08326	-0.32	0.68
C1-Fluorenes (ug/l)	121	117	0.00209	0.0022	-0.27	0.73
C1-Naphthalenes (ug/l)	91	38	0.00111	0.01659	-0.02	0.90
C1-Phenanthrenes/anthracenes (ug/l)	121	107	0.00267	0.09766	-0.29	0.32
C2-Dibenzothiophenes (ug/l)	91	86	0.00235	0.00451	-0.63	0.25
C2-Naphthalenes (ug/l)	121	100	0.00267	0.02546	-0.09	0.70
C2-Phenanthrenes/anthracenes (ug/l)	121	115	0.0034	0.02778	-0.62	0.19
C3-Naphthalenes (ug/l)	121	103	0.00096	0.02791	-0.11	0.66
C3-Phenanthrenes/anthracenes (ug/l)	121	114	0.00173	0.00686	-0.11	0.81
C4-Naphthalenes (ug/l)	121	117	0.00282	0.00947	-0.32	0.68
Cholestane (ug/l)	91	88	0.00662	0.01094	-0.87	0.33
Chrysene (ug/l)	121	112	0.00076	0.01151	0.10	0.79
Dibenzofuran (ug/l)	121	80	0.00049	0.00599	-0.11	0.51
Dibenzothiophene (ug/l)	91	84	0.00056	0.00133	-0.38	0.40
Fluoranthene (ug/l)	121	97	0.00055	0.03167	-0.19	0.37
Fluorene (ug/l)	121	75	0.00096	0.00625	0.17	0.25

Table A-19.

Parameter	Surface Water Fish, 96-hours Survival					
	N	ND	Detect Range		Corr	Pvalue
Naphthalene (ug/l)	121	101	0.00168	0.18	-0.09	0.71
n-Dodcosane (C22) (ug/l)	91	75	0.02	0.18	0.49	0.06
n-Eicosane (C20) (ug/l)	91	86	0.03	0.09	-0.23	0.71
n-Heneicosane (C21) (ug/l)	91	81	0.02	0.1	0.03	0.93
n-Heptadecane (C17) (ug/l)	91	88	0.1	0.22	NA	NA
n-Heptatriacontane (C37) (ug/l)	91	72	0.02	0.5	0.36	0.13
n-Hexadecane (C16) (ug/l)	91	85	0.25	1.25	-0.39	0.44
n-Hexatriacontane (C36) (ug/l)	91	74	0.03	0.55	0.20	0.44
n-Nonatriacontane (C39) (ug/l)	91	85	0.04	0.08	-0.87	0.02
n-Octatriacontane (C38) (ug/l)	91	79	0.03	0.47	0.20	0.54
n-Pentadecane (C15) (ug/l)	91	84	0.27	1.26	0.00	1.00
n-Pentatriacontane (C35) (ug/l)	91	81	0.02	0.17	0.19	0.60
n-Tetracontane (C40) (ug/l)	91	88	0.08	0.36	0.00	1.00
n-Tetracosane (C24) (ug/l)	91	79	0.06	0.44	-0.27	0.40
n-Tetratriacontane (C34) (ug/l)	91	84	0.05	0.81	0.16	0.74
n-Tricosane (C23) (ug/l)	91	67	0.03	0.27	0.06	0.77
Oil and Grease, HEM (ug/l)	20	9	900	2900	0.17	0.62
Perylene (ug/l)	121	117	0.00161	0.055	-0.95	0.05
Phenanthrene (ug/l)	121	65	0.00079	0.02307	-0.08	0.58
Pyrene (ug/l)	121	87	0.00053	0.059	0.03	0.86
S12-Cholestane (ug/l)	91	87	0.00411	0.01086	-0.77	0.23
S14-CHOLESTANE (20R) (ug/l)	91	88	0.0029	0.00429	0.00	1.00
S15-Cholestane (20S) (ug/l)	91	88	0.00262	0.00462	-0.87	0.33
S22-Methylcholestane(20R) (ug/l)	91	88	0.00213	0.0044	-0.87	0.33
S23-Methylcholestane(20S) (ug/l)	91	88	0.00217	0.00399	-0.87	0.33
S25-Ethylcholestane (ug/l)	91	88	0.00208	0.00464	-0.87	0.33
S26-Ethylcholestane(20R) (ug/l)	91	87	0.0045	0.00622	-0.77	0.23
S27-Ethylcholestane(20S) (ug/l)	91	87	0.00311	0.00648	-0.26	0.74
S28-Ethylcholestane (ug/l)	91	87	0.00259	0.00752	-0.77	0.23
T11-Trisnorhopane(TS) (ug/l)	91	88	0.00539	0.01096	-0.87	0.33
T12-Trisnorhopane(TM) (ug/l)	91	88	0.00409	0.01269	-0.87	0.33
T15-C29-Norhopane (ug/l)	91	88	0.01533	0.02838	-0.87	0.33
T16-Norneohopane (ug/l)	91	88	0.00402	0.01231	-0.87	0.33
T19-C30 Hopane (ug/l)	91	87	0.01725	0.05127	-0.77	0.23
T20-Moretane (ug/l)	91	88	0.00193	0.01169	-0.87	0.33
T21-C31-Homohopane(S) (ug/l)	91	88	0.00945	0.01469	-0.87	0.33
T22-C31-Homohopane(R) (ug/l)	91	88	0.00731	0.01135	-0.87	0.33
Toluene (ug/l)	120	113	0.21	1.7	-0.30	0.51
SHC, Total (ug/l)	91	34	0.99	27.66	-0.15	0.28
Total PAH (ug/l)	91	11	0.00168	0.17447	-0.03	0.81
TPH (Diesel Range) (C10-C28) (ug/l)	20	13	26.8	148	-0.58	0.18
TPH (Diesel Range) (ug/l)	101	83	0.36	16.44	-0.45	0.06
TPH, Total (ug/l)	91	82	0.25	35.14	0.43	0.25

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-20.

Parameter	Surface Water					Pvalue
	Mysid, 7-days					
	N	ND	Detect Range		Corr	
Total Organic Carbon (ug/l)	20	0	1400	6500	0.43	0.06
Aluminum (ug/l)	20	1	72.9	4730	0.05	0.82
Antimony (ug/l)	20	8	1.1	7.8	-0.36	0.25
Arsenic (ug/l)	20	8	1.5	5.2	-0.09	0.77
Barium (ug/l)	20	0	25.1	110	0.45	0.04
Cadmium (ug/l)	20	14	0.18	0.29	0.44	0.38
Calcium (ug/l)	20	0	46600	359000	-0.51	0.02
Chromium (ug/l)	20	12	0.36	5.5	0.50	0.20
Iron (ug/l)	20	1	16.2	4470	0.24	0.33
Lead (ug/l)	20	9	1.8	7.9	0.22	0.52
Magnesium (ug/l)	20	0	18500	1280000	-0.51	0.02
Manganese (ug/l)	20	0	5.5	177	0.14	0.56
Mercury (ug/l)	20	16	0.057	0.16	0.40	0.60
Nickel (ug/l)	20	16	1.8	39.5	-0.80	0.20
Potassium (ug/l)	20	0	5950	417000	-0.50	0.02
Selenium (ug/l)	20	16	1	3.2	0.80	0.20
Sodium (ug/l)	20	0	54400	10300000	-0.48	0.03
Vanadium (ug/l)	20	0	1.3	13.2	0.21	0.36
Zinc (ug/l)	20	14	4.6	22.6	-0.60	0.21
Naphthalene (ug/l)	20	17	0.11	0.18	-1.00	0.00
Oil and Grease, HEM (ug/l)	20	9	900	2900	-0.56	0.07
TPH (Diesel Range) (C10-C28) (ug/l)	20	13	26.8	148	-0.41	0.36

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-21.

Parameter	Surface Water Mysid, 7-days Fecundity					
	N	ND	Detect Range		Corr	Pvalue
	Aluminum (ug/l)	10	6	190	750	-0.20
Calcium (ug/l)	10	0	210000	360000	-0.44	0.20
Iron (ug/l)	10	0	630	1400	0.15	0.69
Magnesium (ug/l)	10	0	650000	1100000	-0.53	0.12
Manganese (ug/l)	10	4	15	210	-0.49	0.33
Nickel (ug/l)	10	2	5.2	31	-0.29	0.49
Potassium (ug/l)	10	0	200000	370000	-0.44	0.21
Sodium (ug/l)	10	0	5100000	9200000	-0.44	0.20
Strontium (ug/l)	10	0	3800	6700	-0.40	0.25
Vanadium (ug/l)	10	6	6.1	9.3	-0.80	0.20
Zinc (ug/l)	10	2	10	14	0.00	1.00

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-22.

Parameter	Surface Water Mysid, 7-days Growth					
	N	ND	Detect Range		Corr	Pvalue
	Total Organic Carbon (ug/l)	20	0	1400	6500	0.52
Aluminum (ug/l)	30	7	72.9	4730	-0.05	0.82
Antimony (ug/l)	30	18	1.1	7.8	-0.33	0.30
Arsenic (ug/l)	30	17	1.5	5.4	0.14	0.65
Barium (ug/l)	30	10	25.1	110	0.44	0.05
Cadmium (ug/l)	30	24	0.18	0.29	0.29	0.58
Calcium (ug/l)	30	0	46600	360000	0.10	0.61
Chromium (ug/l)	30	22	0.36	5.5	0.48	0.23
Iron (ug/l)	30	1	16.2	4470	0.47	0.01
Lead (ug/l)	30	19	1.8	7.9	0.20	0.56
Magnesium (ug/l)	30	0	18500	1280000	0.05	0.78
Manganese (ug/l)	30	4	5.5	210	-0.03	0.87
Mercury (ug/l)	30	26	0.057	0.16	-0.21	0.79
Nickel (ug/l)	30	18	1.8	39.5	0.30	0.35
Potassium (ug/l)	30	0	5950	417000	-0.05	0.79
Selenium (ug/l)	30	25	1	12	0.90	0.04
Sodium (ug/l)	30	0	54400	10300000	0.10	0.60
Strontium (ug/l)	10	0	3800	6700	0.28	0.44
Vanadium (ug/l)	30	6	1.3	13.2	0.51	0.01
Zinc (ug/l)	30	16	4.6	22.6	-0.08	0.78
Naphthalene (ug/l)	30	27	0.11	0.18	-1.00	0.00
Oil and Grease, HEM (ug/l)	20	9	900	2900	-0.32	0.34
TPH (Diesel Range) (C10-C28) (ug/l)	20	13	26.8	148	-0.36	0.43

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-23.

Parameter	Surface Water					
	Mysid, 7-days					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	20	0	1400	6500	-0.26	0.26
Aluminum (ug/l)	30	7	72.9	4730	0.30	0.17
Antimony (ug/l)	30	18	1.1	7.8	-0.10	0.76
Arsenic (ug/l)	30	17	1.5	5.4	0.16	0.60
Barium (ug/l)	30	10	25.1	110	-0.04	0.88
Cadmium (ug/l)	30	24	0.18	0.29	0.63	0.18
Calcium (ug/l)	30	0	46600	360000	-0.18	0.34
Chromium (ug/l)	30	22	0.36	5.5	0.70	0.05
Iron (ug/l)	30	1	16.2	4470	0.19	0.33
Lead (ug/l)	30	19	1.8	7.9	0.44	0.17
Magnesium (ug/l)	30	0	18500	1280000	-0.15	0.42
Manganese (ug/l)	30	4	5.5	210	-0.14	0.50
Mercury (ug/l)	30	26	0.057	0.16	0.21	0.79
Nickel (ug/l)	30	18	1.8	39.5	-0.64	0.02
Potassium (ug/l)	30	0	5950	417000	-0.17	0.36
Selenium (ug/l)	30	25	1	12	-0.53	0.36
Sodium (ug/l)	30	0	54400	10300000	-0.18	0.35
Strontium (ug/l)	10	0	3800	6700	-0.28	0.44
Vanadium (ug/l)	30	6	1.3	13.2	0.00	0.99
Zinc (ug/l)	30	16	4.6	22.6	-0.52	0.05
Naphthalene (ug/l)	30	27	0.11	0.18	-0.50	0.67
Oil and Grease, HEM (ug/l)	20	9	900	2900	-0.45	0.16
TPH (Diesel Range) (C10-C28) (ug/l)	20	13	26.8	148	-0.34	0.46

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-24.

Parameter	Surface Water					
	Mysid, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	20	0	1400	6500	-0.38	0.10
Aluminum (ug/l)	30	7	72.9	4730	0.37	0.08
Antimony (ug/l)	30	18	1.1	7.8	0.16	0.61
Arsenic (ug/l)	30	17	1.5	5.4	0.47	0.10
Barium (ug/l)	30	10	25.1	110	0.03	0.91
Cadmium (ug/l)	30	24	0.18	0.29	0.95	0.00
Calcium (ug/l)	30	0	46600	360000	-0.04	0.84
Chromium (ug/l)	30	22	0.36	5.5	0.62	0.10
Iron (ug/l)	30	1	16.2	4470	0.24	0.21
Lead (ug/l)	30	19	1.8	7.9	0.33	0.32
Magnesium (ug/l)	30	0	18500	1280000	-0.04	0.85
Manganese (ug/l)	30	4	5.5	210	-0.06	0.79
Mercury (ug/l)	30	26	0.057	0.16	0.80	0.20
Nickel (ug/l)	30	18	1.8	39.5	-0.22	0.49
Potassium (ug/l)	30	0	5950	417000	-0.10	0.60
Selenium (ug/l)	30	25	1	12	0.56	0.32
Sodium (ug/l)	30	0	54400	10300000	-0.03	0.86
Strontium (ug/l)	10	0	3800	6700	-0.05	0.90
Vanadium (ug/l)	30	6	1.3	13.2	0.14	0.52
Zinc (ug/l)	30	16	4.6	22.6	-0.44	0.12
2,6,10 Trimethyldodecane (1380) (ug/l)	60	55	0.34	0.71	-0.73	0.16
A2-C21-TAS (ug/l)	60	57	0.0041	0.0052	0.87	0.33
Anthracene (ug/l)	90	87	0.034	0.061	0.00	1.00
Benz(a)anthracene (ug/l)	90	86	0.042	0.16	-0.71	0.29
Benzo(a)pyrene (ug/l)	90	86	0.032	0.11	-0.89	0.11
Benzo(b)fluoranthene (ug/l)	90	86	0.04	0.12	-0.89	0.11
Benzo(e)pyrene (ug/l)	90	87	0.028	0.072	-0.87	0.33
Benzo(g,h,i)perylene (ug/l)	90	87	0.038	0.06	0.87	0.33
Benzo(k)fluoranthene (ug/l)	90	86	0.038	0.11	-0.89	0.11
Cholestane (ug/l)	60	57	0.0029	0.0096	NA	NA
Chrysene (ug/l)	90	86	0.066	0.16	-0.45	0.55
Fluoranthene (ug/l)	90	87	0.06	0.26	-0.87	0.33
Fluorene (ug/l)	90	87	0.021	0.051	0.87	0.33
Indeno(1,2,3-cd)pyrene (ug/l)	90	85	0.023	0.082	-0.58	0.31
Naphthalene (ug/l)	90	79	0.023	0.18	-0.48	0.14
n-Decane (C10) (ug/l)	60	57	0.4	1	-0.50	0.67
n-Dotriacontane (C32) (ug/l)	60	50	0.32	2.9	0.41	0.24
n-Hentriacontane (C31) (ug/l)	60	43	0.33	4.1	0.07	0.78
n-Heptacosane (C27) (ug/l)	60	48	0.33	4.2	-0.13	0.70
n-Heptadecane (C17) (ug/l)	60	41	0.31	2.9	0.05	0.83
n-Heptatriacontane (C37) (ug/l)	60	55	0.32	0.4	NA	NA
n-Hexacosane (C26) (ug/l)	60	48	0.34	4.2	-0.22	0.49
n-Hexadecane (C16) (ug/l)	60	52	0.33	1.4	-0.20	0.63
n-Hexatriacontane (C36) (ug/l)	60	55	0.31	0.98	NA	NA
n-Nonacosane (C29) (ug/l)	60	48	0.32	4.2	-0.05	0.88

Table A-24.

Parameter	Surface Water					
	Mysid, 96-hours					
	Survival					
	N	ND	Detect Range		Corr	Pvalue
n-Nonatriacontane (C39) (ug/l)	60	46	0.29	5.4	-0.59	0.03
n-Octacosane (C28) (ug/l)	60	48	0.31	4.5	-0.30	0.34
n-Octatriacontane (C38) (ug/l)	60	57	0.33	0.41	NA	NA
Norpristane (1650) (ug/l)	60	55	0.31	0.93	0.35	0.56
n-Pentacosane (C25) (ug/l)	60	47	0.32	3.3	0.41	0.16
n-Pentadecane (C15) (ug/l)	60	37	0.31	1.9	0.03	0.89
n-Pentatriacontane (C35) (ug/l)	60	50	0.34	3.6	0.25	0.48
n-Tetracosane (C24) (ug/l)	60	53	0.34	2.3	0.54	0.21
n-Tetradecane (C14) (ug/l)	60	55	0.31	0.39	-0.21	0.74
n-Tetratriacontane (C34) (ug/l)	60	52	0.37	1.4	0.46	0.25
n-Tricontane (C30) (ug/l)	60	52	0.45	4.4	0.21	0.62
n-Tricosane (C23) (ug/l)	60	50	0.39	1.7	0.17	0.65
n-Tridecane (C13) (ug/l)	60	57	0.5	0.66	-1.00	0.00
n-Tritriacontane (C33) (ug/l)	60	52	0.36	2.1	0.49	0.21
Oil and Grease, HEM (ug/l)	20	9	900	2900	-0.33	0.32
Perylene (ug/l)	90	87	0.02	0.055	0.87	0.33
Phenanthrene (ug/l)	90	87	0.064	0.084	0.00	1.00
Phytane (ug/l)	60	57	0.56	2.2	-0.87	0.33
Pyrene (ug/l)	90	85	0.02	0.24	-0.45	0.45
S11-Methyldiacholestane (ug/l)	60	53	0.0028	0.016	0.35	0.45
S12-Cholestane (ug/l)	60	56	0.003	0.0056	-0.26	0.74
S14-CHOLESTANE (20R) (ug/l)	60	57	0.0022	0.003	NA	NA
S22-Methylcholestane(20R) (ug/l)	60	57	0.0029	0.0039	NA	NA
S23-Methylcholestane(20S) (ug/l)	60	57	0.0028	0.0037	NA	NA
S26-Ethylcholestane(20R) (ug/l)	60	56	0.0051	0.0075	0.26	0.74
S27-Ethylcholestane(20S) (ug/l)	60	56	0.0031	0.008	0.26	0.74
S28-Ethylcholestane (ug/l)	60	54	0.0031	0.012	0.62	0.19
T11-Trisnorhopane(TS) (ug/l)	60	57	0.0028	0.0047	0.87	0.33
T12-Trisnorhopane(TM) (ug/l)	60	57	0.0021	0.0059	0.00	1.00
T15-C29-Norhopane (ug/l)	60	55	0.0029	0.019	0.00	1.00
T16-Norneohopane (ug/l)	60	56	0.0025	0.0067	0.26	0.74
T19-C30 Hopane (ug/l)	60	56	0.0028	0.032	0.00	1.00
T21-C31-Homohopane(S) (ug/l)	60	56	0.0063	0.012	0.27	0.73
T22-C31-Homohopane(R) (ug/l)	60	56	0.0055	0.011	0.26	0.74
T23-Homohopane (ug/l)	60	57	0.0034	0.0055	0.87	0.33
T26-C32-Bishomohopane(S) (ug/l)	60	56	0.0037	0.01	0.26	0.74
T27-C32-Bishomohopane(R) (ug/l)	60	57	0.0043	0.006	0.87	0.33
T30-C33-Trishomohopane(S) (ug/l)	60	57	0.0046	0.0078	0.87	0.33
T31-C33-Trishomohopane(R) (ug/l)	60	57	0.0033	0.0049	0.00	1.00
T32-Tetrakishomohopane(S) (ug/l)	60	56	0.0028	0.032	-0.32	0.68
T33-Tetrakishomohopane(R) (ug/l)	60	57	0.0022	0.0074	-0.50	0.67
T34-Pentakishomohopane(S) (ug/l)	60	57	0.0048	0.0096	0.87	0.33
T9-C29Tricyclitriterpane(S) (ug/l)	60	57	0.0024	0.0081	-0.87	0.33
Aromatics, Total (ug/l)	60	46	0.021	1.8	-0.20	0.50
SHC, Total (ug/l)	60	13	0.62	38	0.08	0.60

Table A-24.

Parameter	Surface Water Mysid, 96-hours Survival					
	N	ND	Detect Range		Corr	Pvalue
SHC, Total Resolved (C9-C40) (ug/l)	60	53	51	75	0.37	0.41
TPH (Diesel Range) (C10-C28) (ug/l)	80	57	26.8	148	-0.29	0.18
TPH, Total (C9-C40) (ug/l)	60	33	52	440	-0.34	0.09

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-25.

Parameter	Surface Water					
	Mussel, 48-hours					
	Embryo Development					
	N	ND	Detect Range		Corr	Pvalue
Total Organic Carbon (ug/l)	10	0	1400	4700	-0.13	0.71
Aluminum (ug/l)	10	1	111	4730	0.63	0.07
Antimony (ug/l)	10	7	1.1	7.8	-0.50	0.67
Arsenic (ug/l)	10	2	2.2	5.2	0.44	0.27
Barium (ug/l)	10	0	25.1	110	0.15	0.68
Cadmium (ug/l)	10	6	0.23	0.29	0.80	0.20
Calcium (ug/l)	10	0	46600	359000	-0.16	0.65
Chromium (ug/l)	10	5	0.36	5.5	0.80	0.10
Iron (ug/l)	10	1	26.1	4470	0.78	0.01
Lead (ug/l)	10	5	1.8	7.9	0.90	0.04
Magnesium (ug/l)	10	0	18500	1280000	-0.14	0.70
Manganese (ug/l)	10	0	5.5	177	0.65	0.04
Nickel (ug/l)	10	7	3.6	39.5	-1.00	0.00
Potassium (ug/l)	10	0	5950	417000	-0.16	0.65
Sodium (ug/l)	10	0	54400	10300000	-0.24	0.51
Vanadium (ug/l)	10	0	1.3	13.2	0.45	0.19
Zinc (ug/l)	10	5	8.6	22.6	0.10	0.87
Oil and Grease, HEM (ug/l)	10	6	1000	1200	-0.63	0.37
TPH (Diesel Range) (C10-C28) (ug/l)	10	7	30.6	148	0.50	0.67

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-26.

Parameter	Surface Water Mussel, 48-hours Survival					
	N	ND	Detect Range		Corr	Pvalue
	Total Organic Carbon (ug/l)	10	0	1400	4700	0.23
Aluminum (ug/l)	10	1	111	4730	-0.33	0.38
Antimony (ug/l)	10	7	1.1	7.8	-0.50	0.67
Arsenic (ug/l)	10	2	2.2	5.2	0.61	0.11
Barium (ug/l)	10	0	25.1	110	-0.19	0.60
Cadmium (ug/l)	10	6	0.23	0.29	0.40	0.60
Calcium (ug/l)	10	0	46600	359000	0.24	0.51
Chromium (ug/l)	10	5	0.36	5.5	-0.50	0.39
Iron (ug/l)	10	1	26.1	4470	-0.28	0.46
Lead (ug/l)	10	5	1.8	7.9	0.30	0.62
Magnesium (ug/l)	10	0	18500	1280000	0.20	0.58
Manganese (ug/l)	10	0	5.5	177	-0.66	0.04
Nickel (ug/l)	10	7	3.6	39.5	0.50	0.67
Potassium (ug/l)	10	0	5950	417000	0.24	0.51
Sodium (ug/l)	10	0	54400	10300000	0.36	0.31
Vanadium (ug/l)	10	0	1.3	13.2	-0.45	0.19
Zinc (ug/l)	10	5	8.6	22.6	-0.20	0.75
Oil and Grease, HEM (ug/l)	10	6	1000	1200	-0.63	0.37
TPH (Diesel Range) (C10-C28) (ug/l)	10	7	30.6	148	1.00	0.00

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-27.

Parameter	Surface Water					
	Diatom, 96-hours					
	Inhibition					
	N	ND	Detect Range		Corr	Pvalue
Di(propylene glycol) butyl ether (ug/l)	66	20	0.006	1.51392	-0.18	0.22
Dispersant Marker 1 (ug/l)	64	20	0.0032	0.36561	-0.13	0.42
Dispersant Marker 2 (ug/l)	64	20	0.003	0.73271	-0.10	0.51
Acenaphthene (ug/l)	66	59	0.0014	0.00258	-0.58	0.18
Acenaphthylene (ug/l)	66	43	0.0006	0.00252	0.00	1.00
Anthracene (ug/l)	66	63	0.0006	0.00094	1.00	0.00
Benz(a)anthracene (ug/l)	66	62	0.0018	0.00184	0.95	0.05
Benzo(e)pyrene (ug/l)	66	62	0.0019	0.0033	0.60	0.40
Benzo(g,h,i)perylene (ug/l)	66	62	0.0006	0.00192	-0.40	0.60
Biphenyl (ug/l)	66	41	0.0007	0.0021	-0.36	0.08
C1-Dibenzothiophenes (ug/l)	66	62	0.0005	0.08326	-0.80	0.20
C1-Naphthalenes (ug/l)	66	29	0.0012	0.00671	-0.02	0.88
C1-Phenanthrenes/anthracenes (ug/l)	66	55	0.0027	0.09766	0.23	0.49
C2-Dibenzothiophenes (ug/l)	66	61	0.0024	0.00451	-0.30	0.62
C2-Naphthalenes (ug/l)	66	51	0.0027	0.0185	-0.26	0.34
C2-Phenanthrenes/anthracenes (ug/l)	66	61	0.0034	0.00426	0.00	1.00
C3-Naphthalenes (ug/l)	66	53	0.001	0.02791	-0.34	0.26
C3-Phenanthrenes/anthracenes (ug/l)	66	60	0.0017	0.00686	-0.31	0.54
C4-Naphthalenes (ug/l)	66	63	0.0028	0.00947	-0.50	0.67
Chrysene (ug/l)	66	61	0.0008	0.00103	0.40	0.50
Dibenzofuran (ug/l)	66	40	0.0005	0.00282	-0.29	0.15
Dibenzothiophene (ug/l)	66	62	0.0006	0.00062	0.00	1.00
Fluoranthene (ug/l)	66	48	0.0006	0.00122	0.41	0.10
Fluorene (ug/l)	66	34	0.001	0.00432	0.10	0.57
Naphthalene (ug/l)	66	53	0.0017	0.01632	-0.10	0.75
n-Dodcosane (C22) (ug/l)	66	56	0.02	0.18	0.57	0.09
n-Eicosane (C20) (ug/l)	66	61	0.03	0.09	-0.10	0.87
n-Heneicosane (C21) (ug/l)	66	57	0.02	0.1	0.54	0.13
n-Heptadecane (C17) (ug/l)	66	63	0.1	0.22	1.00	0.00
n-Heptatriacontane (C37) (ug/l)	66	52	0.02	0.5	0.14	0.63
n-Hexadecane (C16) (ug/l)	66	60	0.25	1.25	-0.75	0.08
n-Hexatriacontane (C36) (ug/l)	66	50	0.03	0.55	0.06	0.81
n-Nonatriacontane (C39) (ug/l)	66	61	0.04	0.08	0.63	0.25
n-Octatriacontane (C38) (ug/l)	66	58	0.03	0.47	0.63	0.10
n-Pentadecane (C15) (ug/l)	66	59	0.27	1.26	-0.54	0.22
n-Pentatriacontane (C35) (ug/l)	66	57	0.02	0.17	-0.05	0.90
n-Tetracontane (C40) (ug/l)	66	63	0.08	0.36	1.00	0.00
n-Tetracosane (C24) (ug/l)	66	58	0.06	0.44	-0.76	0.03
n-Tetratriacontane (C34) (ug/l)	66	60	0.05	0.81	-0.43	0.40
n-Tricosane (C23) (ug/l)	66	52	0.03	0.24	0.43	0.13
Phenanthrene (ug/l)	66	26	0.0009	0.00701	-0.18	0.26
Pyrene (ug/l)	66	38	0.0005	0.00141	0.19	0.33
S12-Cholestane (ug/l)	66	63	0.0041	0.00726	-1.00	0.00
S26-Ethylcholestane(20R) (ug/l)	66	63	0.0045	0.00602	-0.50	0.67
S27-Ethylcholestane(20S) (ug/l)	66	63	0.0031	0.00648	0.50	0.67

Table A-27.

Parameter	Surface Water Diatom, 96-hours Inhibition					
	N	ND	Detect Range		Corr	Pvalue
S28-Ethylcholestane (ug/l)	66	63	0.0026	0.00365	-0.50	0.67
T19-C30 Hopane (ug/l)	66	63	0.0173	0.03044	-0.50	0.67
Toluene (ug/l)	65	61	0.21	1.6	0.20	0.80
SHC, Total (ug/l)	66	25	0.99	27.66	-0.06	0.70
Total PAH (ug/l)	66	9	0.0017	0.15404	-0.18	0.18
TPH (Diesel Range) (ug/l)	66	52	0.36	8.93	-0.04	0.89
TPH, Total (ug/l)	66	61	0.25	22.54	-0.10	0.87

Note: Only parameters with more than 2 detected results are shown.

N is the number of results; ND is the number of results that were below the level of detection.

Detect range indicates the minimum and maximum detected concentrations.

Table A-28.

Parameter	Sample Type	
	Sediment	Water
1,1,1,2-Tetrachloroethane	X	X
1,1,1-Trichloroethane	X	X
1,1,2,2-Tetrachloroethane	X	X
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 113)	X	X
1,1,2-Trichloroethane	X	X
1,1-Dichloroethane	X	X
1,1-Dichloroethene (1,1-Dichloroethylene)	X	X
1,1-Dichloropropene	X	X
1,2,3-Trichlorobenzene	X	X
1,2,3-Trichloropropane	X	X
1,2,4,5-Tetrachlorobenzene	X	
1,2,4-Trichlorobenzene	X	X
1,2,4-Trimethylbenzene	X	X
1,2-Dibromo-3-Chloropropane (DBCP)	X	X
1,2-Dibromoethane (EDB)	X	X
1,2-Dichloroethane	X	X
1,2-Dichloropropane	X	X
1,3,5-Trimethylbenzene	X	X
1,3-Dichloropropane	X	X
1,4-Dioxane	X	
1-Methylnaphthalene		X
1-Methylphenanthrene	X	
2,2,4,5,6,7,8,8-Octachloro-2,3,3a,4,7,7a-hexahydro-4,7-metha	X	X
2,2-Dichloropropane	X	X
2,3,4,6-Tetrachlorophenol	X	X
2,4,5-Trichlorophenol	X	X
2,4,6-Trichlorophenol	X	X
2,4-Dichlorophenol	X	X
2,4-Dimethylphenol	X	X
2,4-Dinitrophenol	X	X
2,4-Dinitrotoluene	X	X
2,6-Dimethylnaphthalene	X	
2,6-Dinitrotoluene	X	X
2-Butoxyethanol	X	X
2-Chloronaphthalene	X	X
2-Chlorophenol	X	X
2-Ethyl hexanol	X	X
2-Hexanone	X	X
2-Methylnaphthalene		X
2-Methylnaphthalene-d10	X	X
2-Methylphenol	X	X
2-Naphthalenamine	X	
2-Nitroaniline	X	X
2-Nitrophenol	X	X
3 & 4 Methylphenol		X
3,3'-Dichlorobenzidine	X	X
3-Nitroaniline	X	X

Table A-28.

Parameter	Sample Type	
	Sediment	Water
4,4'-DDD (p,p'-DDD)	X	X
4,4'-DDE (p,p'-DDE)	X	X
4,4'-DDT (p,p'-DDT)	X	X
4,6-Dinitro-o-cresol	X	X
4-Bromophenyl phenyl ether	X	X
4-Chloro-3-methyl phenol	X	X
4-Chloroaniline	X	X
4-Chlorophenyl phenyl ether	X	X
4-Nitroaniline	X	X
4-Nitrophenol	X	X
Acetophenone	X	X
Aldrin	X	X
alpha-BHC	X	X
alpha-Chlordane	X	X
Atrazine	X	X
Benzaldehyde		X
Benzoic acid	X	X
Benzyl alcohol	X	X
beta-BHC	X	X
Bis(2-chloroethoxy)methane	X	X
Bis(2-chloroethyl) ether	X	X
Bis(2-chloroisopropyl) ether	X	X
Bromobenzene	X	X
Bromochloromethane	X	X
Bromoform (Tribromomethane)	X	X
Bromomethane	X	X
Butyl benzyl phthalate		X
C1-Naphthobenzothiophenes		X
C2-Naphthobenzothiophenes		X
C3-Naphthobenzothiophenes		X
Caprolactam		X
Carbazole		X
Carbon Disulfide		X
Carbon Tetrachloride	X	X
Chlorobenzene		X
Chlorodibromomethane	X	X
Chloroethane	X	X
Chloroform		X
Chloromethane		X
cis-1,2-Dichloroethene	X	X
cis-1,3-Dichloropropene	X	X
Cyclohexane		X
delta-Hexachlorocyclohexane (delta-HCH)	X	X
Di-(2-ethylhexyl) sodium sulfosuccinate		X
Dibromomethane	X	X
Dichlorobromomethane	X	X
Dichlorodifluoromethane (Freon 12)	X	X

Table A-28.

Parameter	Sample Type	
	Sediment	Water
Dieldrin	X	X
Diethyl phthalate		X
Dimethyl phthalate	X	X
Di-n-butyl phthalate		X
Di-n-octyl phthalate		X
Dispersant Marker 1	X	
Dispersant Marker 2	X	
Endosulfan I (alpha)	X	X
Endosulfan II (beta)	X	X
Endosulfan Sulfate	X	X
Endrin	X	X
Endrin aldehyde	X	X
Endrin ketone	X	X
gamma-BHC (Lindane)	X	X
gamma-Chlordane		X
Heptachlor	X	X
Heptachlor epoxide	X	X
Hexachlorobenzene (HCB)	X	X
Hexachlorobutadiene	X	X
Hexachlorocyclopentadiene (HCCP)	X	X
Hexachloroethane	X	X
Isophorone	X	X
Isopropylbenzene (Cumene)		X
m,p-Xylenes		X
m-Dichlorobenzene	X	X
Methoxychlor	X	X
Methyl Acetate	X	X
Methyl ethyl ketone		X
Methyl Isobutyl Ketone		X
Methyl tert-butyl ether	X	X
Methylcyclohexane		X
Methylene Chloride		X
Molybdenum		X
Naphthobenzothiophene		X
n-Butylbenzene	X	X
n-Hexatriacontane (C36)	X	
Nitrate/Nitrite as N	X	
Nitrobenzene	X	X
N-Nitroso-di-n-propylamine	X	X
n-Nitrosodiphenylamine	X	X
n-Nitrosodiphenylamine/Diphenylamine	X	X
o-Chlorotoluene	X	X
o-Dichlorobenzene	X	X
o-Xylene	X	
PCB-1016 (Aroclor 1016)	X	X
PCB-1221 (Aroclor 1221)	X	X
PCB-1232 (Aroclor 1232)	X	X

Table A-28.

Parameter	Sample Type	
	Sediment	Water
PCB-1242 (Aroclor 1242)	X	X
PCB-1248 (Aroclor 1248)	X	X
PCB-1254 (Aroclor 1254)	X	X
PCB-1260 (Aroclor 1260)	X	X
PCB-1262 (Aroclor 1262)	X	X
PCB-1268 (Aroclor 1268)	X	X
p-Chlorotoluene	X	X
p-Cymene	X	X
p-Dichlorobenzene	X	X
Pentachlorophenol		X
Petroleum Product	X	
Phenol		X
Propylbenzene	X	X
Propylene Glycol		X
S2-Pregnane	X	
sec-Butylbenzene	X	X
Styrene	X	X
T0-C19Diterpane		X
T13a-29,30-Bisnorhopane		X
T13-Trisnorhopane		X
T28-Bishomomoretane		X
tert-Butylbenzene	X	X
Tetrachloroethene (Tetrachloroethylene)	X	X
Tin		X
Titanium		X
Toxaphene	X	X
TPH (Diesel Range)		X
TPH (Gasoline Range) (C6-10)		X
TPH (Oil Range) (>C28-C40)		X
trans-1,2-Dichloroethylene	X	X
trans-1,3-Dichloropropene	X	X
Trichloroethene (Trichloroethylene)	X	X
Trichlorofluoromethane (Freon 11)	X	X
Uranium-234 and/or uranium-235 and/or uranium-238	X	
Vinyl Chloride	X	X
Yttrium		X

Appendix B: Distribution Plots of Toxicity Test Endpoints with TPAH and EPA's Chronic Aquatic Benchmark for PAHs

Appendix B includes plots of each toxicity endpoint for all laboratory toxicity tests related to total polycyclic aromatic hydrocarbon (TPAH) concentrations and EPA's chronic aquatic life ratio for PAHs, respectively, measured for samples collected after 3 August 2010. Toxicity tests and measured endpoints are ordered within the Appendix as follows:

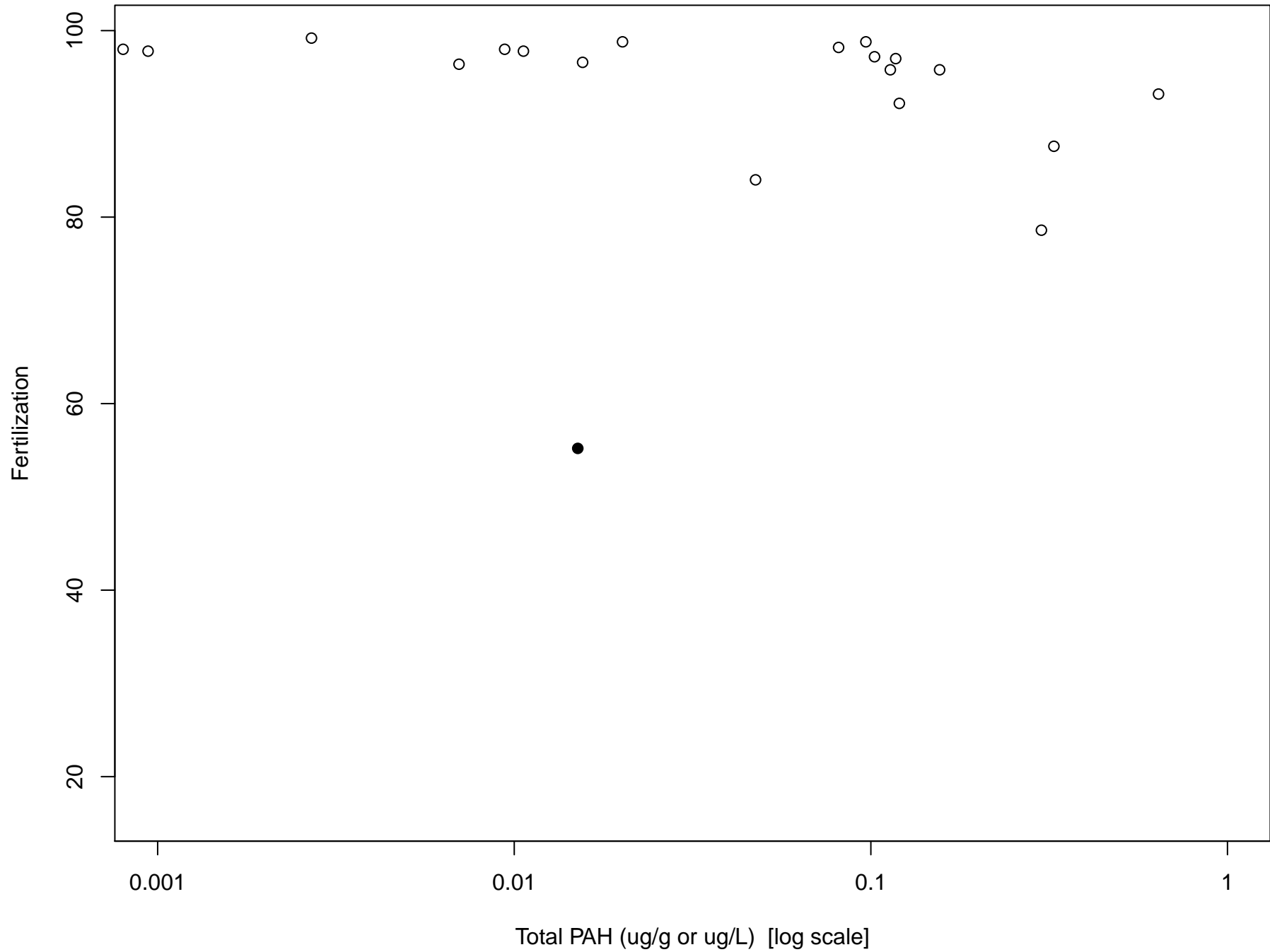
Sediment		
	Sea Urchin, 48 hrs	Fertilization
	Sea Urchin, 48 hrs	Percent Normal
	Amphipod, 10 days	Growth
	Amphipod, 10 days	Reburial
	Amphipod, 10 days	Survival
	Amphipod, 96 hrs	Growth
	Amphipod, 96 hrs	Percent Survival
	Mysid, 48 hrs	Percent Survival
	Mysid, 96 hrs	Growth
	Mysid, 96 hrs	Percent Survival
	Worm, 10 days	Percent Survival
Water		
	Sea Urchin, 120 min	Fertilization ^a
	Oyster, 48 hrs	Percent Normal
	Oyster, 48 hrs	Percent Survival
	Algae, 96 hrs	Percent Inhibition
	Pink Shrimp, 7 days	Percent Survival
	Fish, 7 days	Biomass
	Fish, 7 days	Growth
	Fish, 7 days	Percent Survival
	Fish, 96 hrs	Percent Survival
	Mysid, 7 days	Biomass
	Mysid, 7 days	Fecundity ^a
	Mysid, 7 days	Growth
	Mysid, 7 days	Percent Survival
	Mysid, 96 hrs	Percent Survival
	Mussel, 48 hrs	Percent Normal
	Mussel, 48 hrs	Percent Survival
	Diatom, 96 hrs	Percent Inhibition

^a - These samples did not have any detected concentrations of PAHs or benchmark parameters.

The TPAH concentrations were calculated as the sum of detected concentrations reported for any of the standard 41 analytes reported for EPA Method 8270C. TPAH concentrations reported directly by the analytical laboratory were not used. EPA chronic aquatic life ratios for PAHs developed for the OSAT report (UAC 2010) were used in this evaluation.

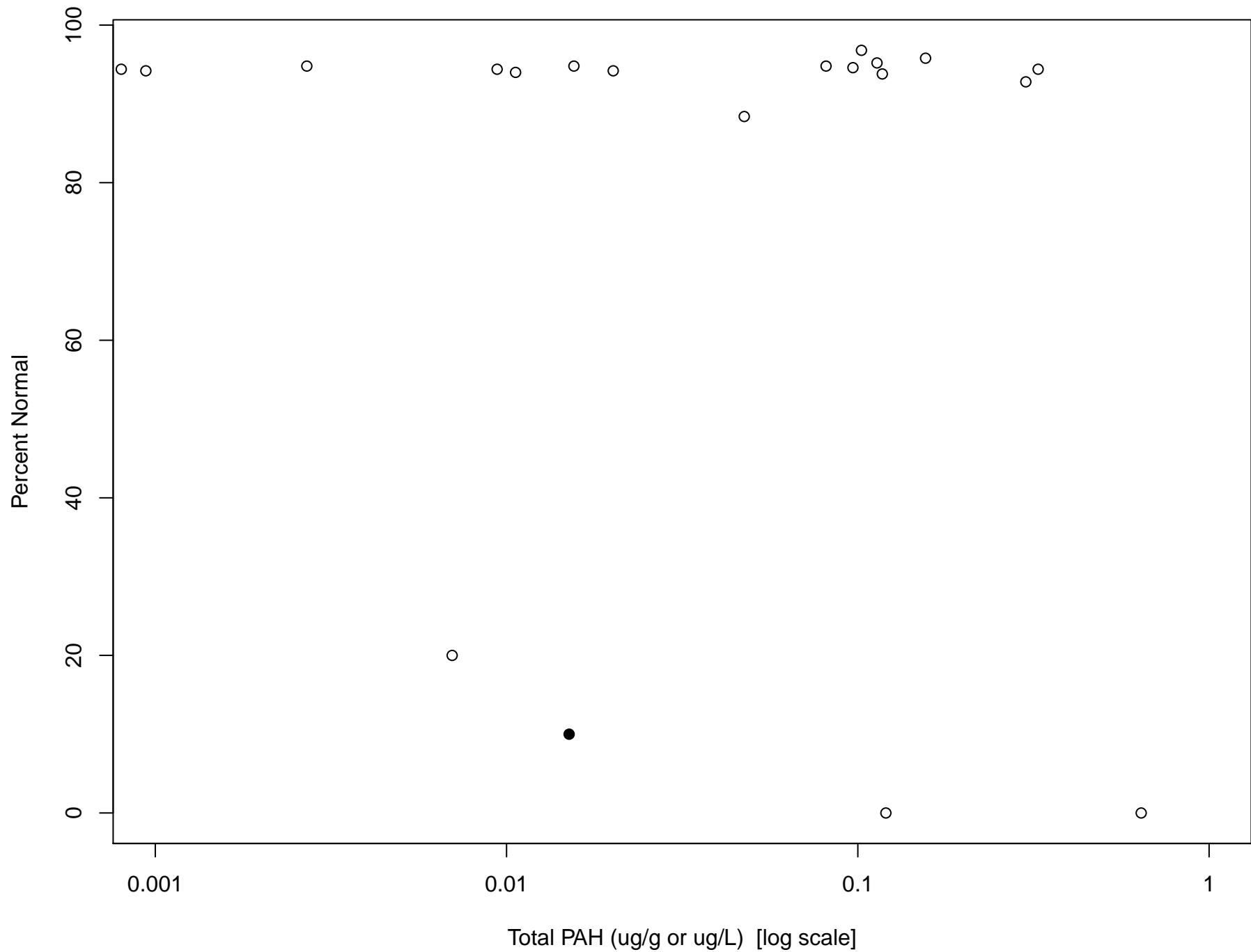
For purposes of clarity, non-detected values are not shown on the plots. No plots are included when all samples measured for a specific endpoint and test had no detected PAHs and no detected parameters included in the EPA benchmark calculation. This occurred for the two samples evaluated for fertilization in the sea urchin 120 minute surface water test and 10 samples evaluated for fecundity in the mysid 7-day surface water test.

Sea Urchin 48-hour sediment test



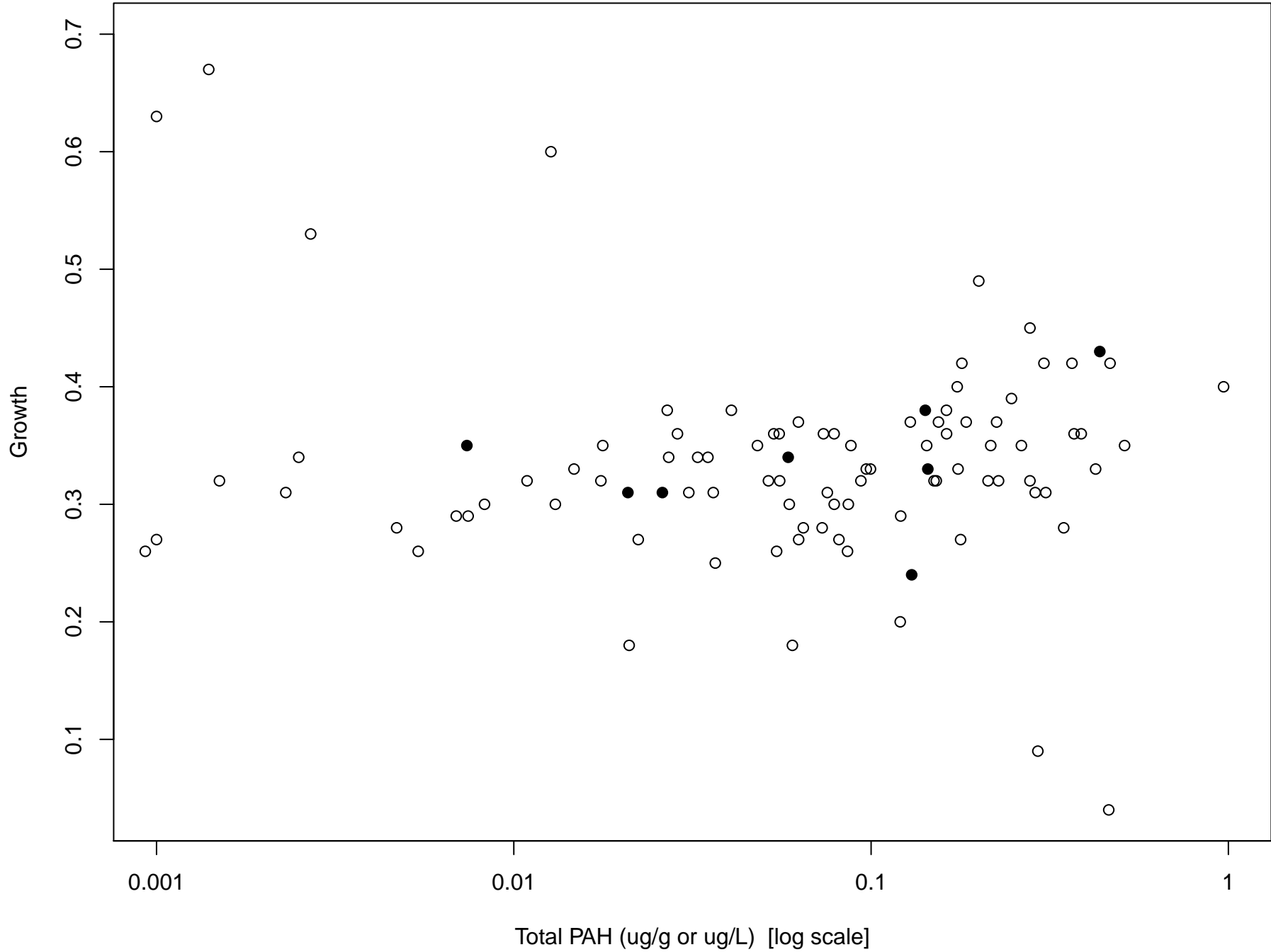
Note: Filled symbols indicate significantly different from the control

Sea Urchin 48-hour sediment test



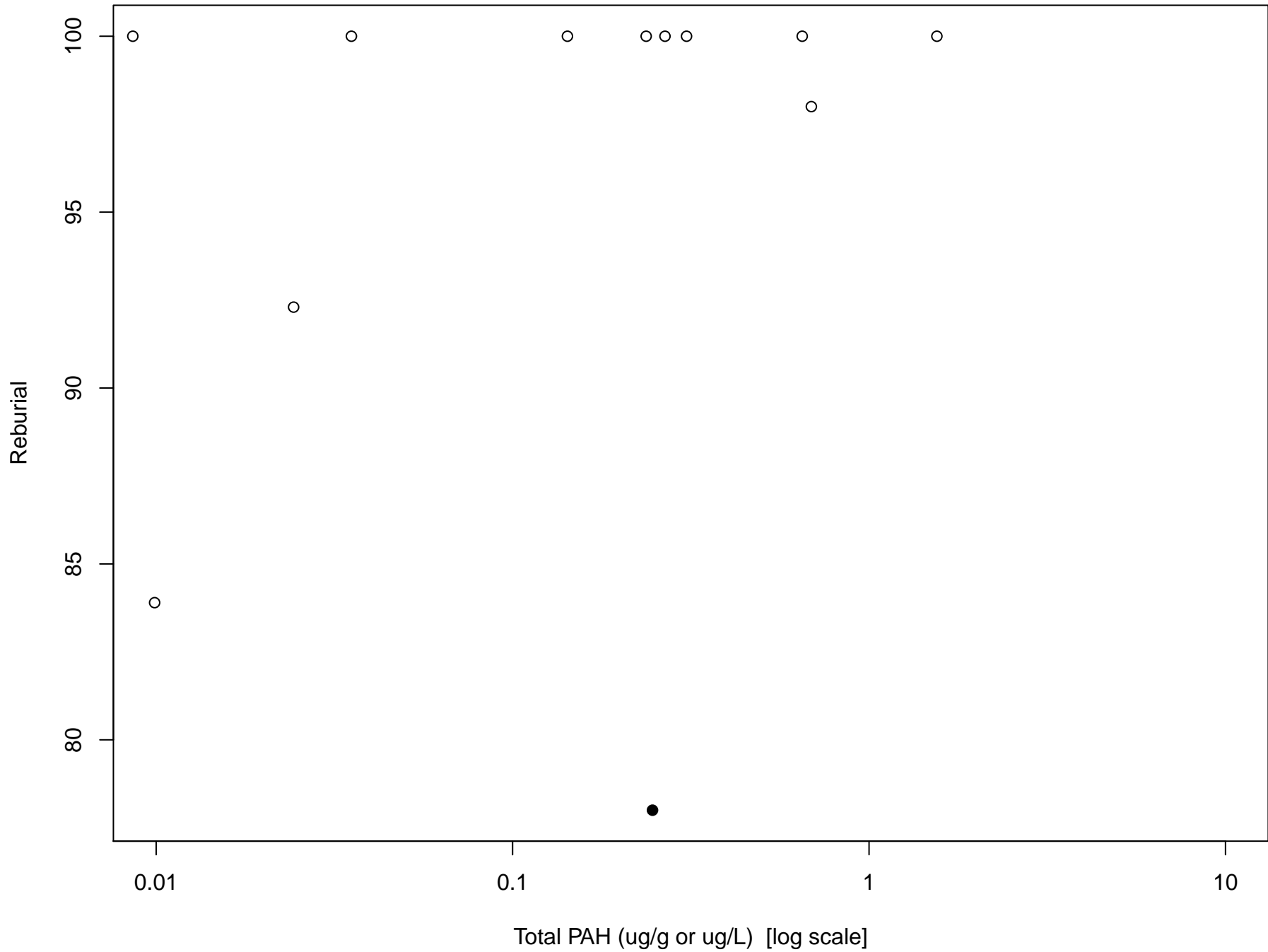
Note: Filled symbols indicate significantly different from the control

Amphipod 10-day sediment test



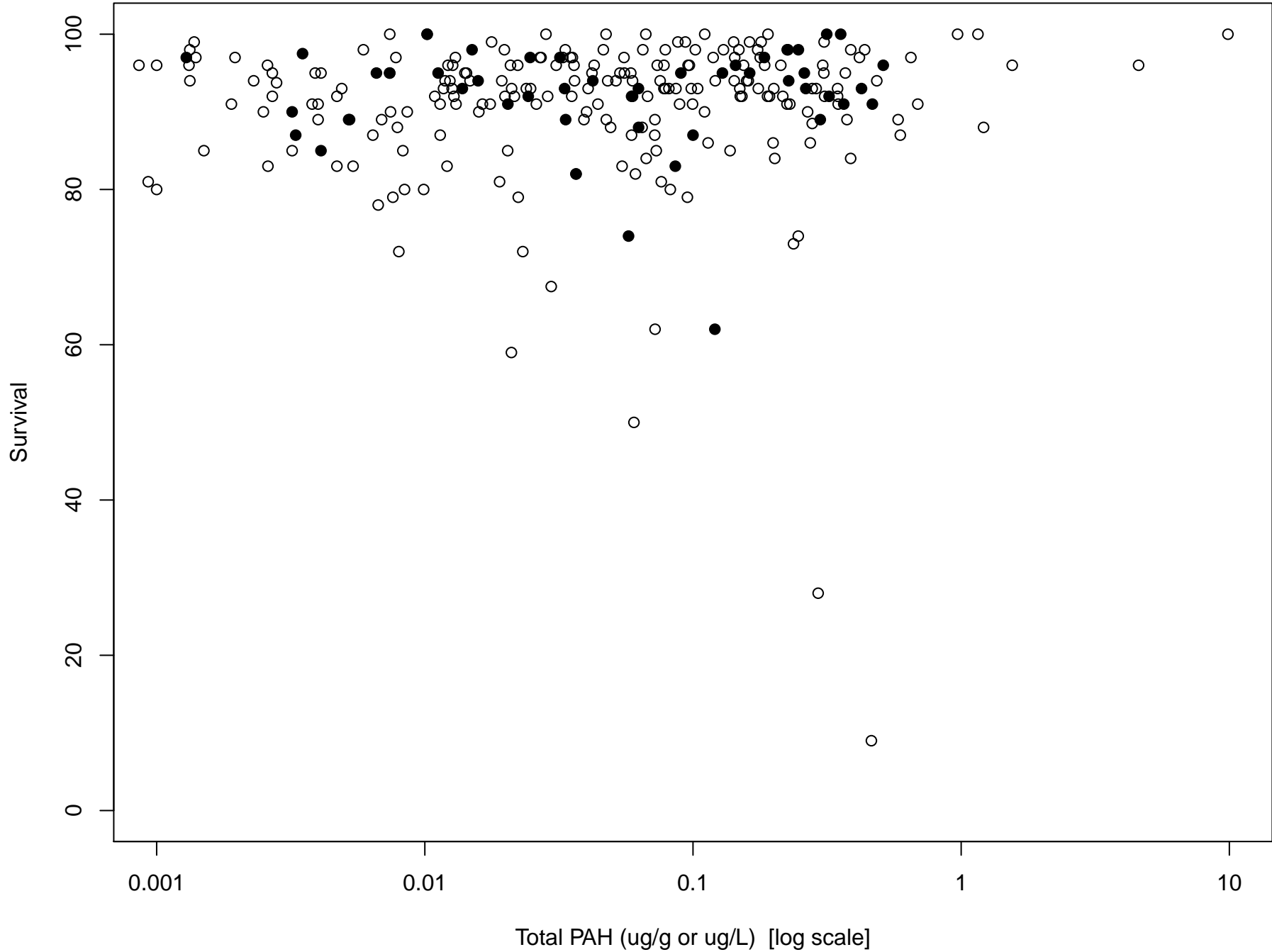
Note: Filled symbols indicate significantly different from the control

Amphipod 10-day sediment test



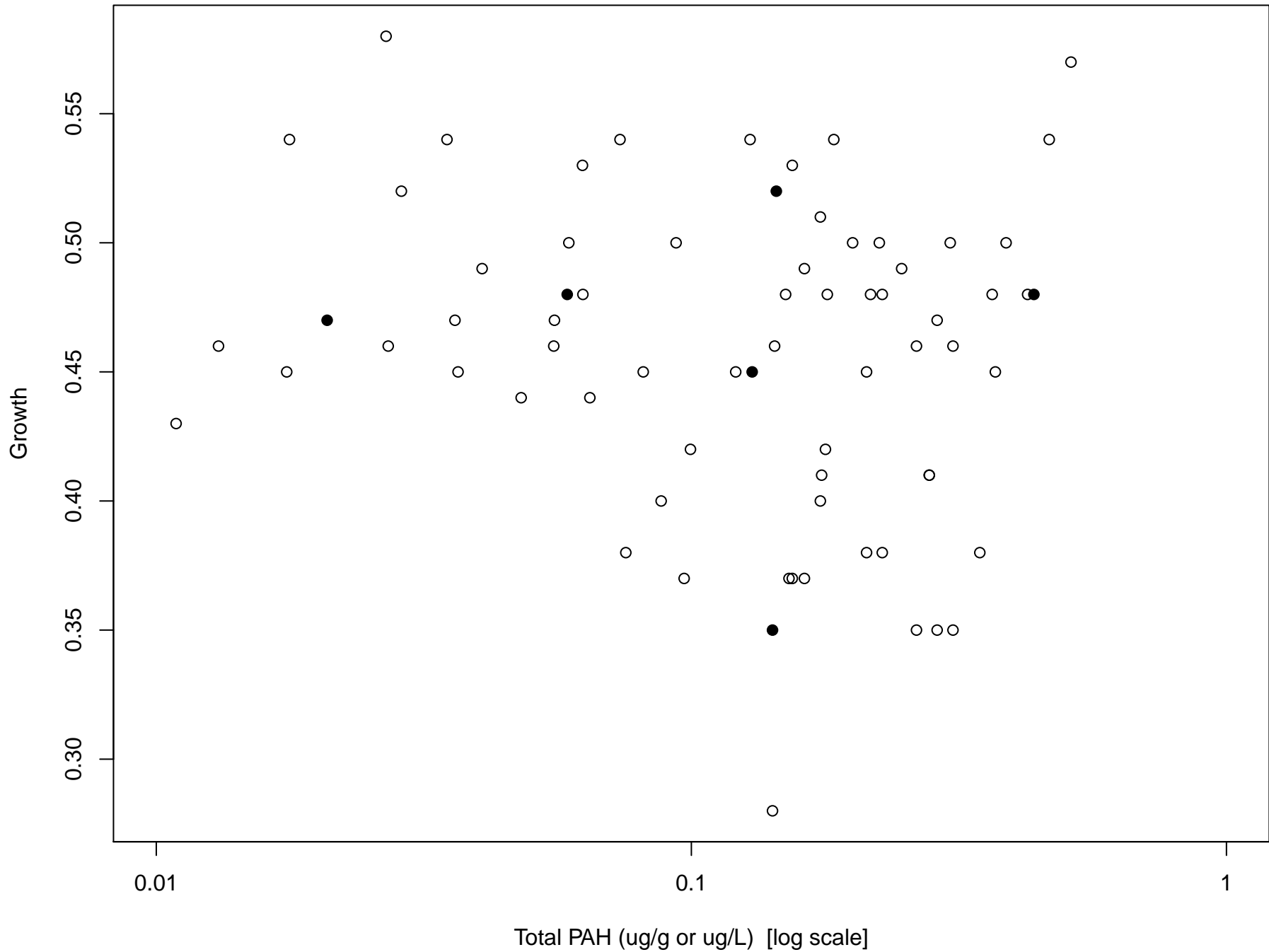
Note: Filled symbols indicate significantly different from the control

Amphipod 10-day sediment test



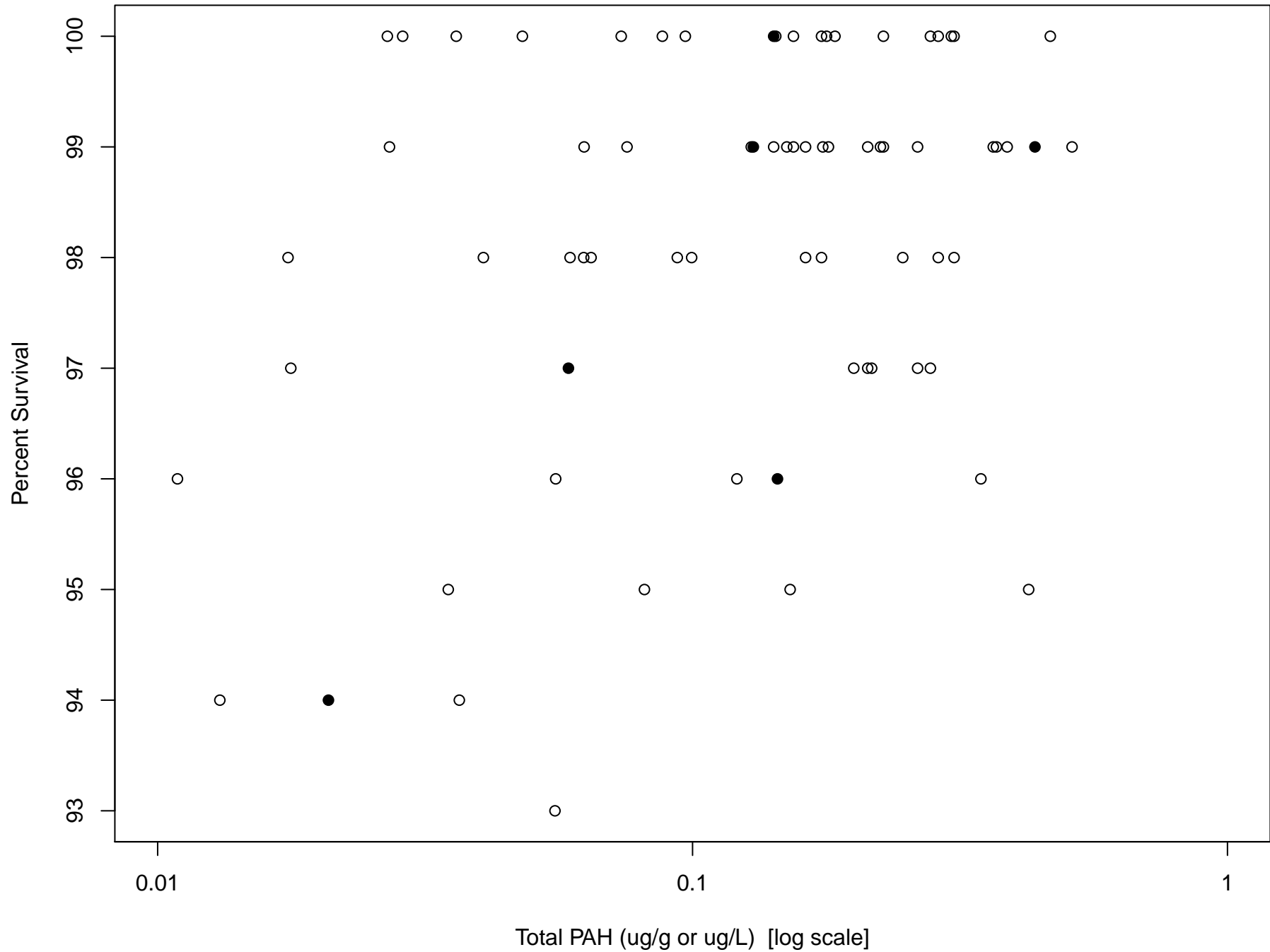
Note: Filled symbols indicate significantly different from the control

Amphipod 96-hour sediment test



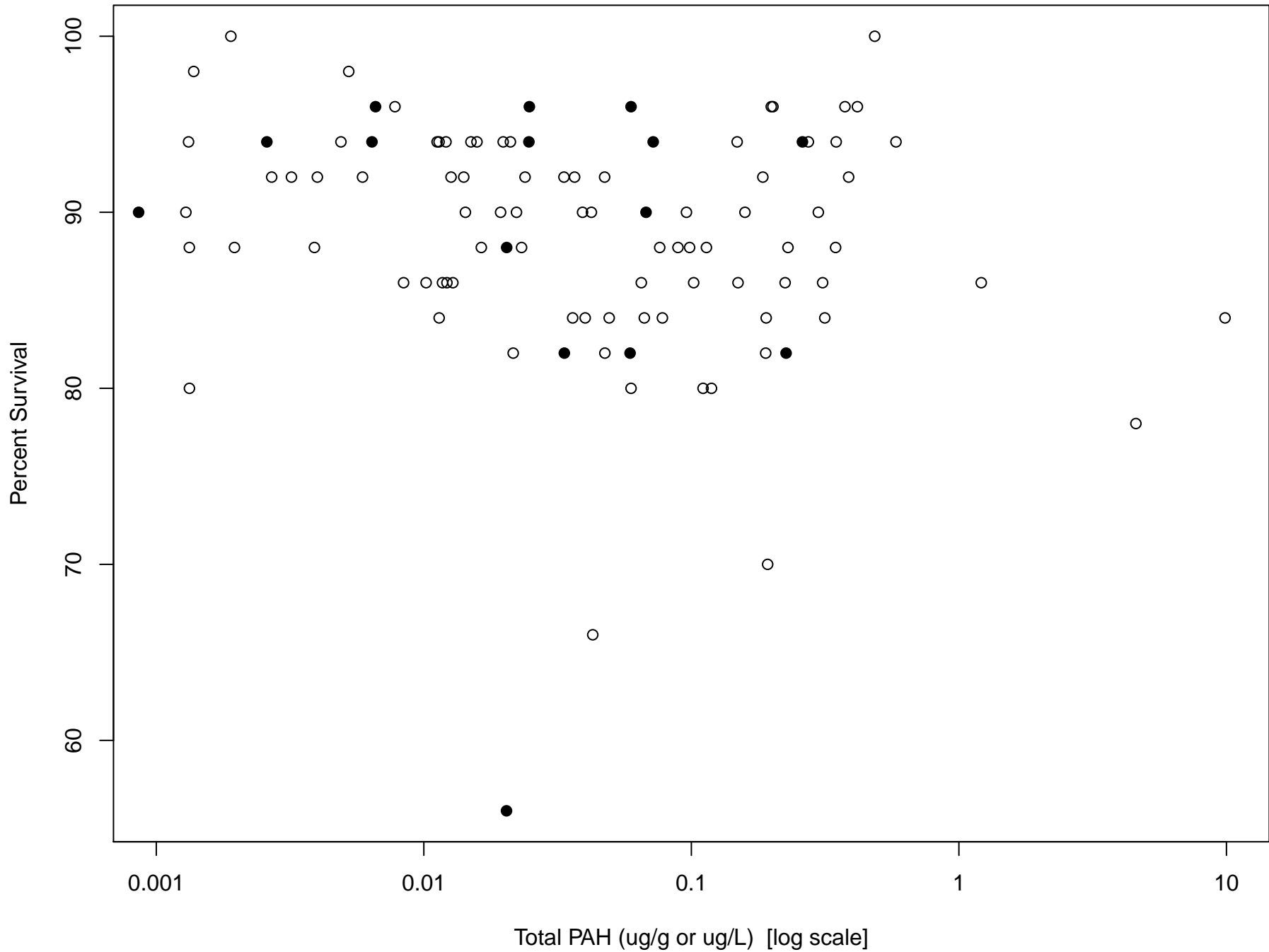
Note: Filled symbols indicate significantly different from the control

Amphipod 96-hour sediment test



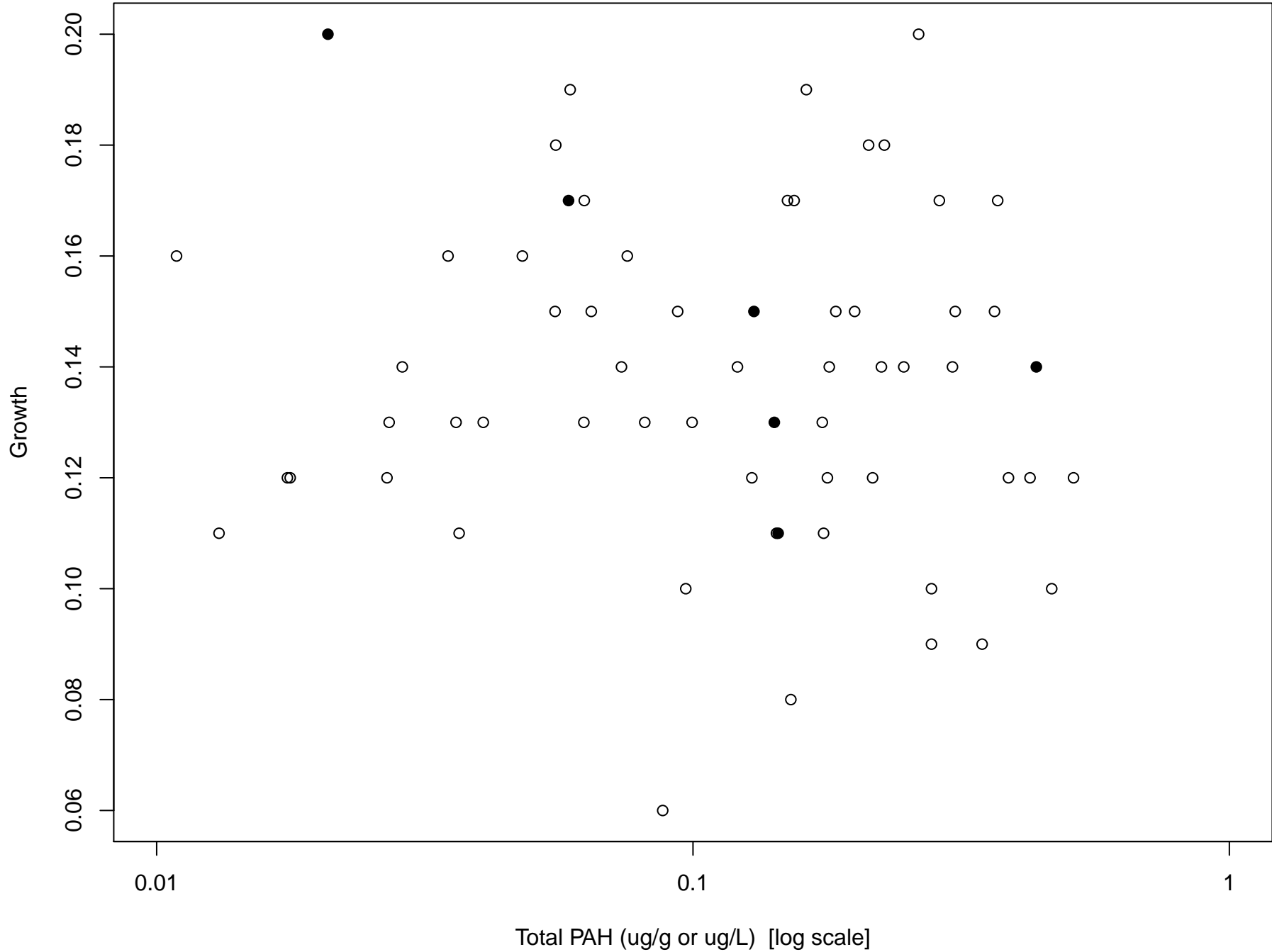
Note: Filled symbols indicate significantly different from the control

Mysid 48-hour sediment test



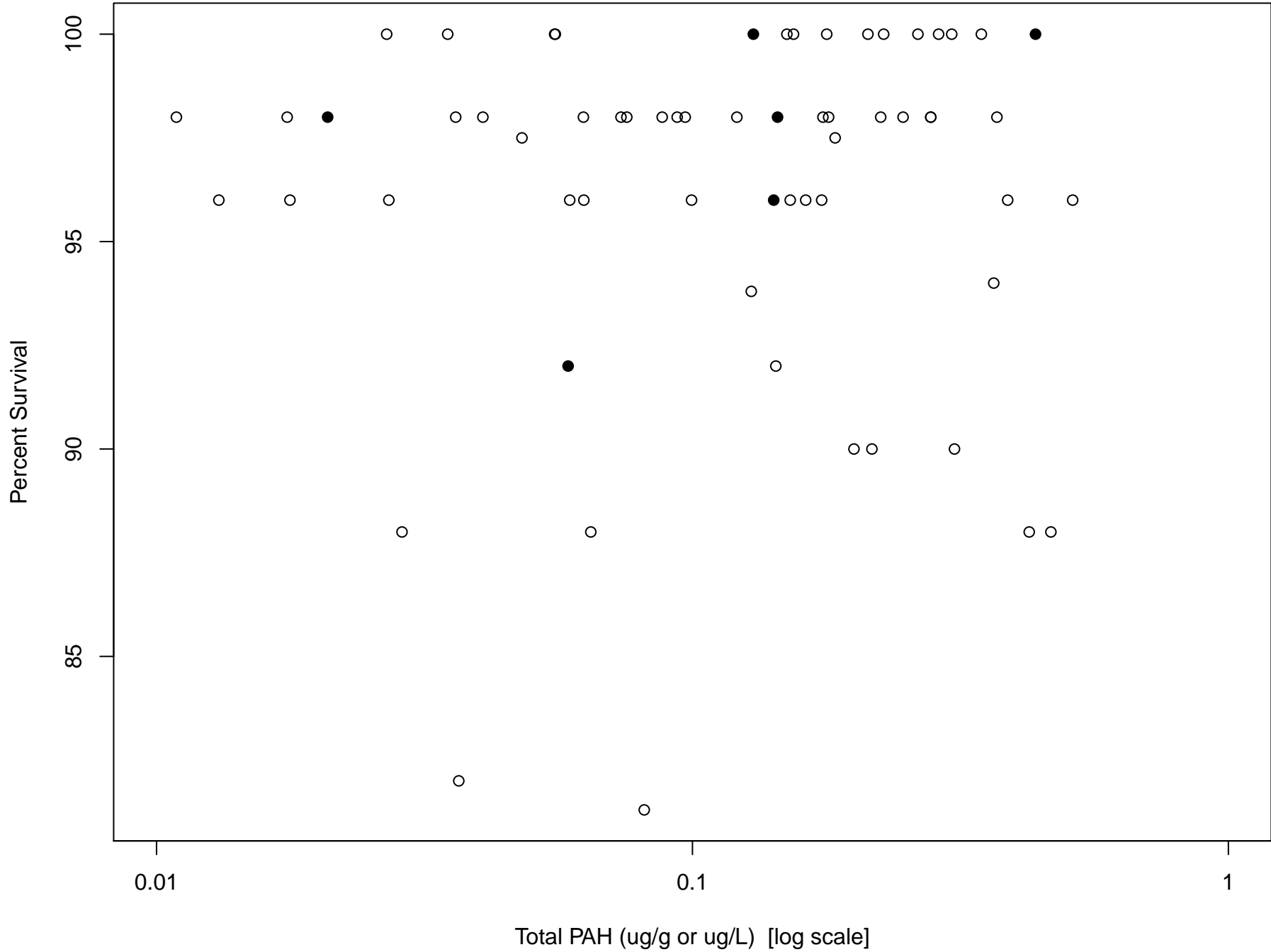
Note: Filled symbols indicate significantly different from the control

Mysid 96-hour sediment test



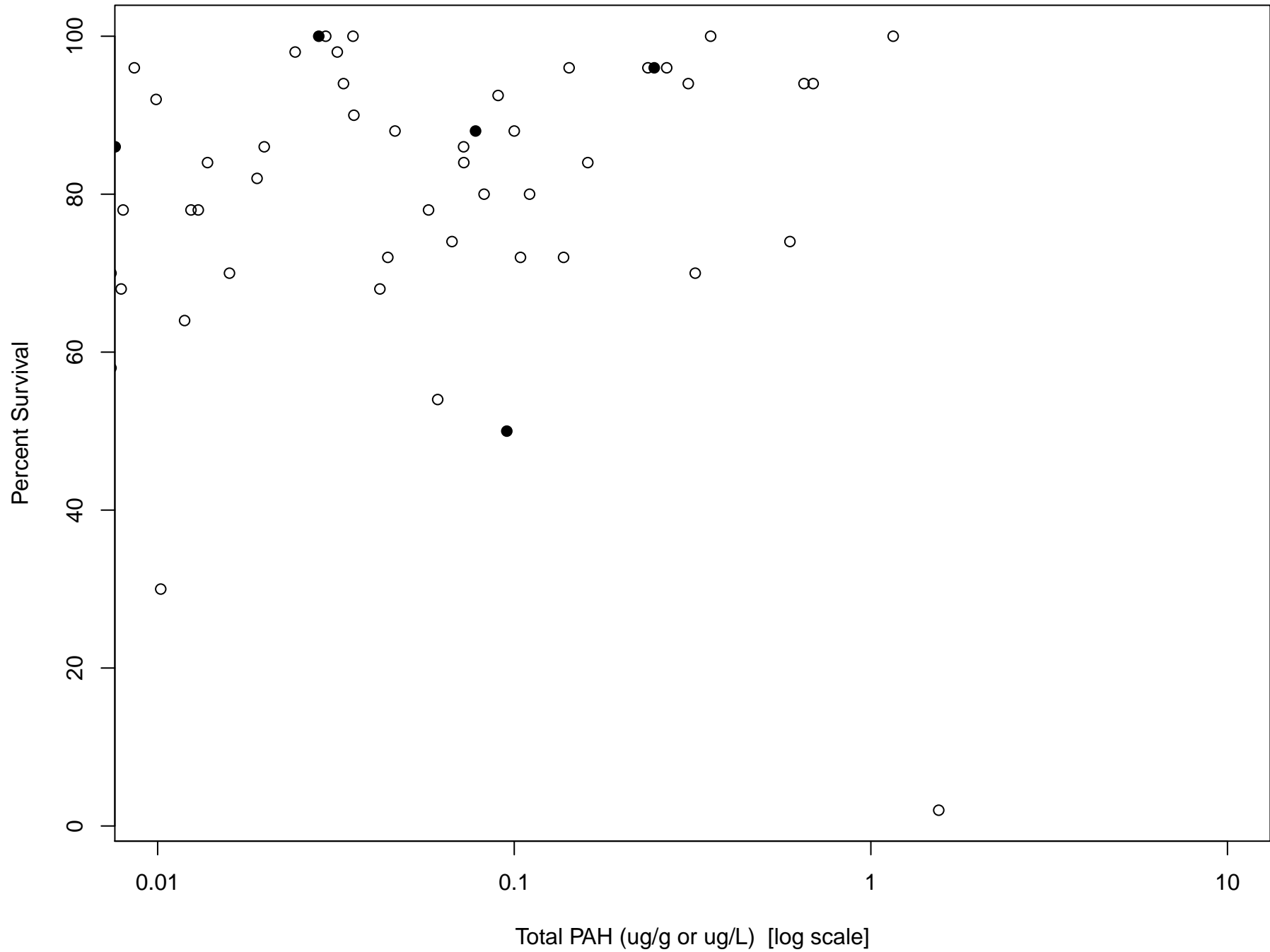
Note: Filled symbols indicate significantly different from the control

Mysid 96-hour sediment test



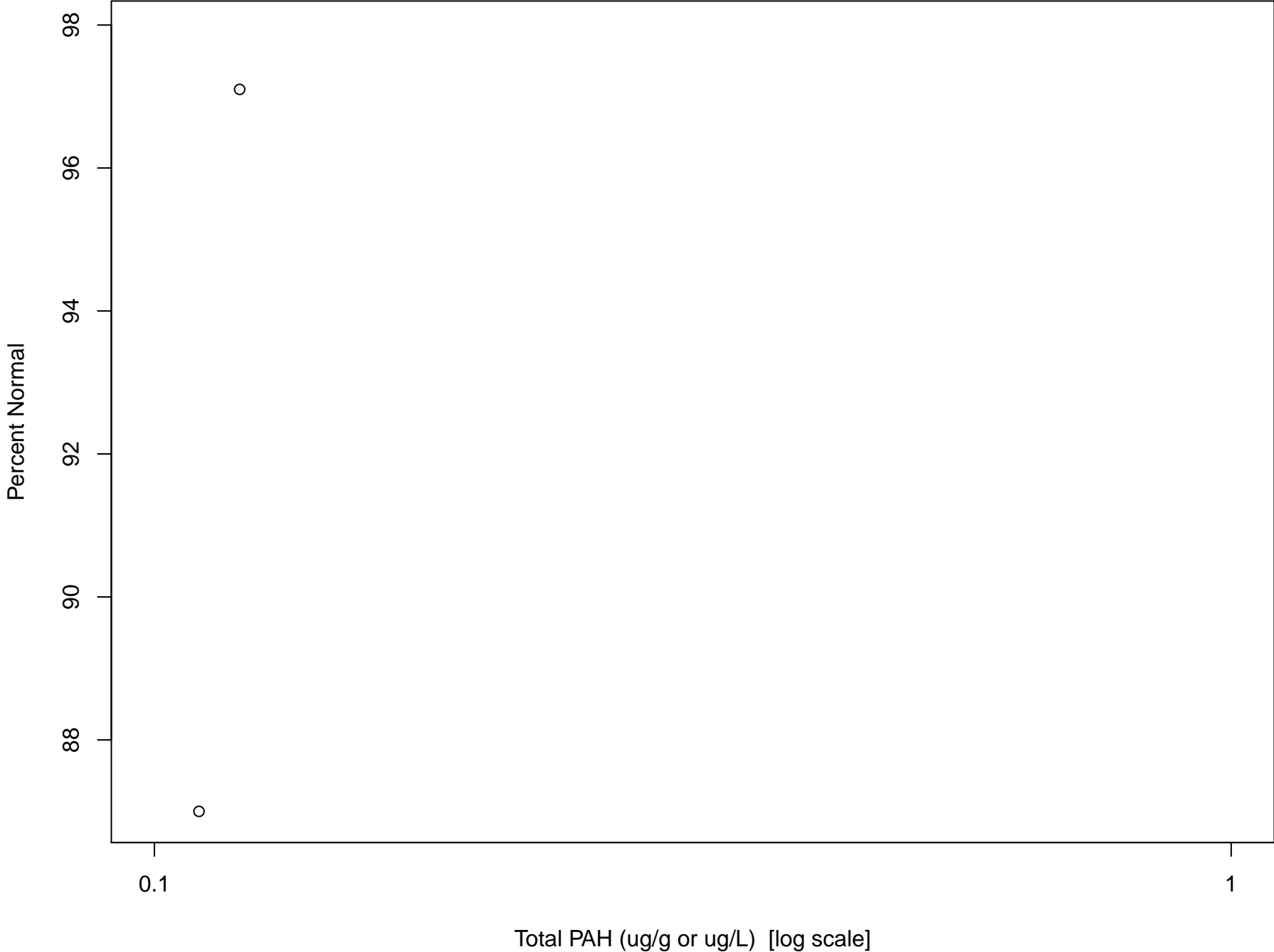
Note: Filled symbols indicate significantly different from the control

Worm 10-day sediment test



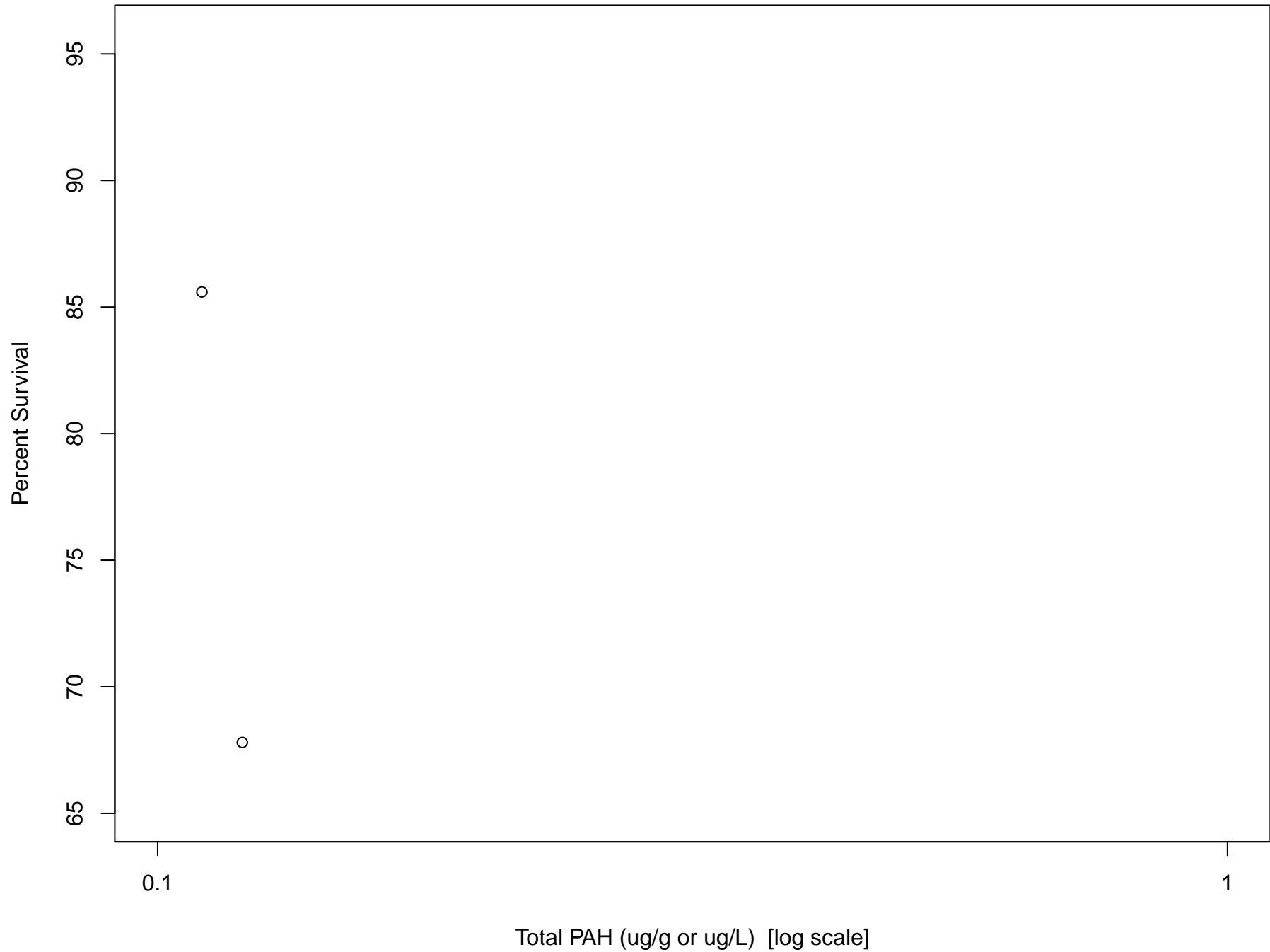
Note: Filled symbols indicate significantly different from the control

Oyster 48-hour surface water test



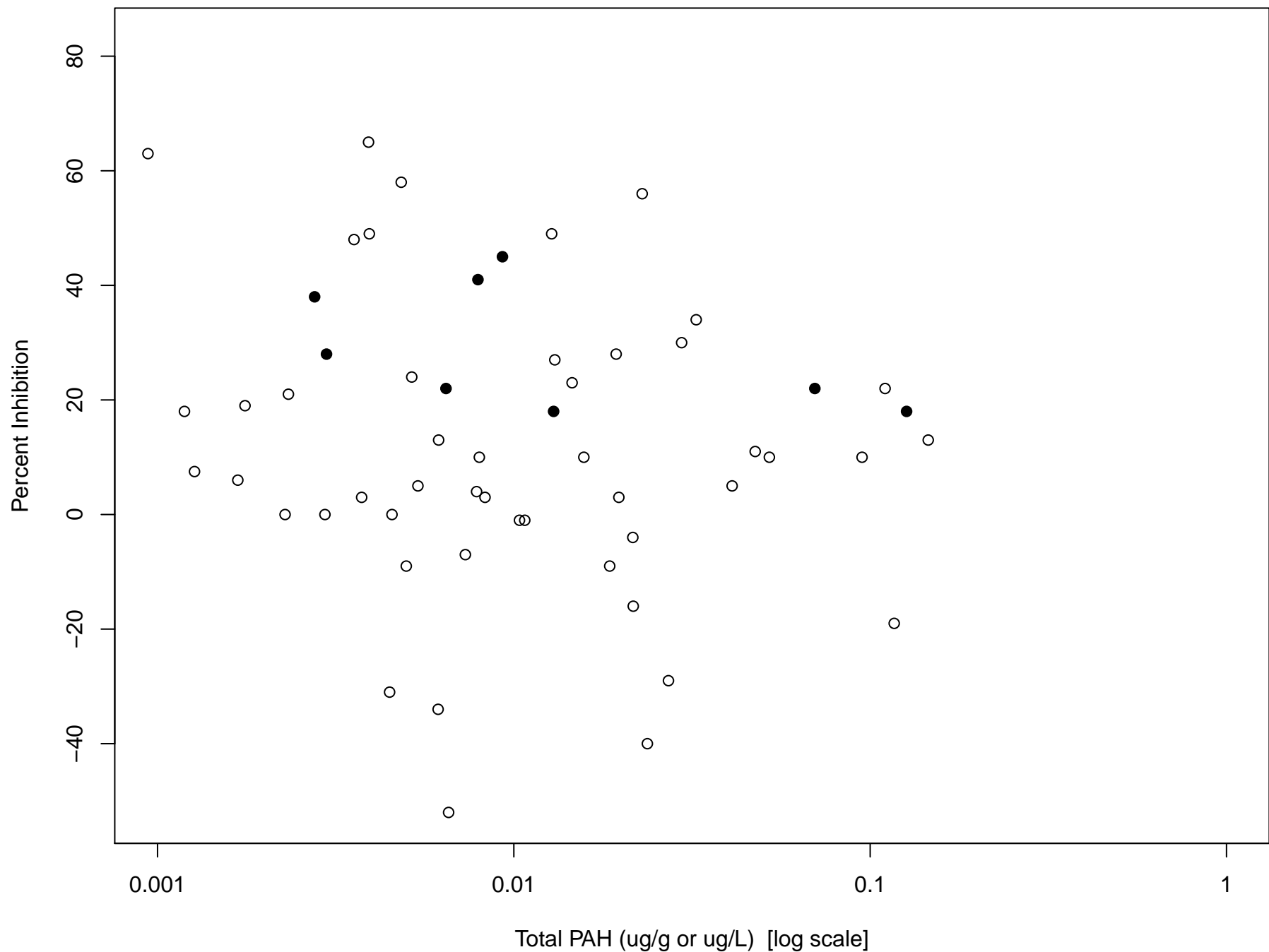
Note: Filled symbols indicate significantly different from the control

Oyster 48-hour surface water test



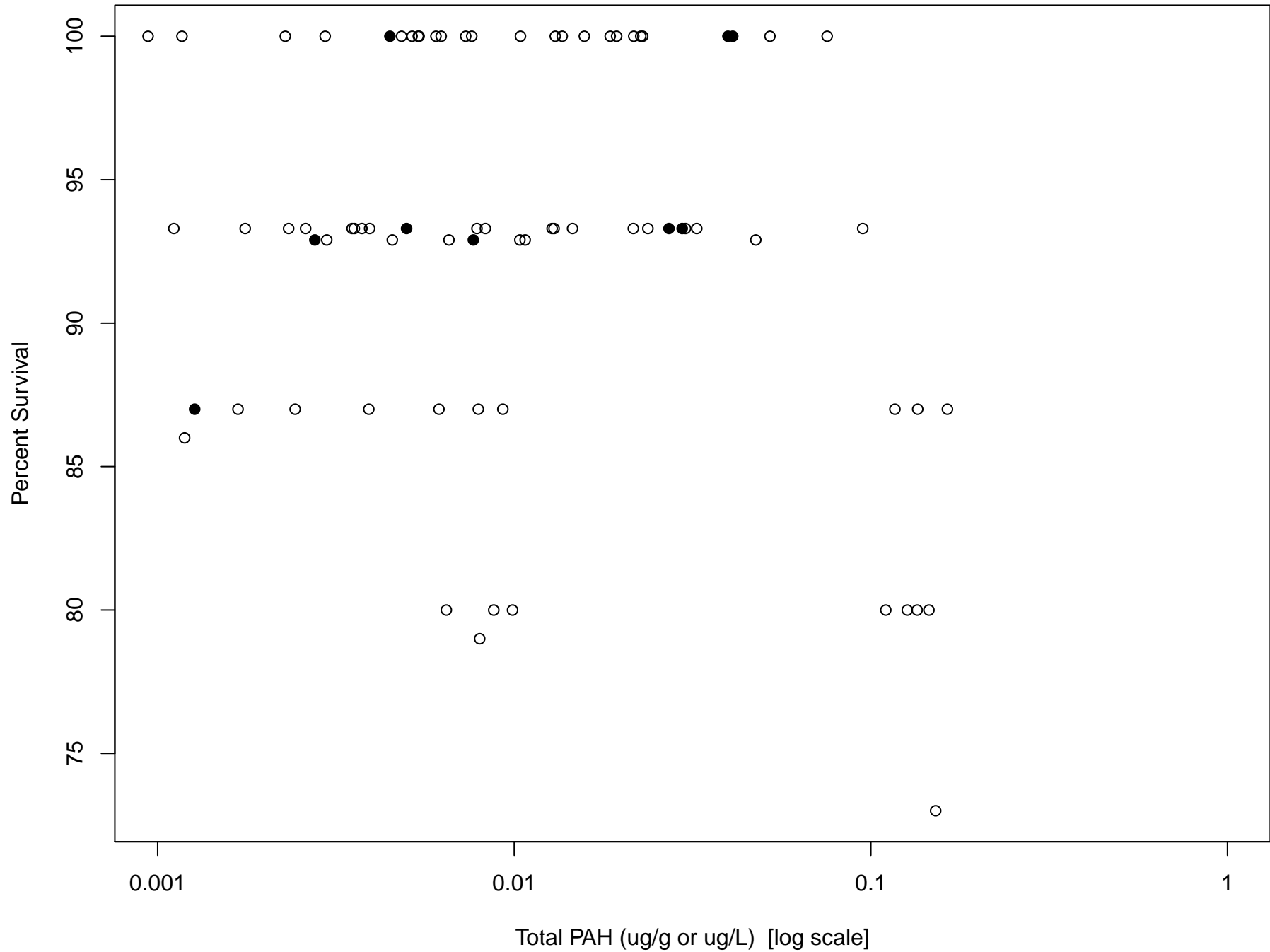
Note: Filled symbols indicate significantly different from the control

Algae 96-hour surface water test



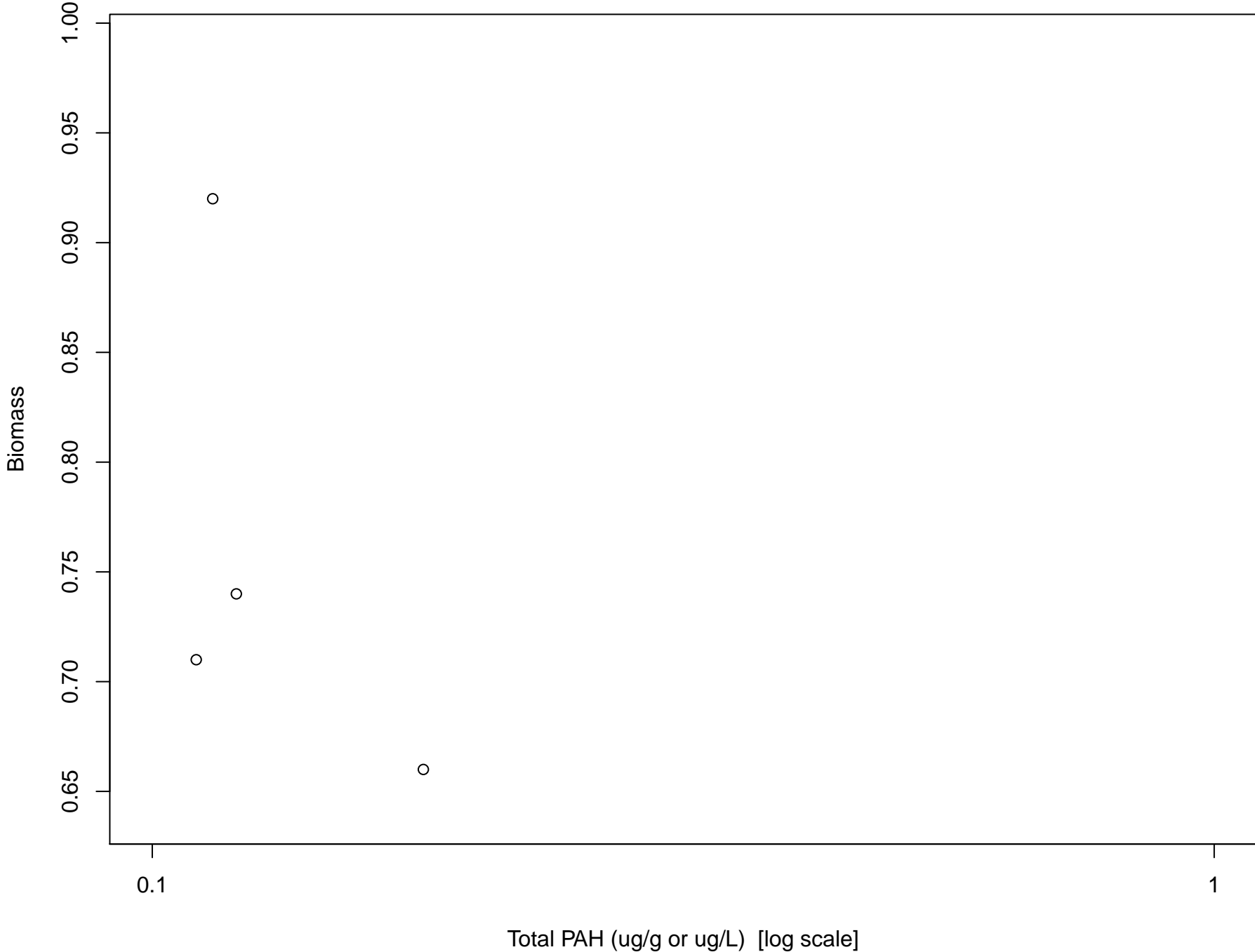
Note: Filled symbols indicate significantly different from the control

Pink shrimp 7-day surface water test



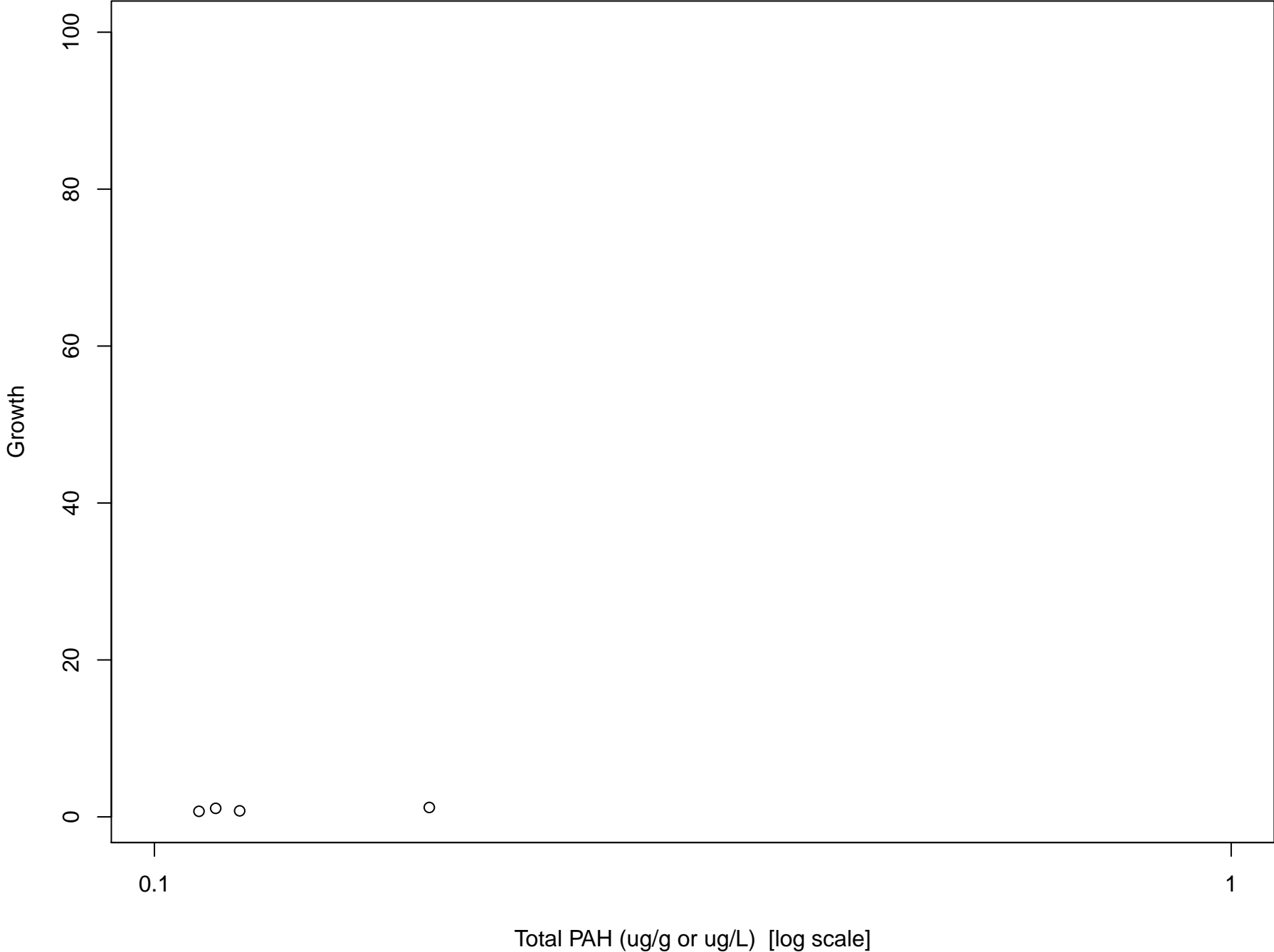
Note: Filled symbols indicate significantly different from the control

Fish 7-day surface water test



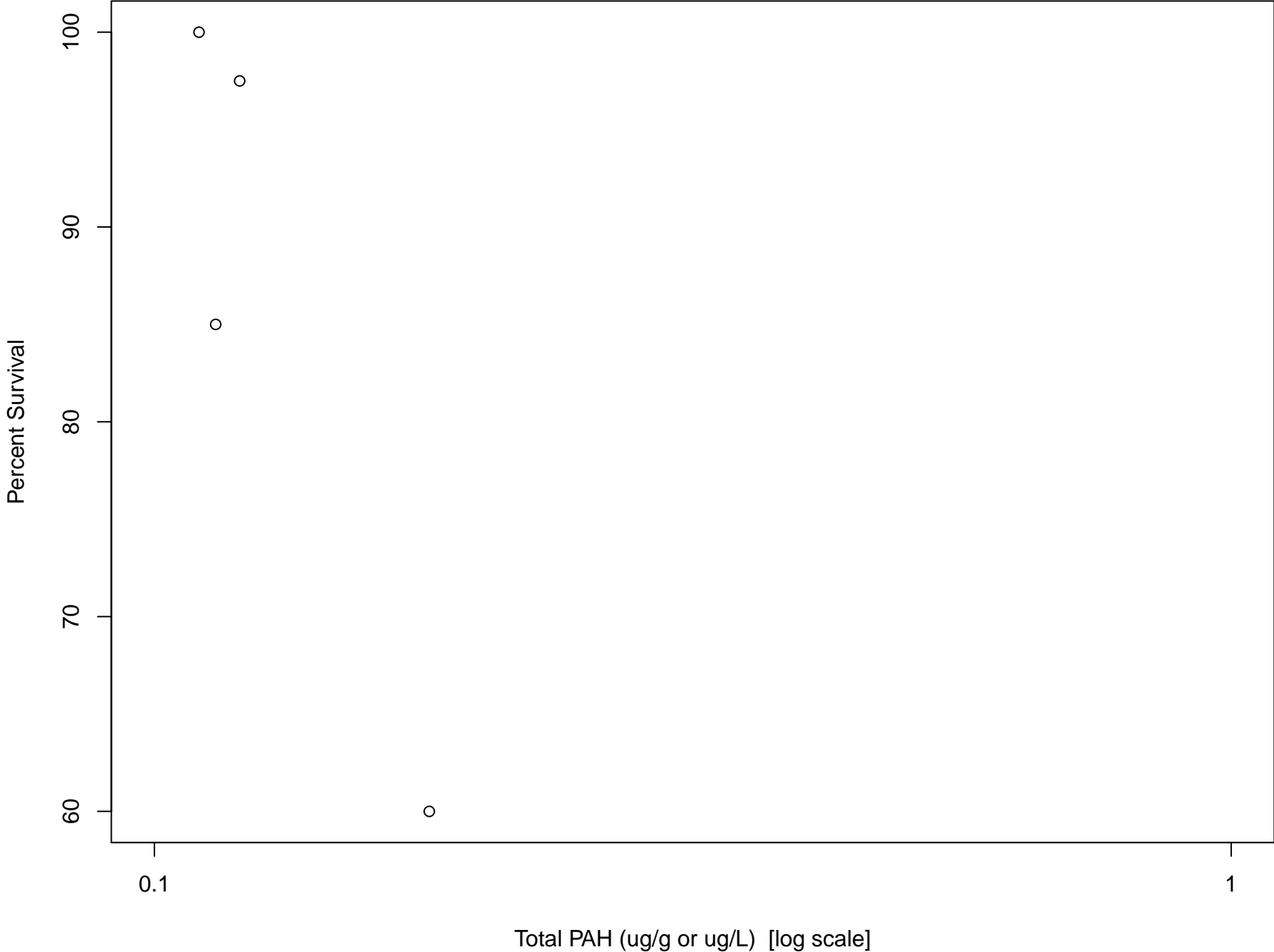
Note: Filled symbols indicate significantly different from the control

Fish 7-day surface water test



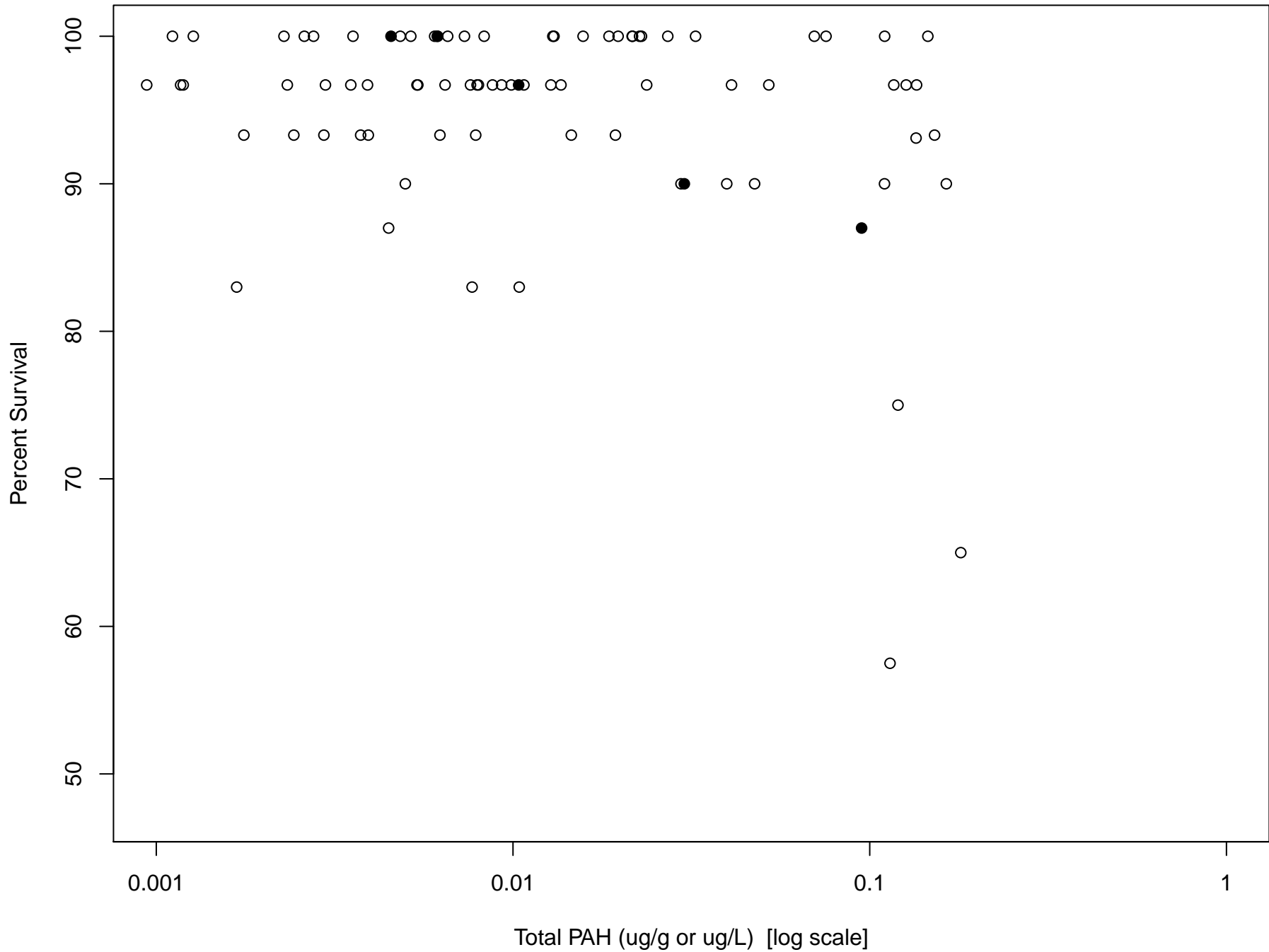
Note: Filled symbols indicate significantly different from the control

Fish 7-day surface water test



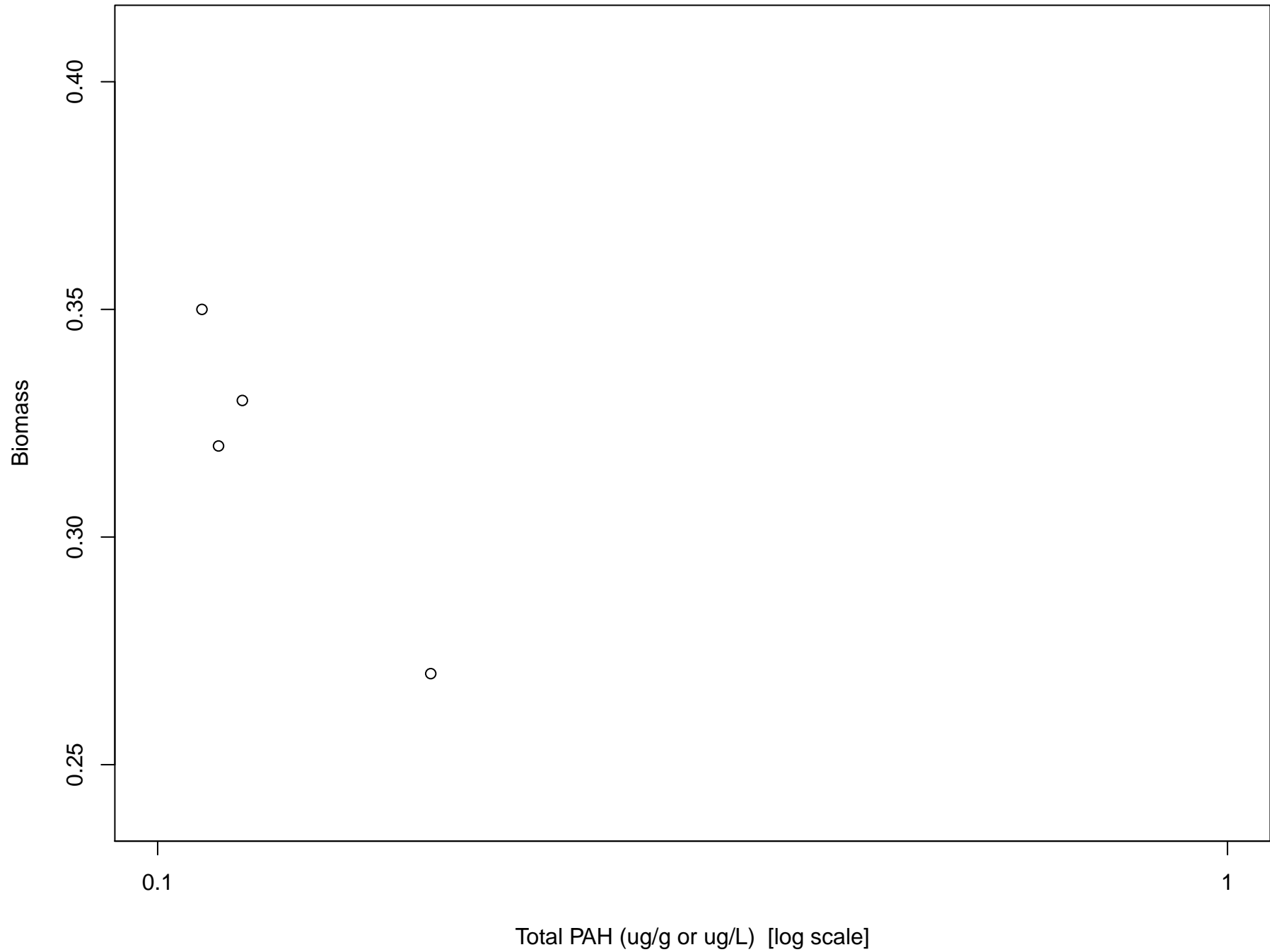
Note: Filled symbols indicate significantly different from the control

Fish 96-hour surface water test



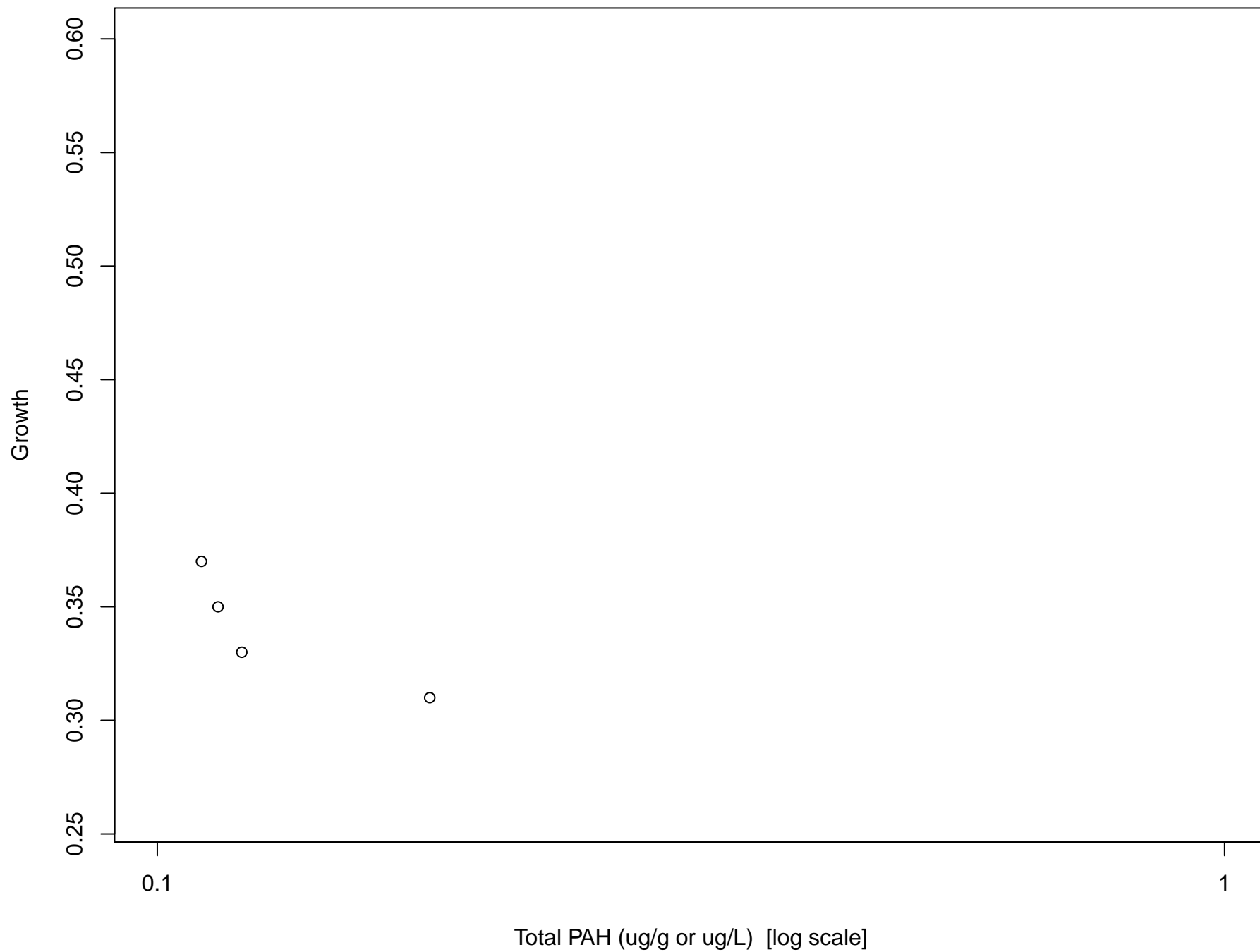
Note: Filled symbols indicate significantly different from the control

Mysid 7-day surface water test



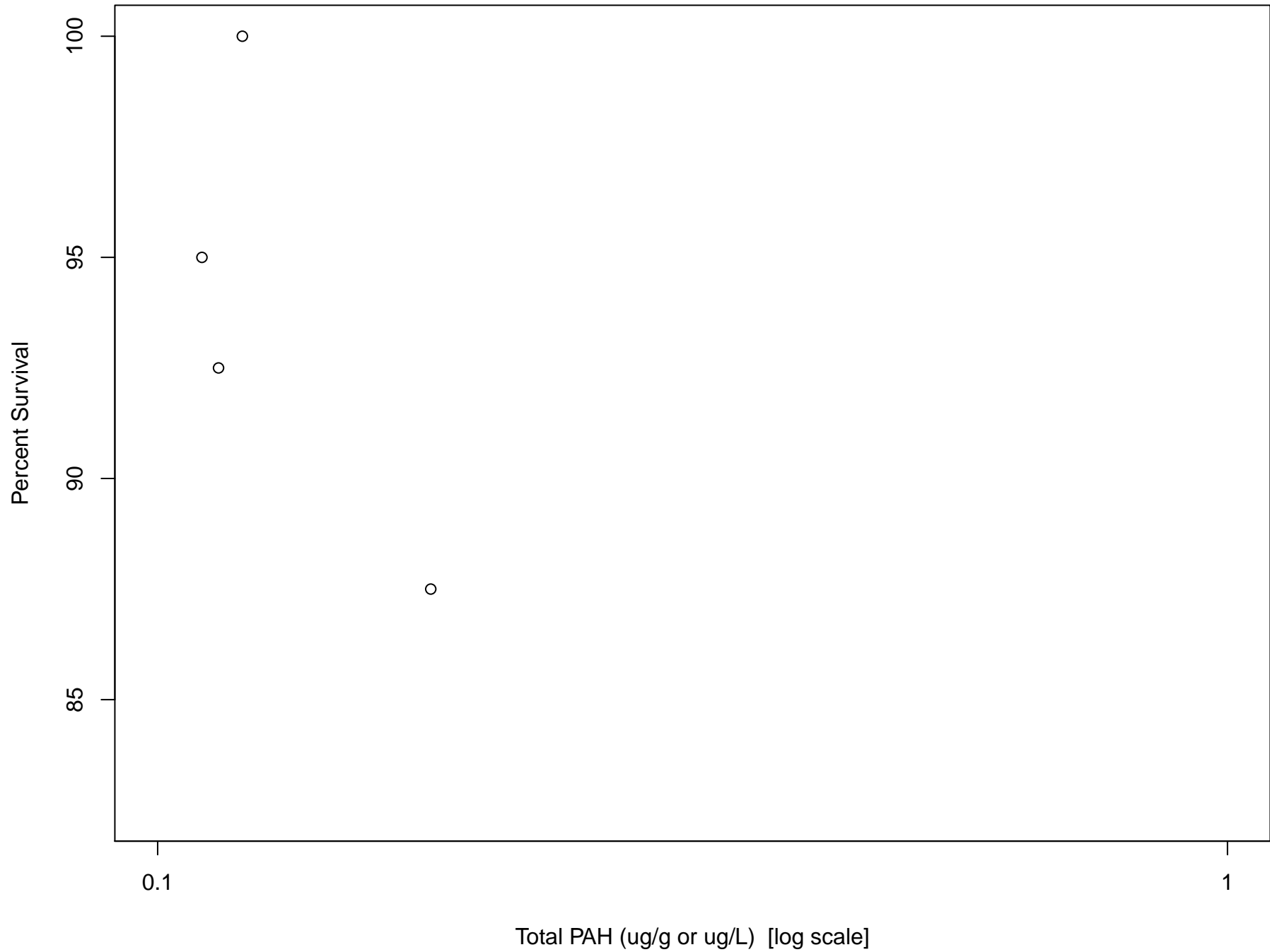
Note: Filled symbols indicate significantly different from the control

Mysid 7-day surface water test



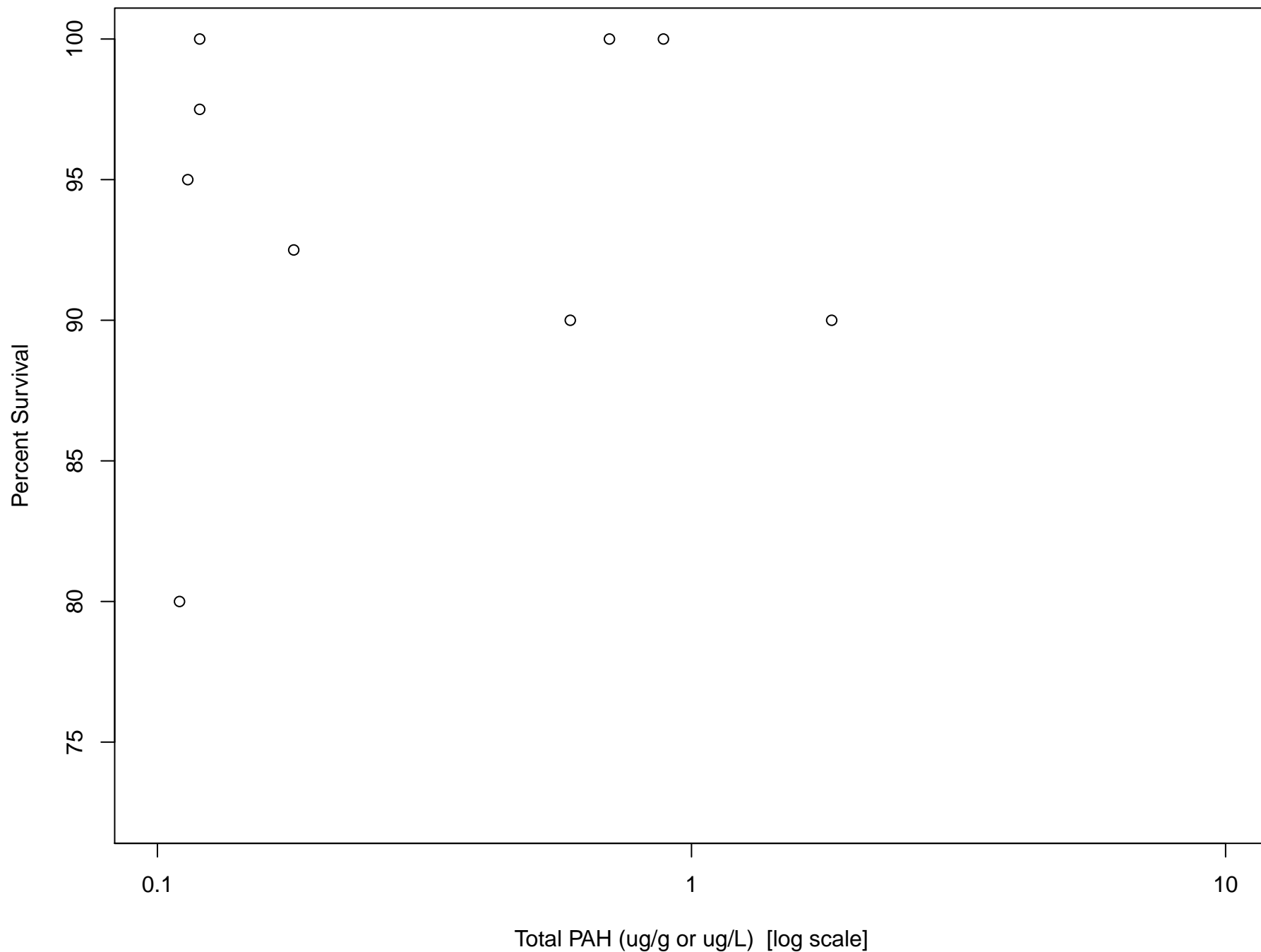
Note: Filled symbols indicate significantly different from the control

Mysid 7-day surface water test



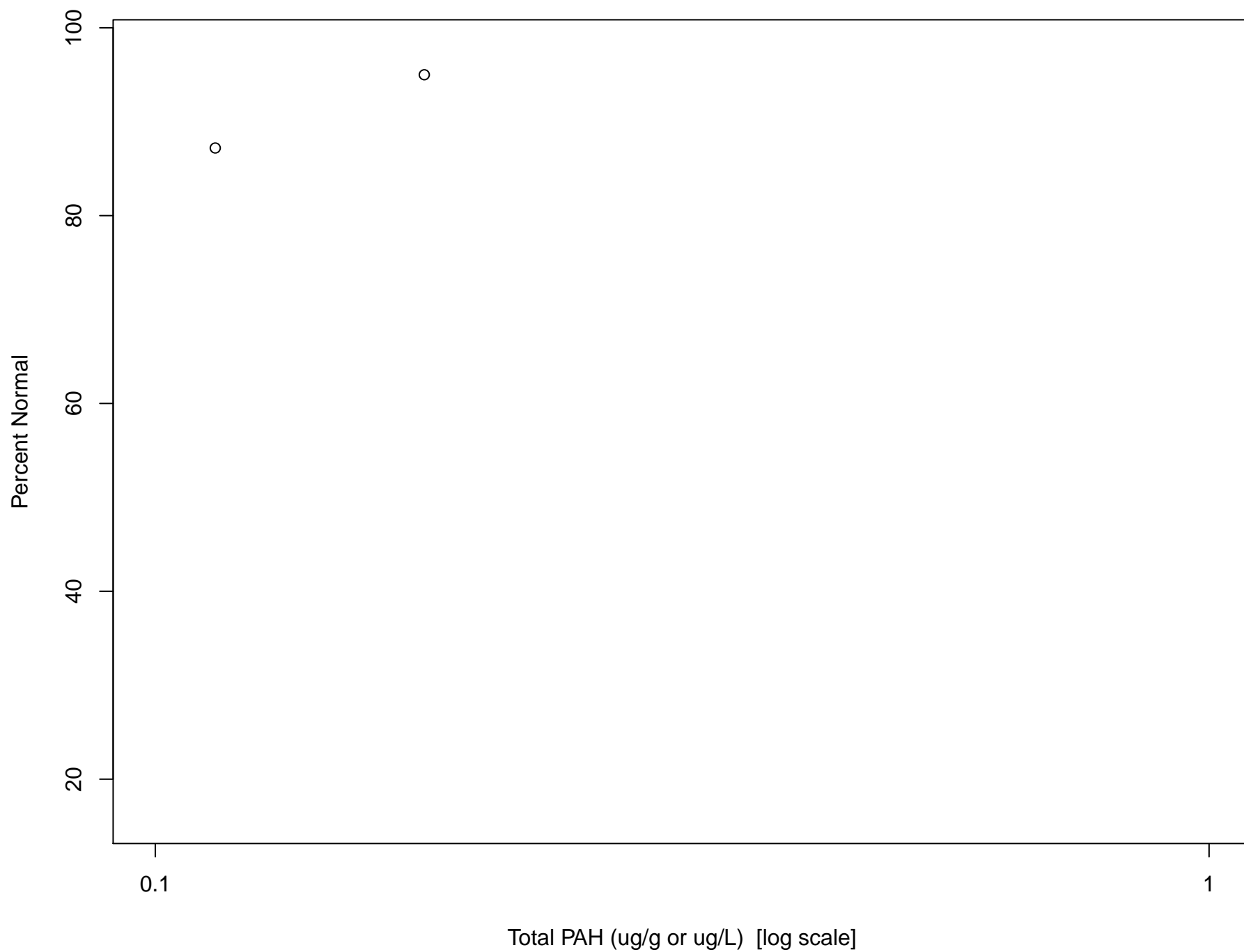
Note: Filled symbols indicate significantly different from the control

Mysid 96-hour surface water test



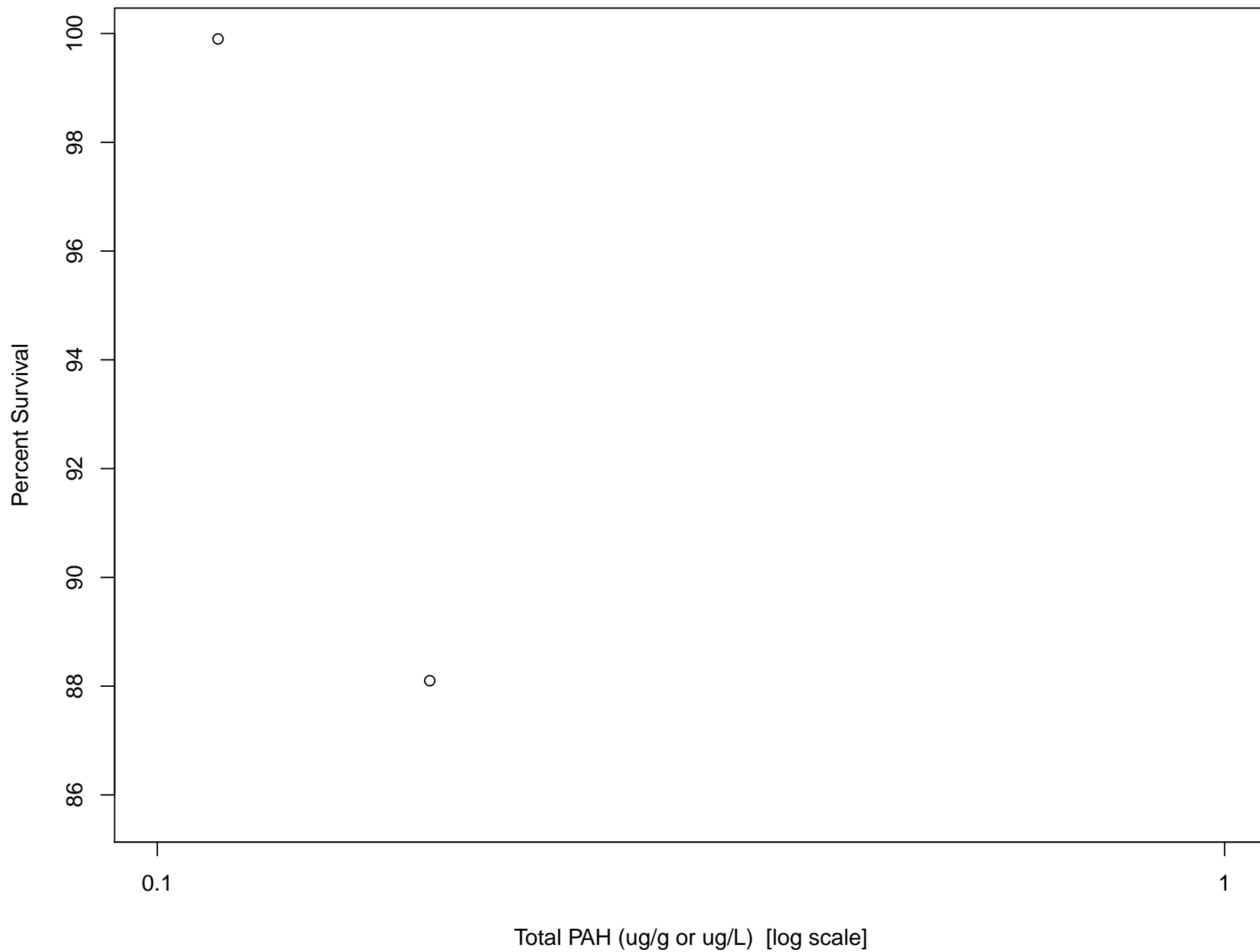
Note: Filled symbols indicate significantly different from the control

Mussel 48-hour surface water test



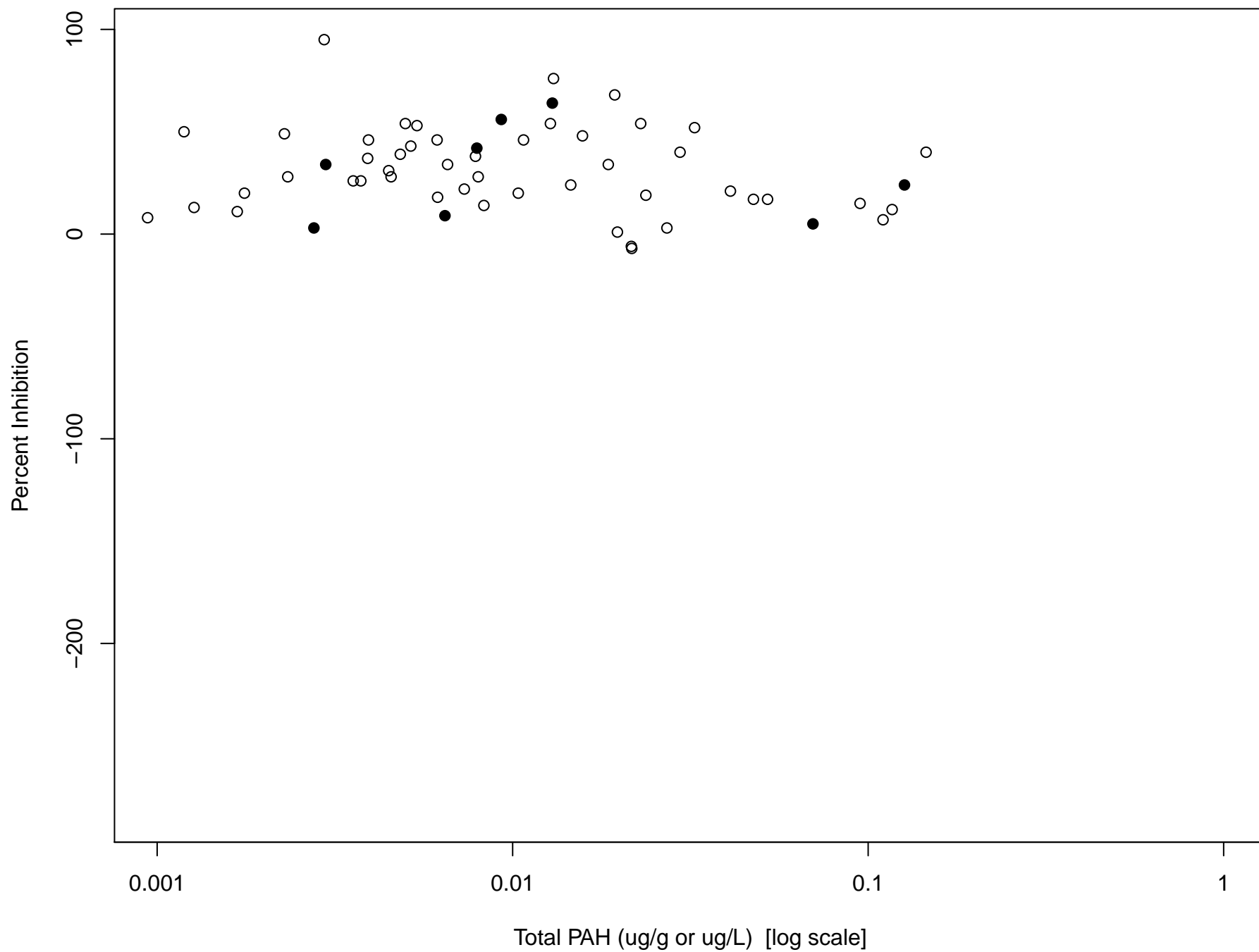
Note: Filled symbols indicate significantly different from the control

Mussel 48-hour surface water test



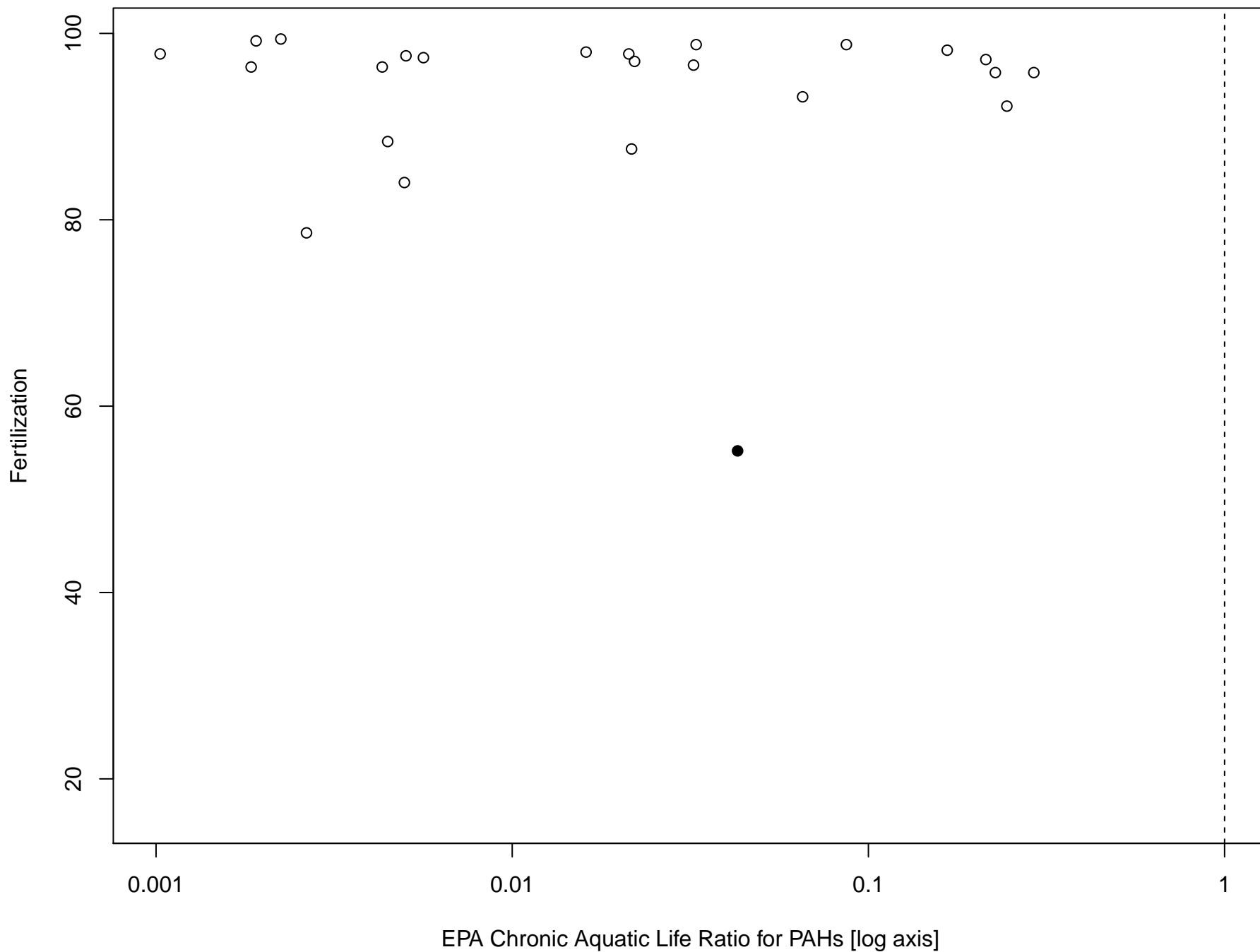
Note: Filled symbols indicate significantly different from the control

Diatom 96-hour surface water test



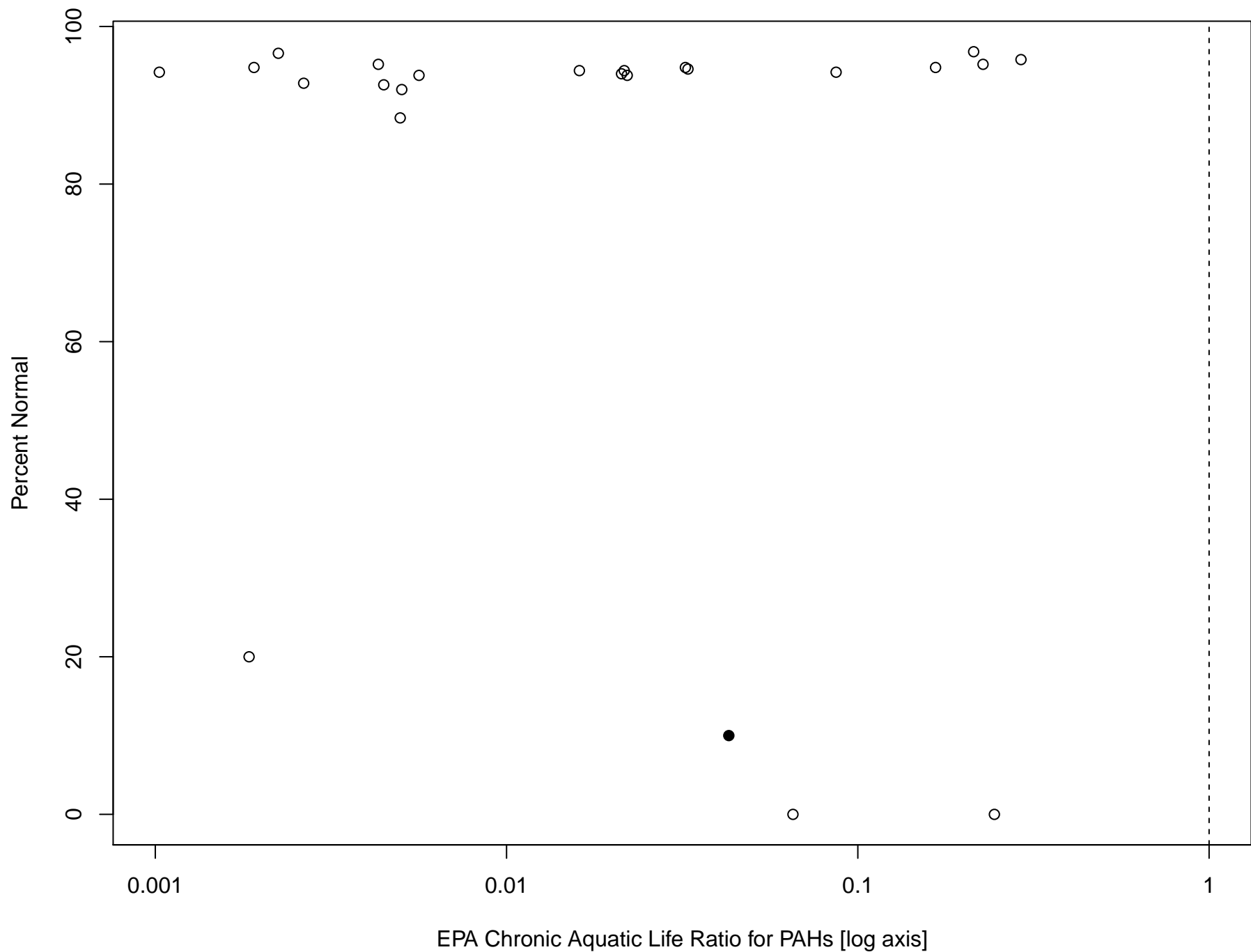
Note: Filled symbols indicate significantly different from the control

Sea Urchin 48-hour sediment test



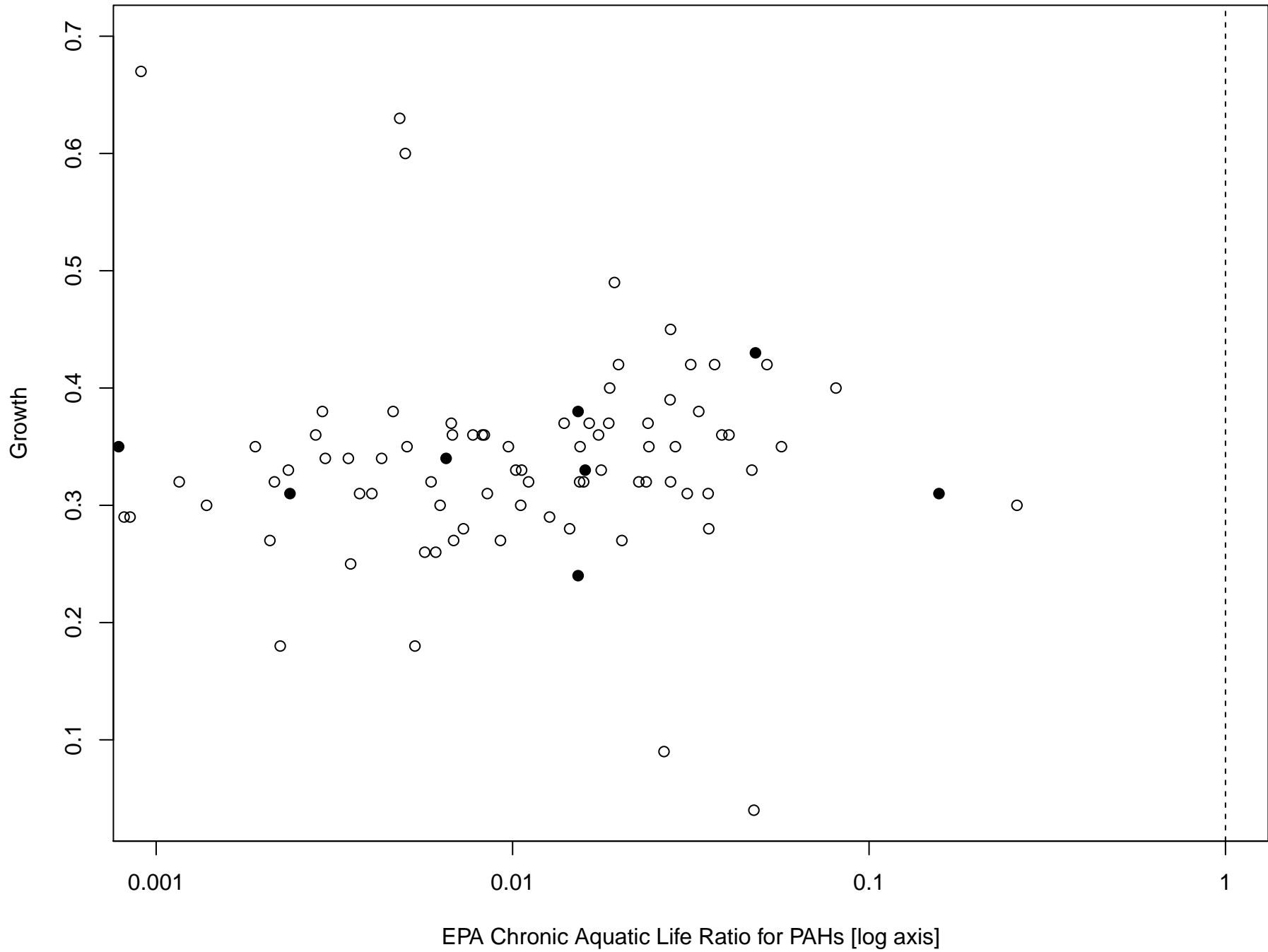
Note: Filled symbols indicate significantly different from the control

Sea Urchin 48-hour sediment test



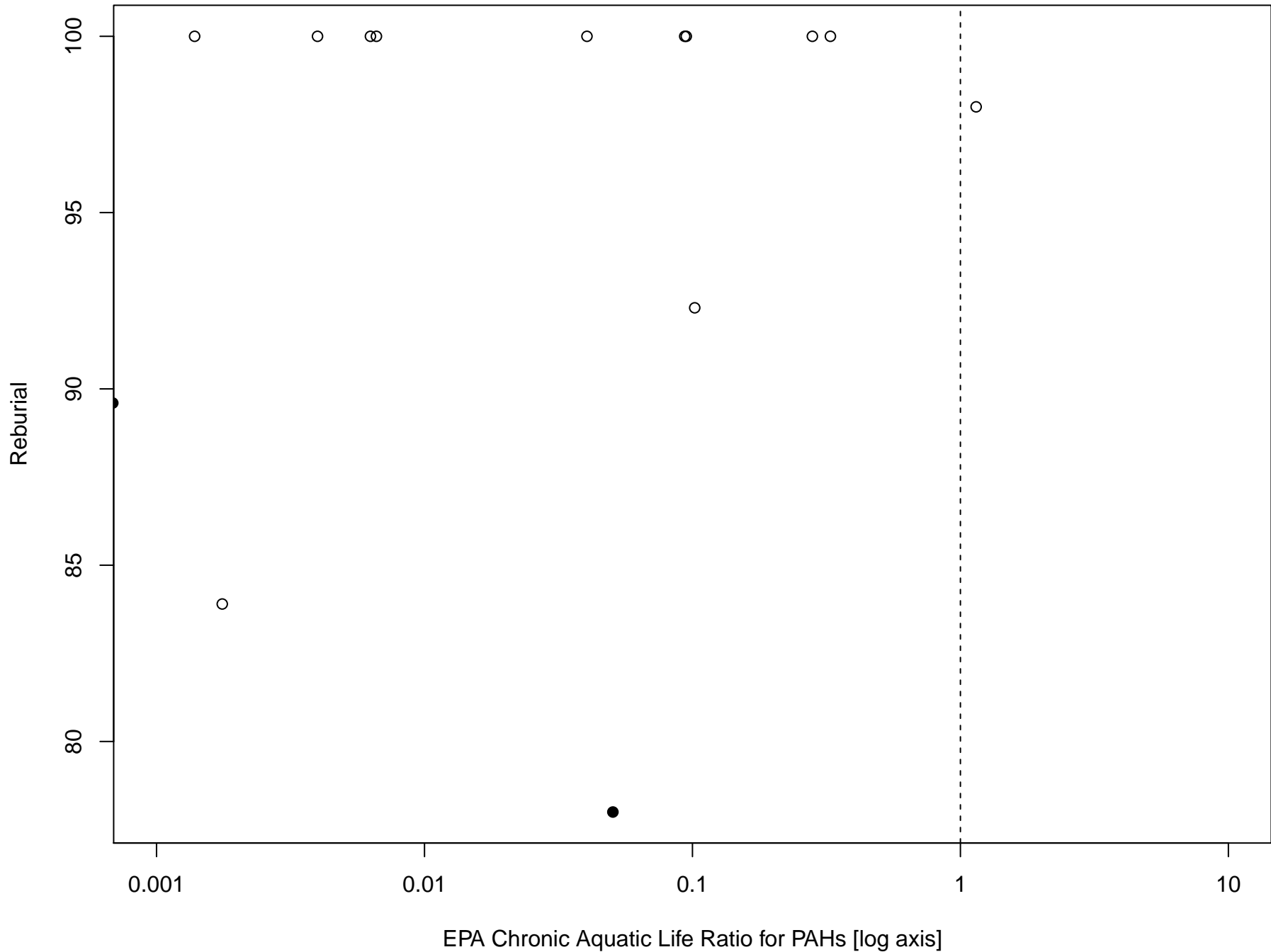
Note: Filled symbols indicate significantly different from the control

Amphipod 10-day sediment test



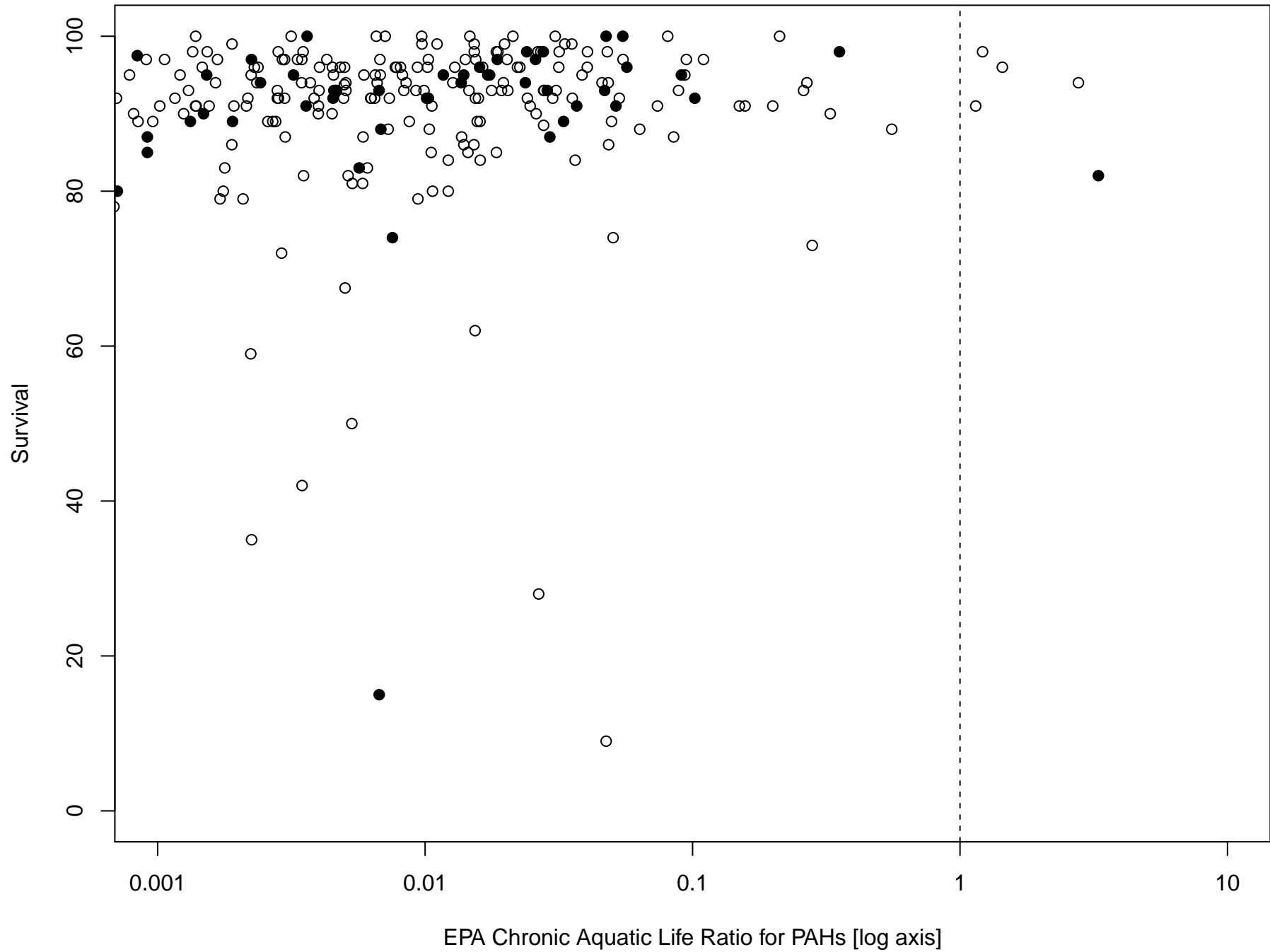
Note: Filled symbols indicate significantly different from the control

Amphipod 10-day sediment test



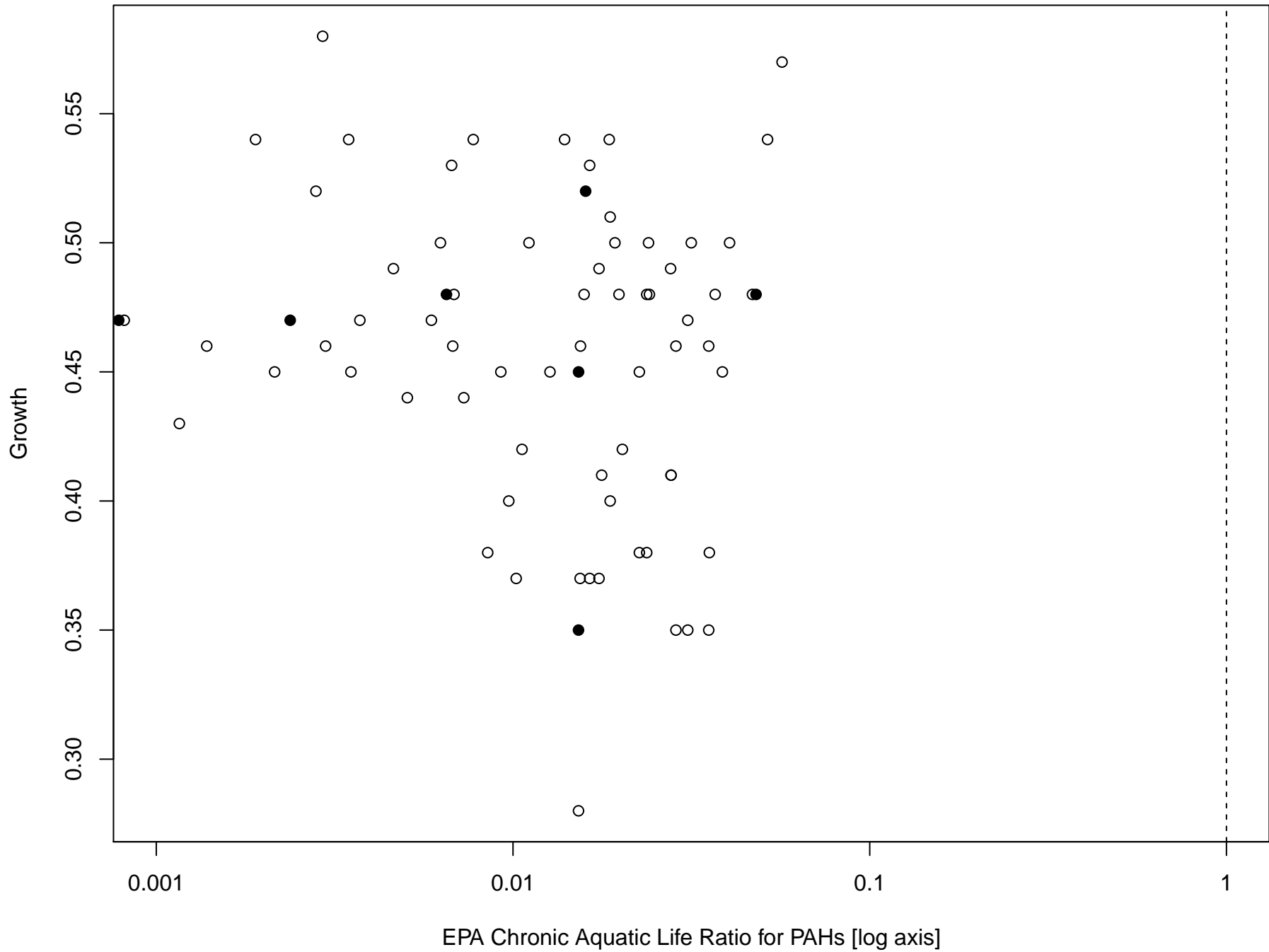
Note: Filled symbols indicate significantly different from the control

Amphipod 10-day sediment test



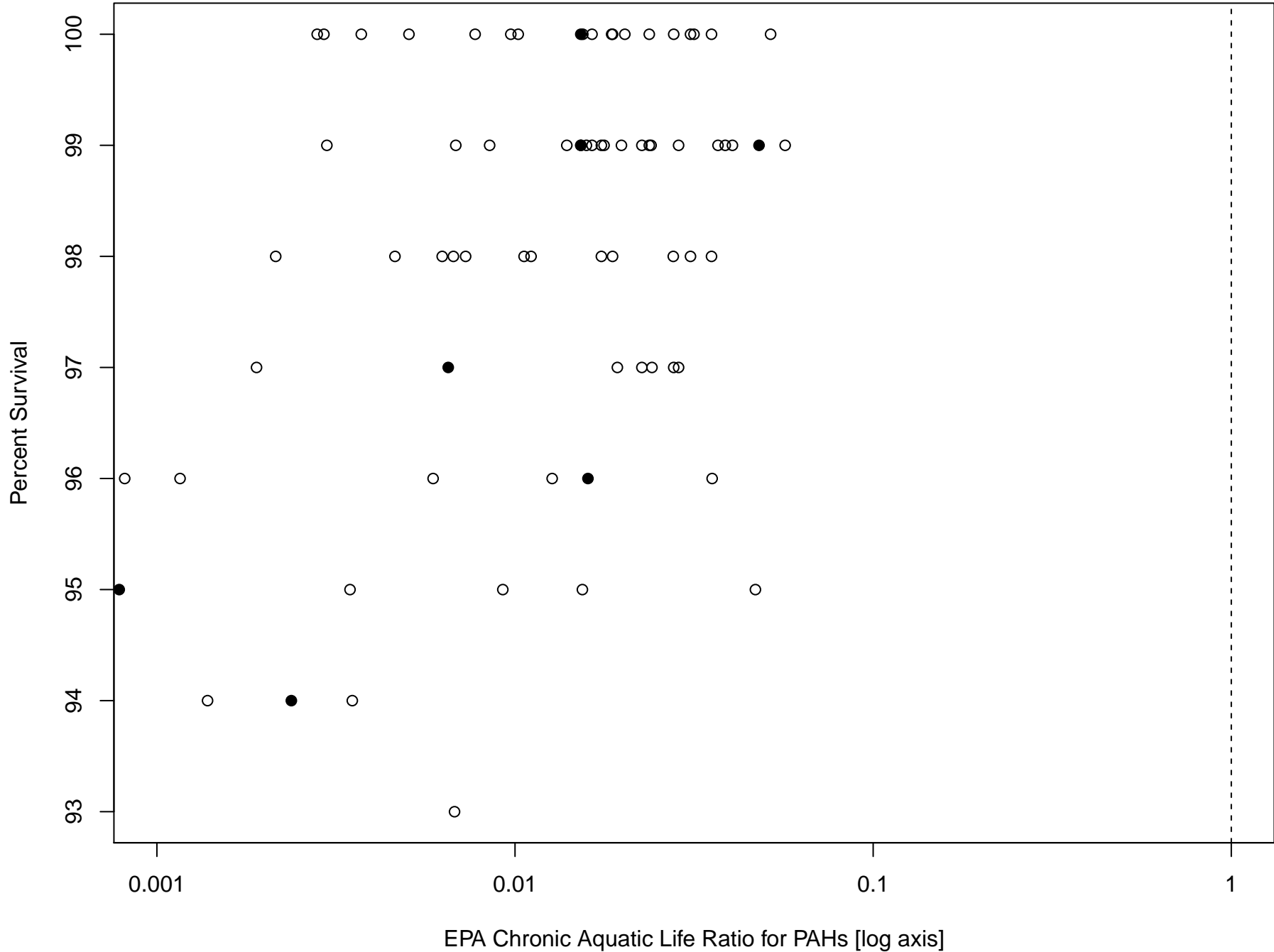
Note: Filled symbols indicate significantly different from the control

Amphipod 96-hour sediment test



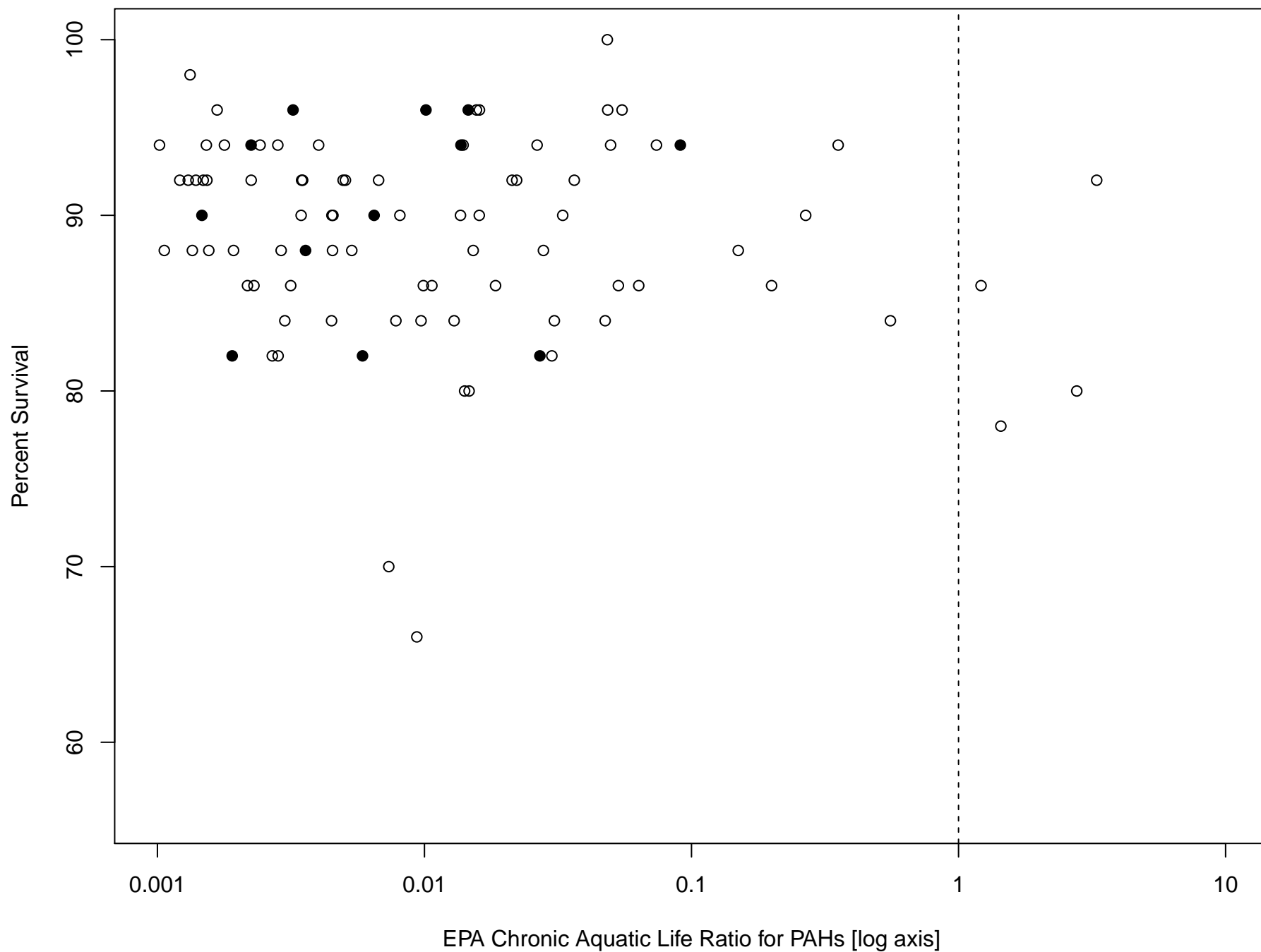
Note: Filled symbols indicate significantly different from the control

Amphipod 96-hour sediment test



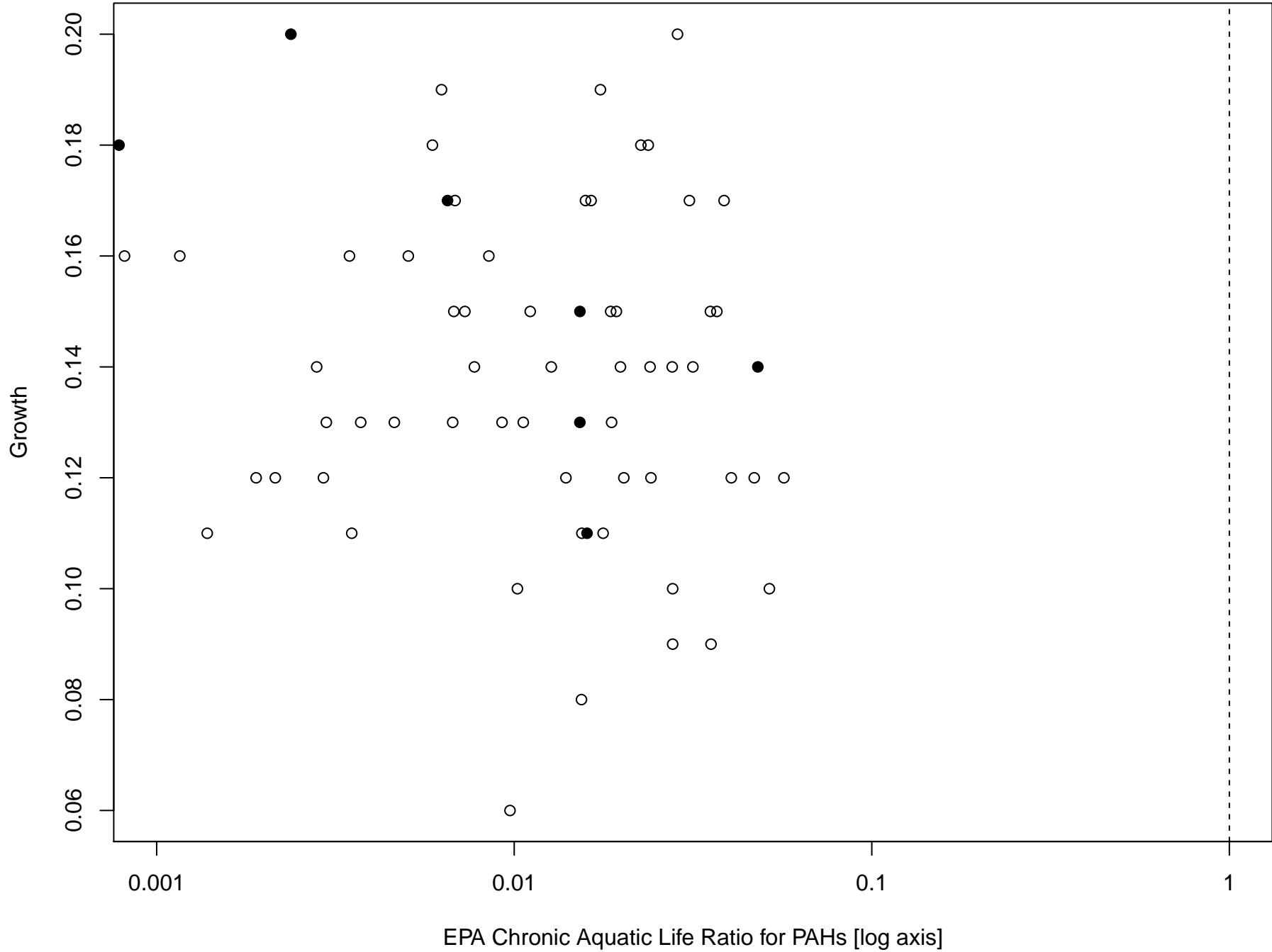
Note: Filled symbols indicate significantly different from the control

Mysid 48-hour sediment test



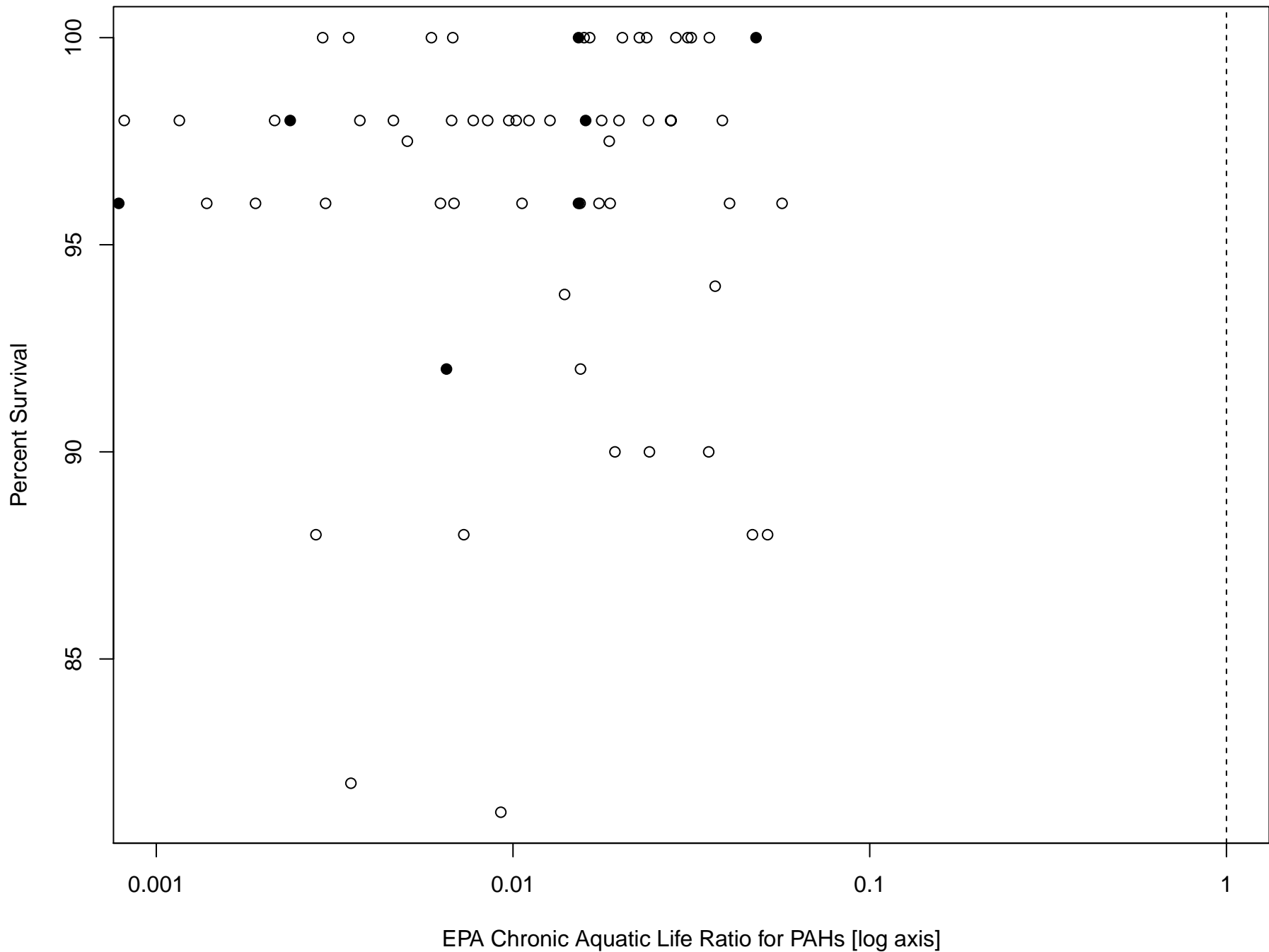
Note: Filled symbols indicate significantly different from the control

Mysid 96-hour sediment test



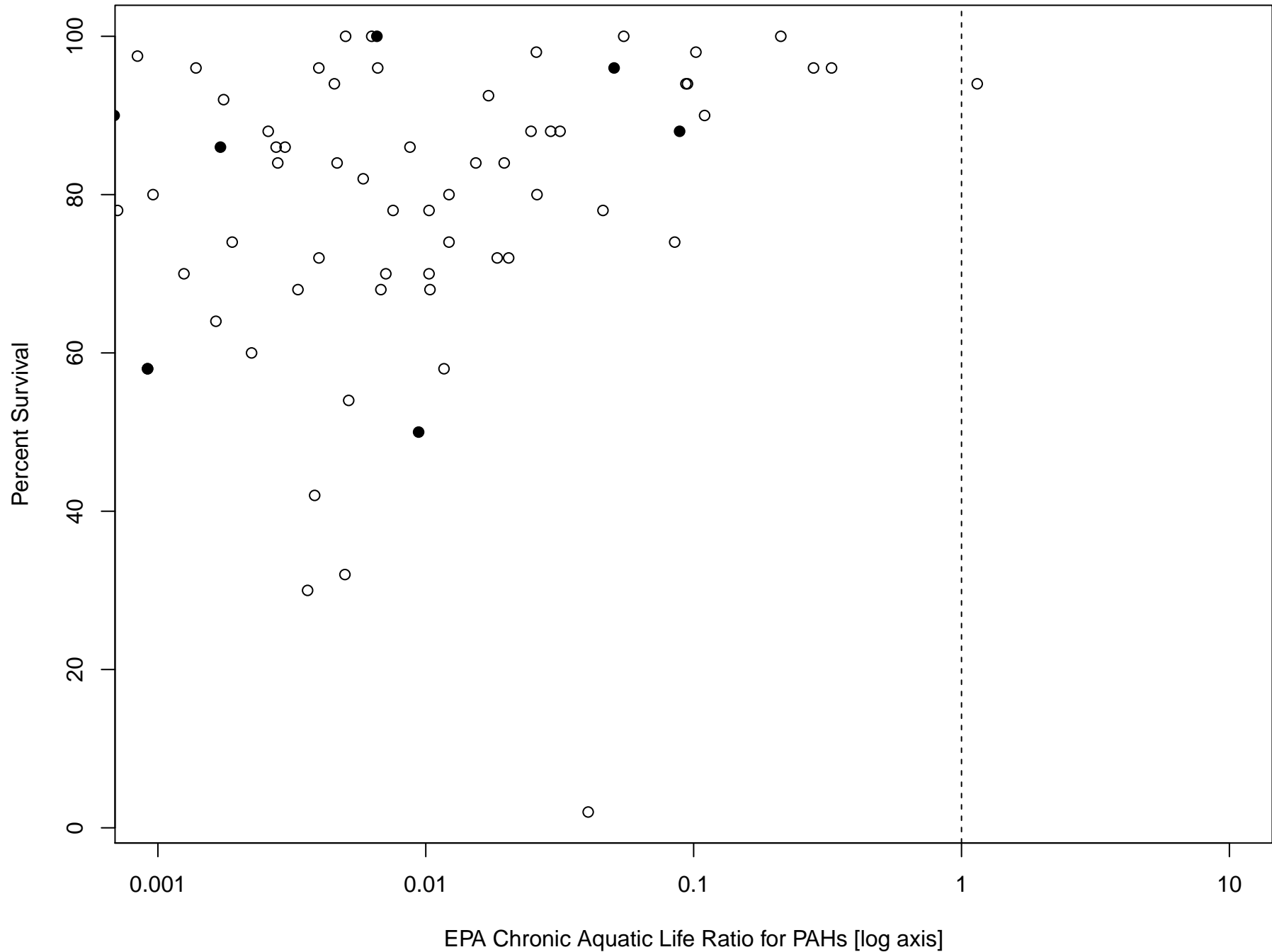
Note: Filled symbols indicate significantly different from the control

Mysid 96-hour sediment test



Note: Filled symbols indicate significantly different from the control

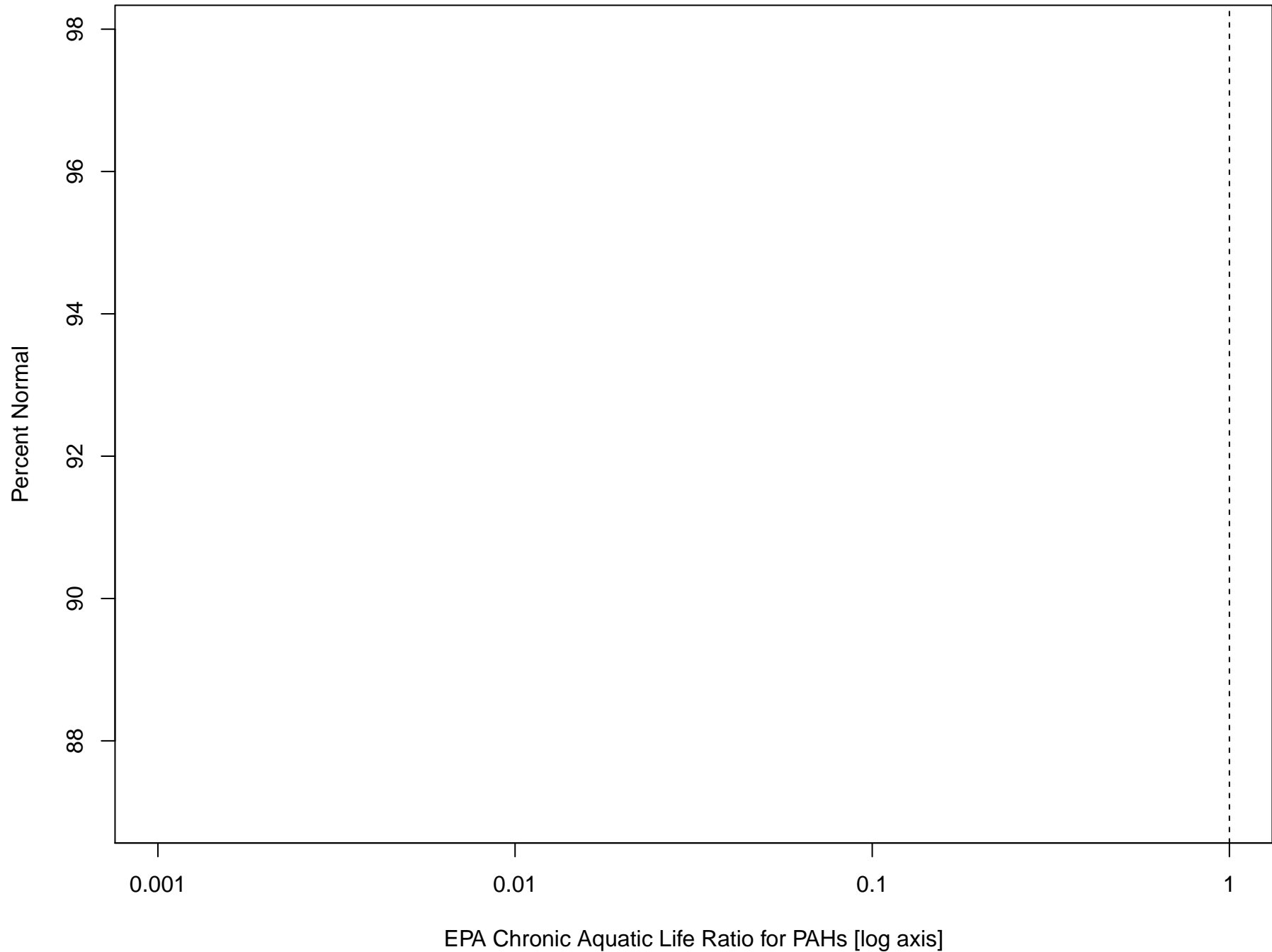
Worm 10-day sediment test



Note: Filled symbols indicate significantly different from the control

Oyster 48-hour surface water test

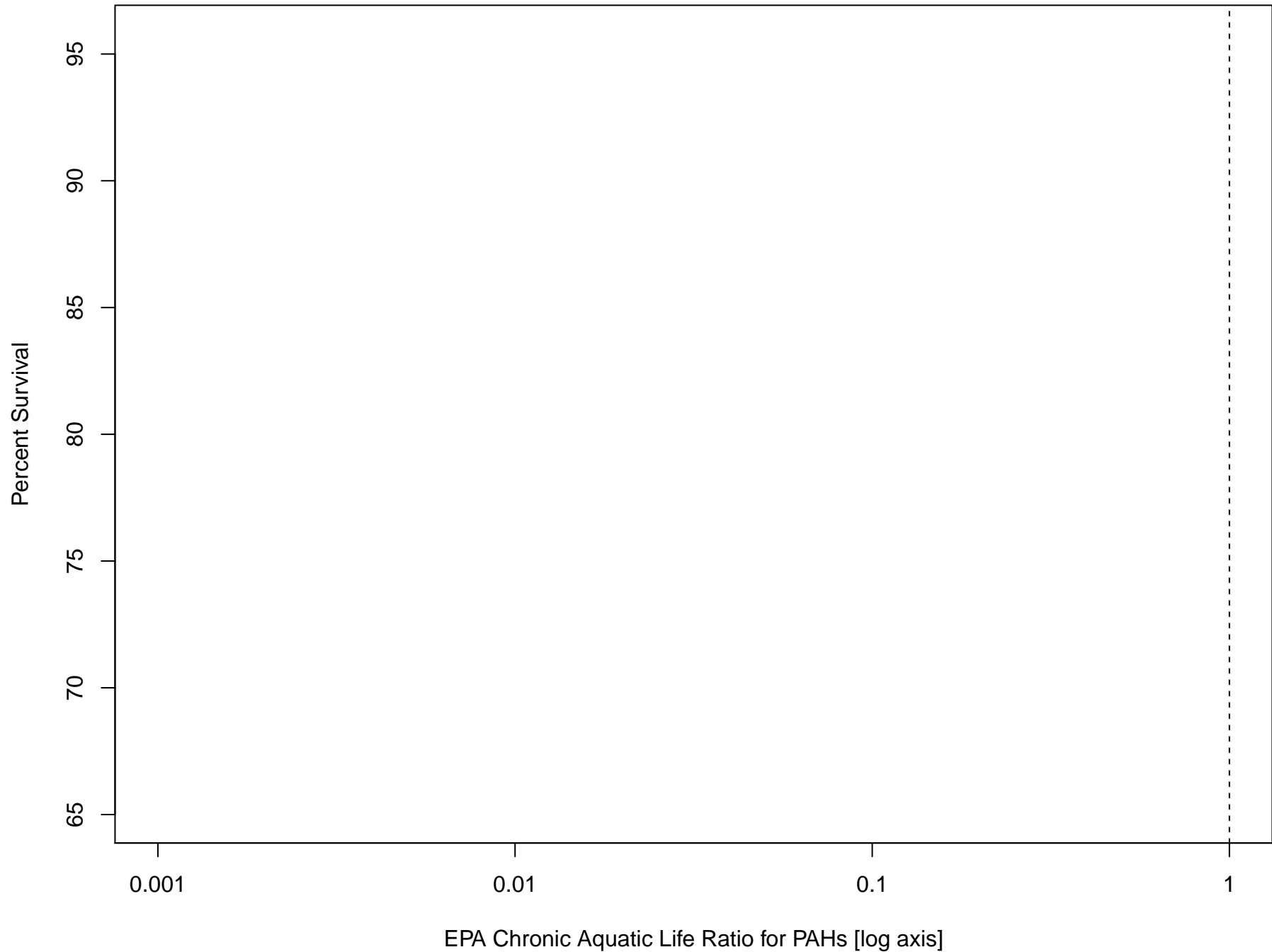
No detected results for analytes included in the benchmark ratio



Note: Filled symbols indicate significantly different from the control

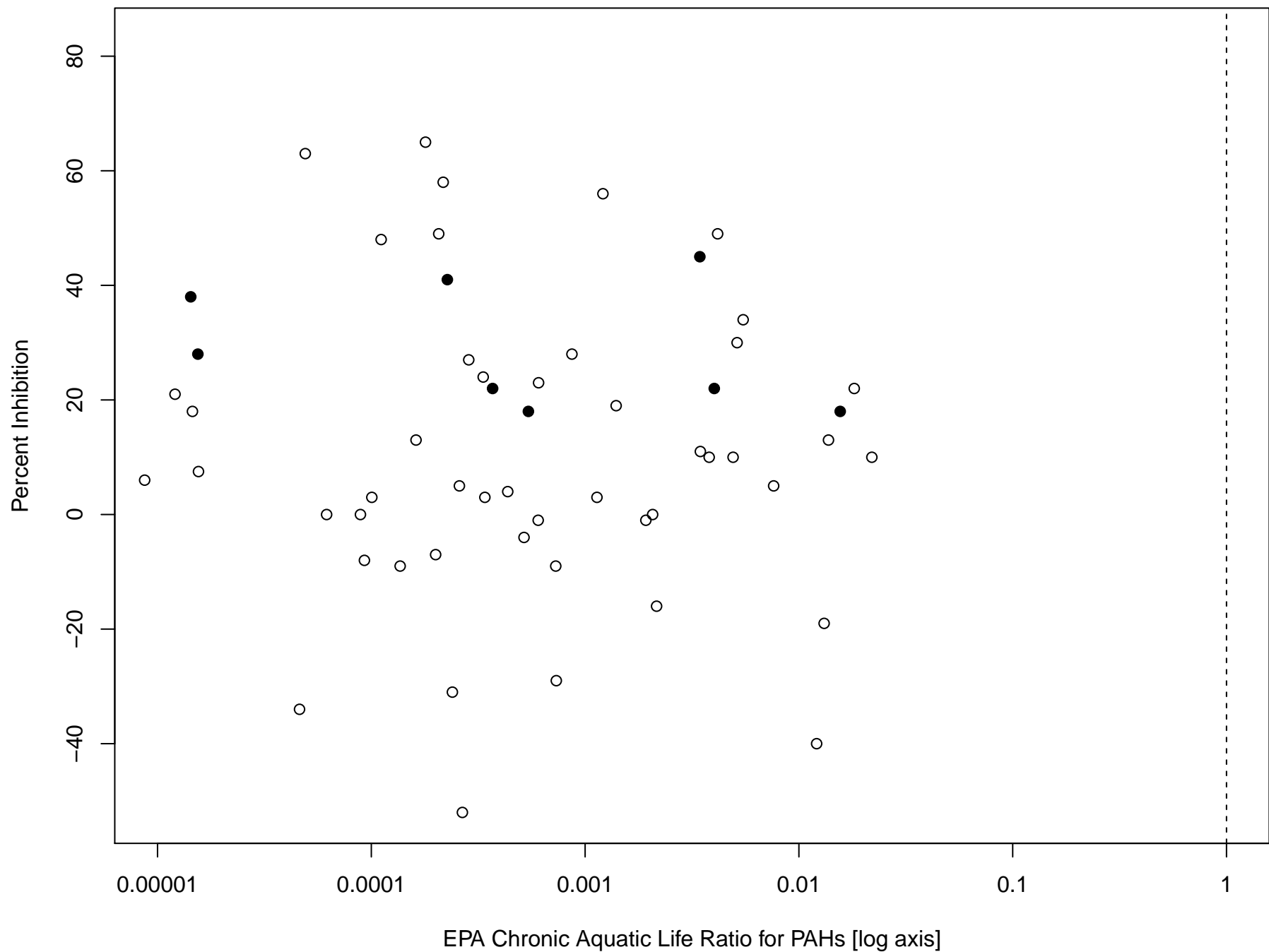
Oyster 48-hour surface water test

No detected results for analytes included in the benchmark ratio



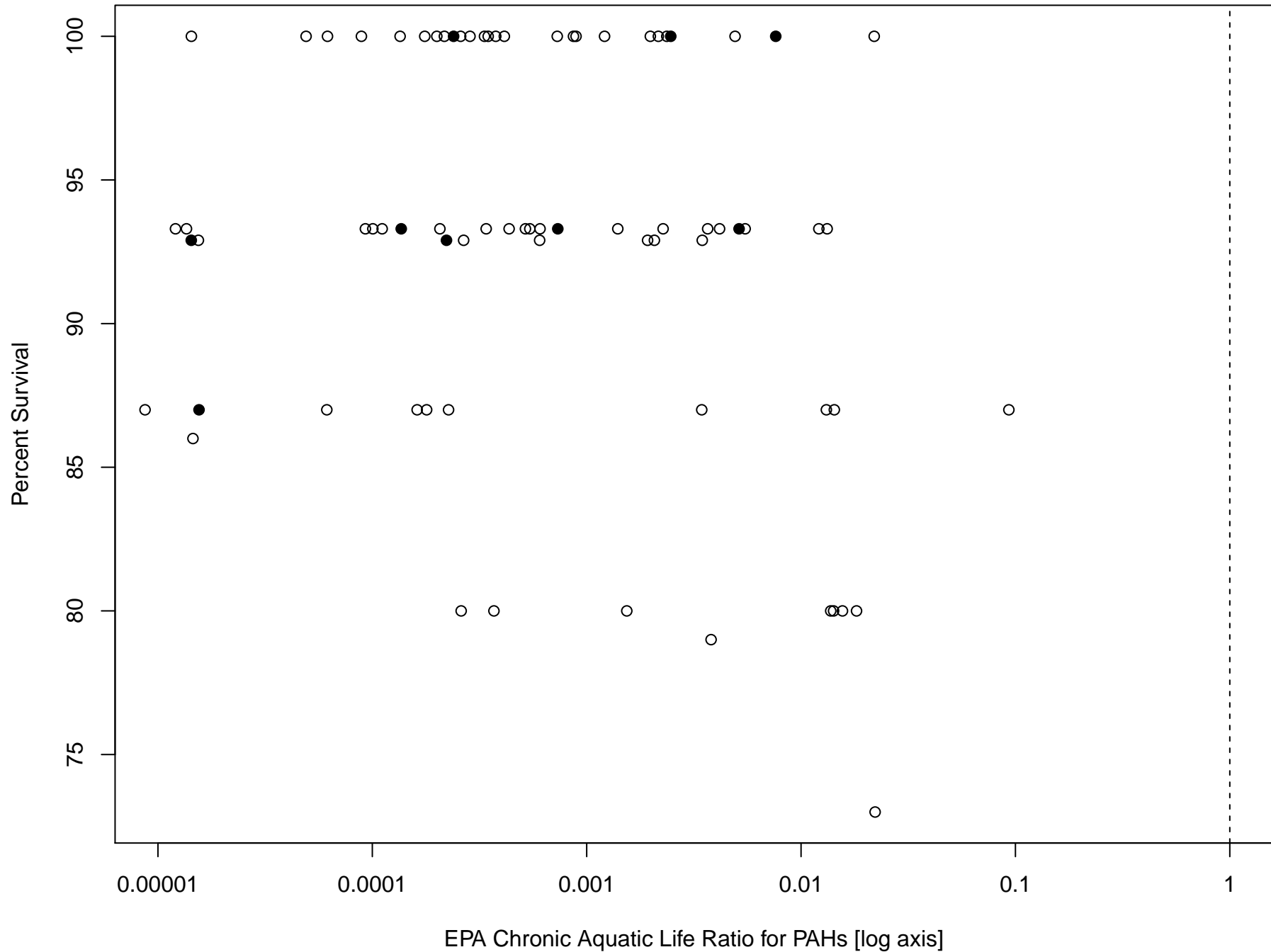
Note: Filled symbols indicate significantly different from the control

Algae 96-hour surface water test



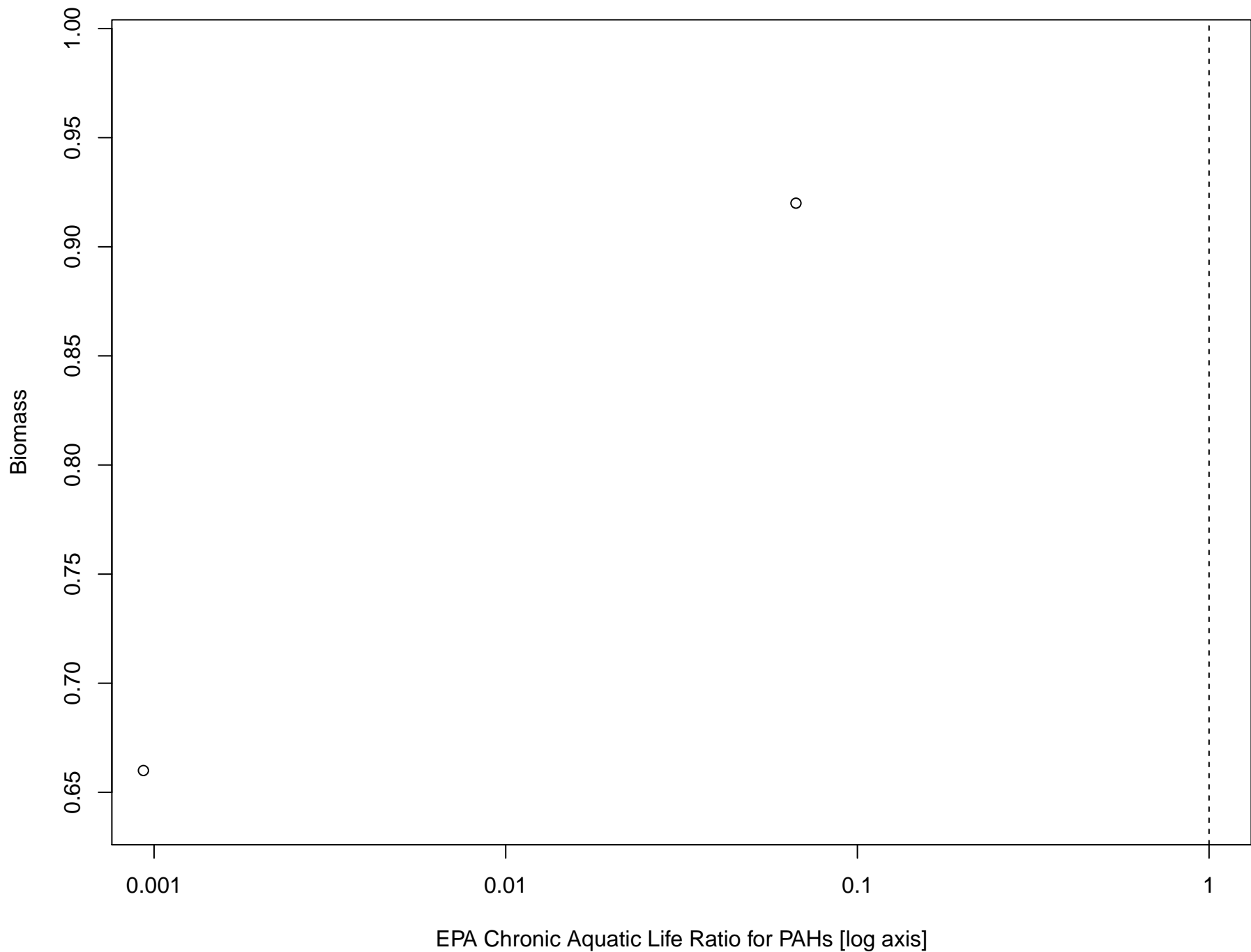
Note: Filled symbols indicate significantly different from the control

Pink shrimp 7-day surface water test



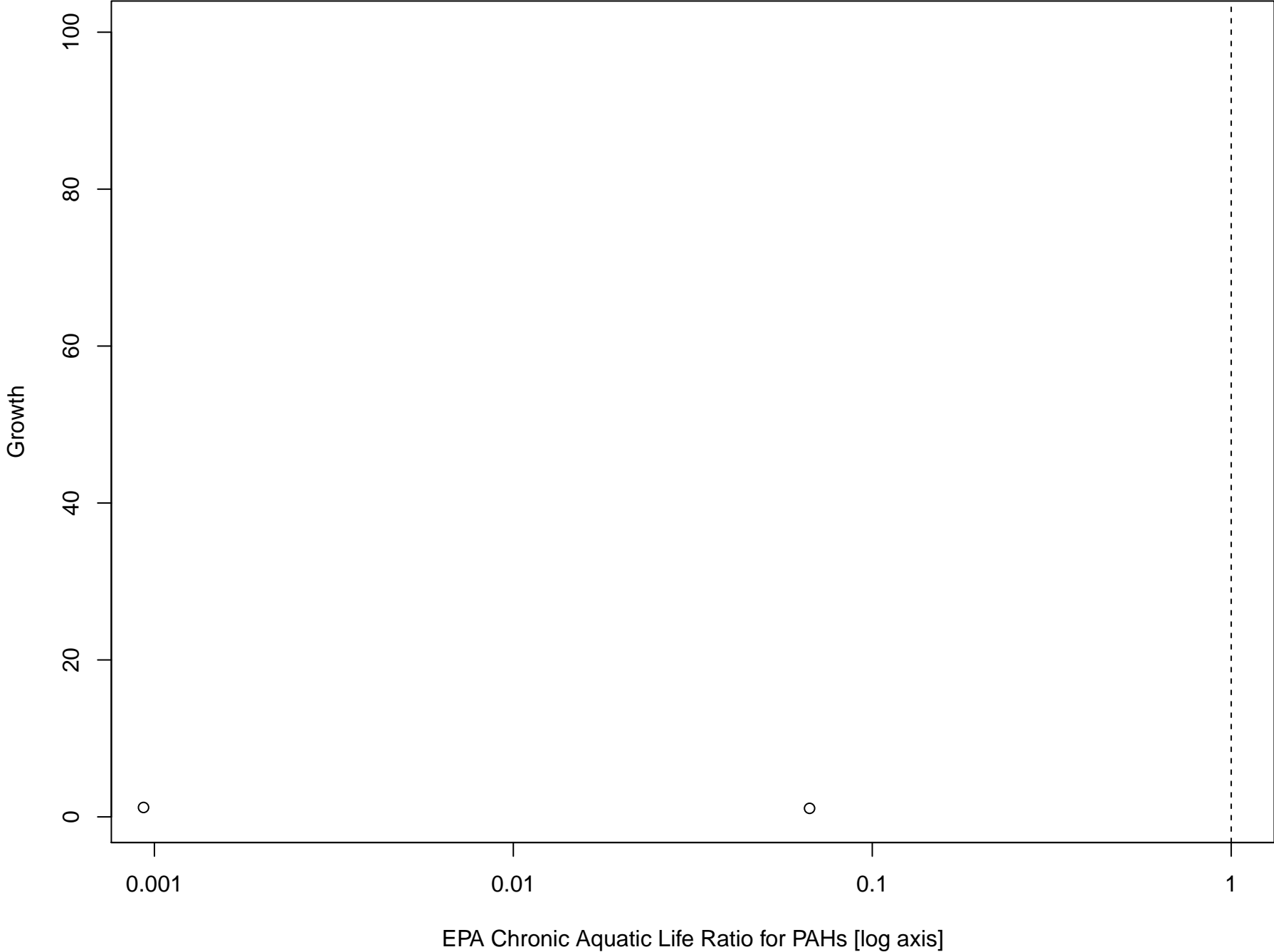
Note: Filled symbols indicate significantly different from the control

Fish 7-day surface water test



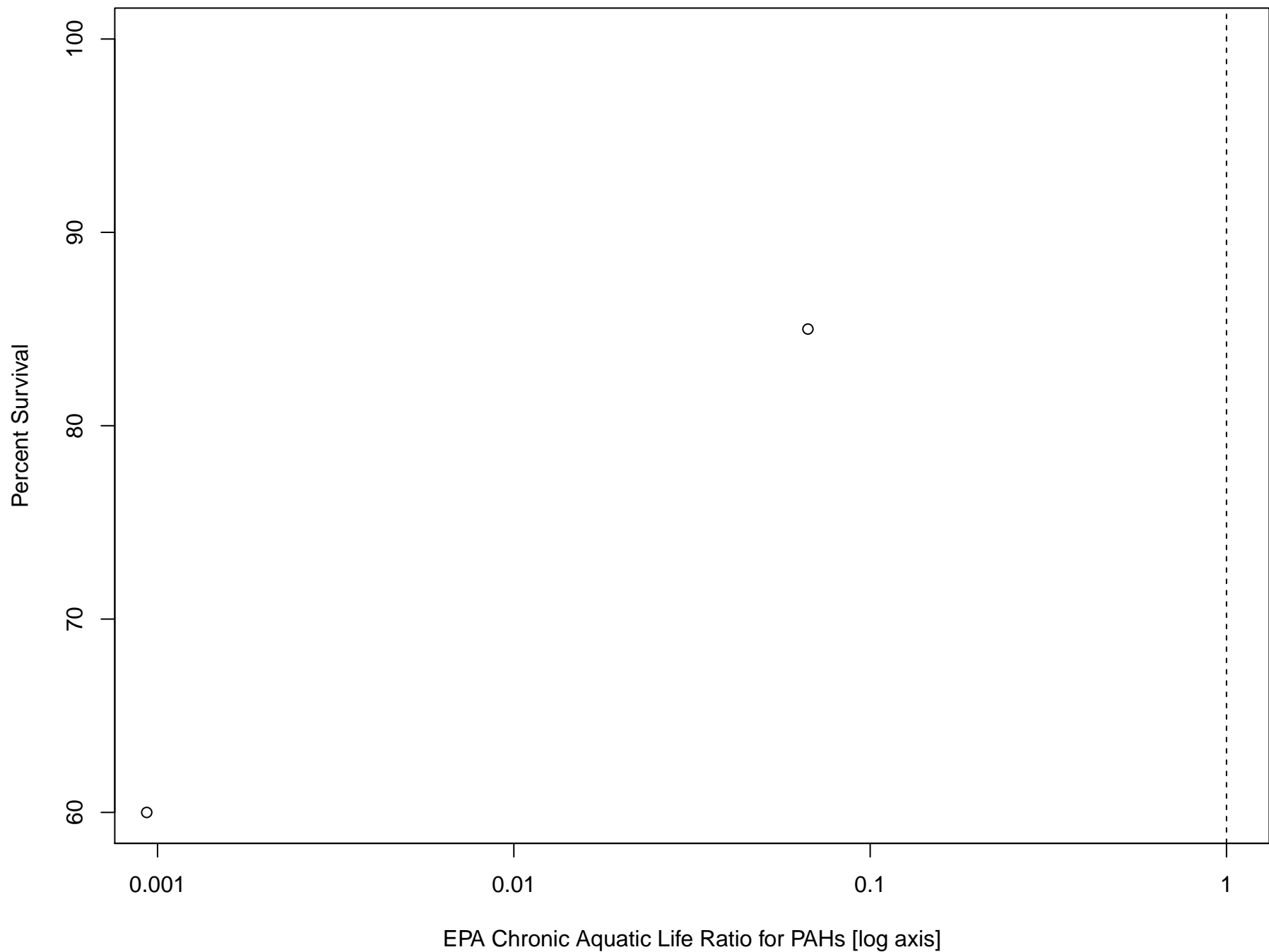
Note: Filled symbols indicate significantly different from the control

Fish 7-day surface water test



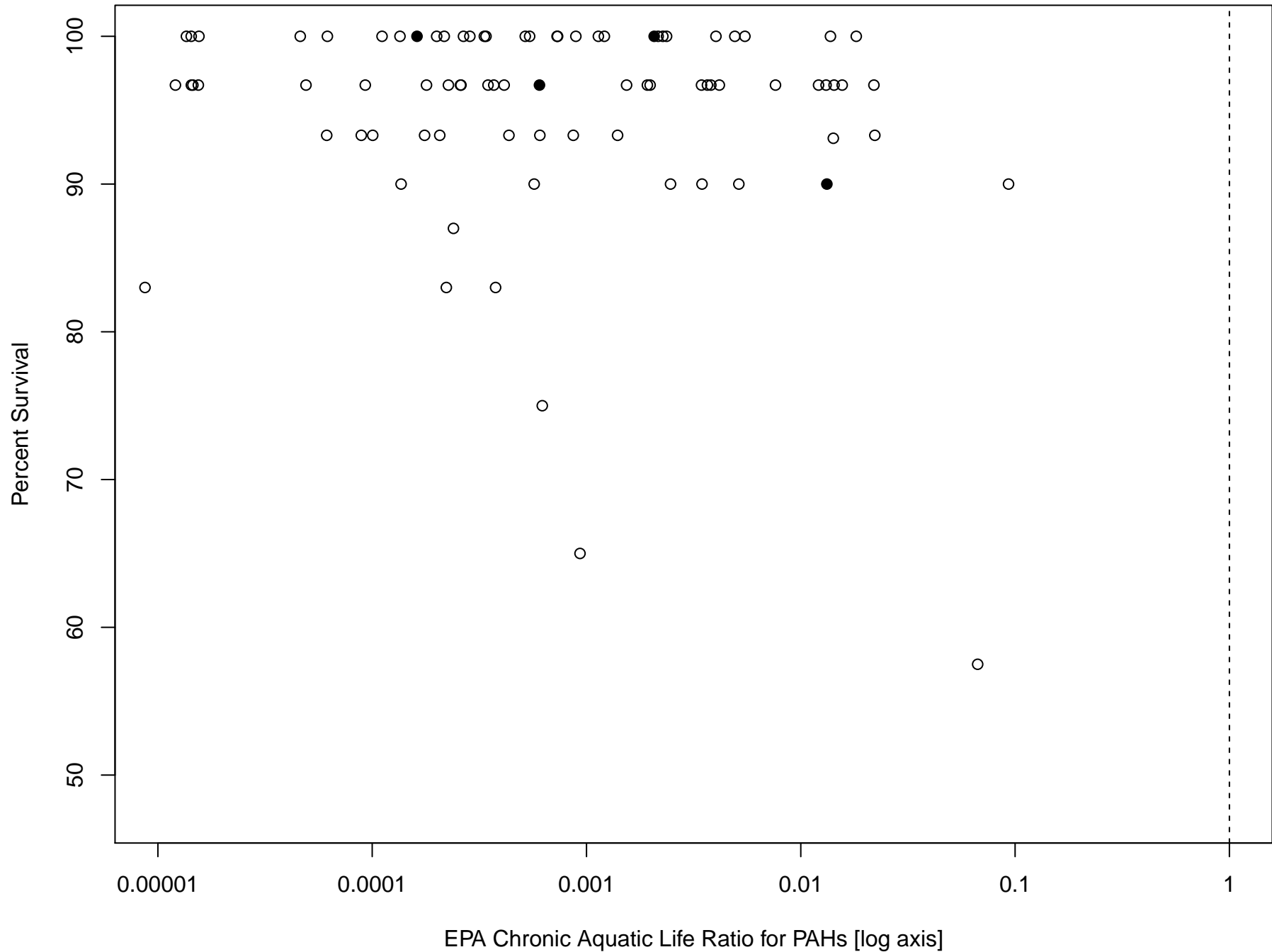
Note: Filled symbols indicate significantly different from the control

Fish 7-day surface water test



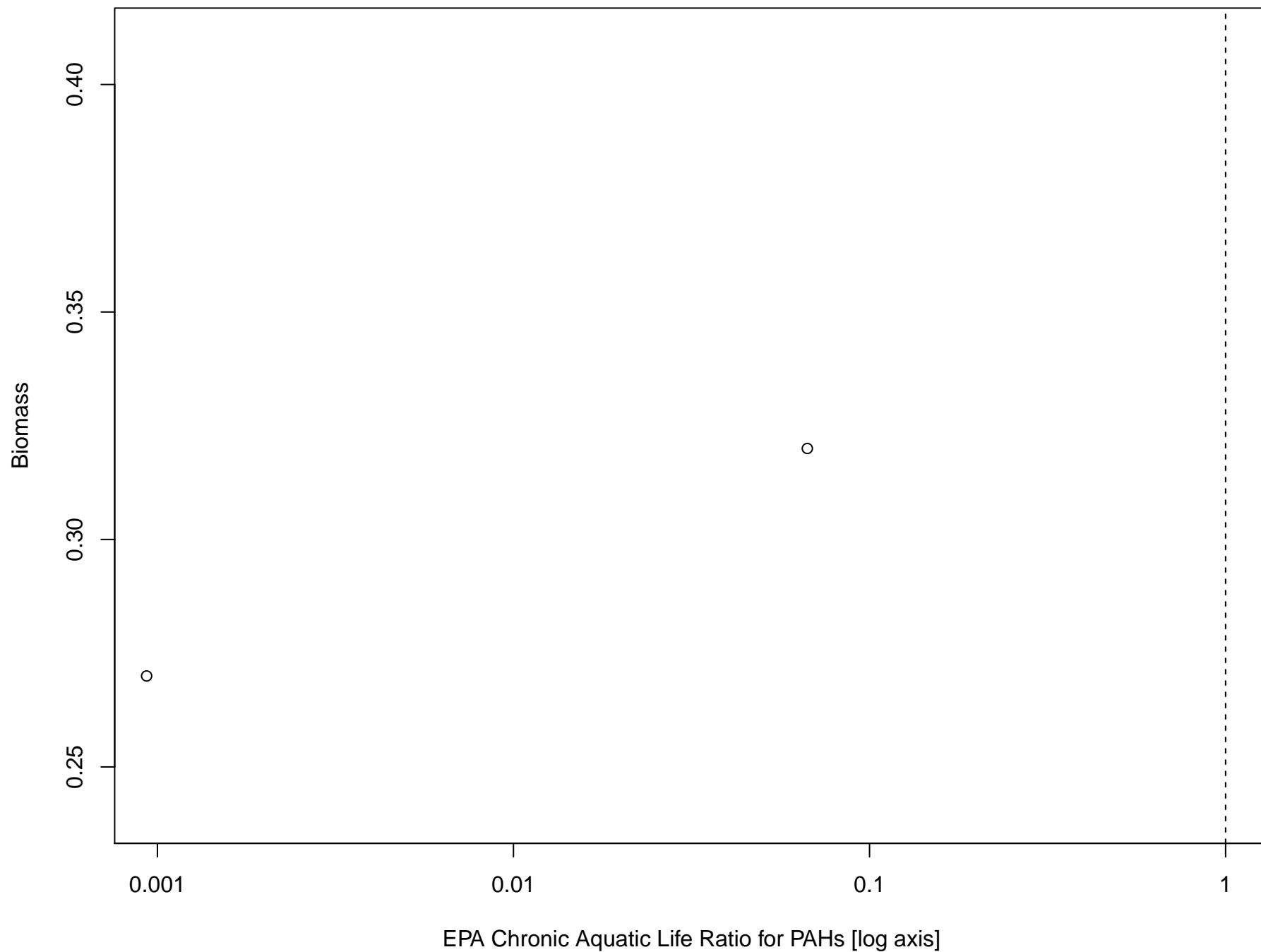
Note: Filled symbols indicate significantly different from the control

Fish 96-hour surface water test



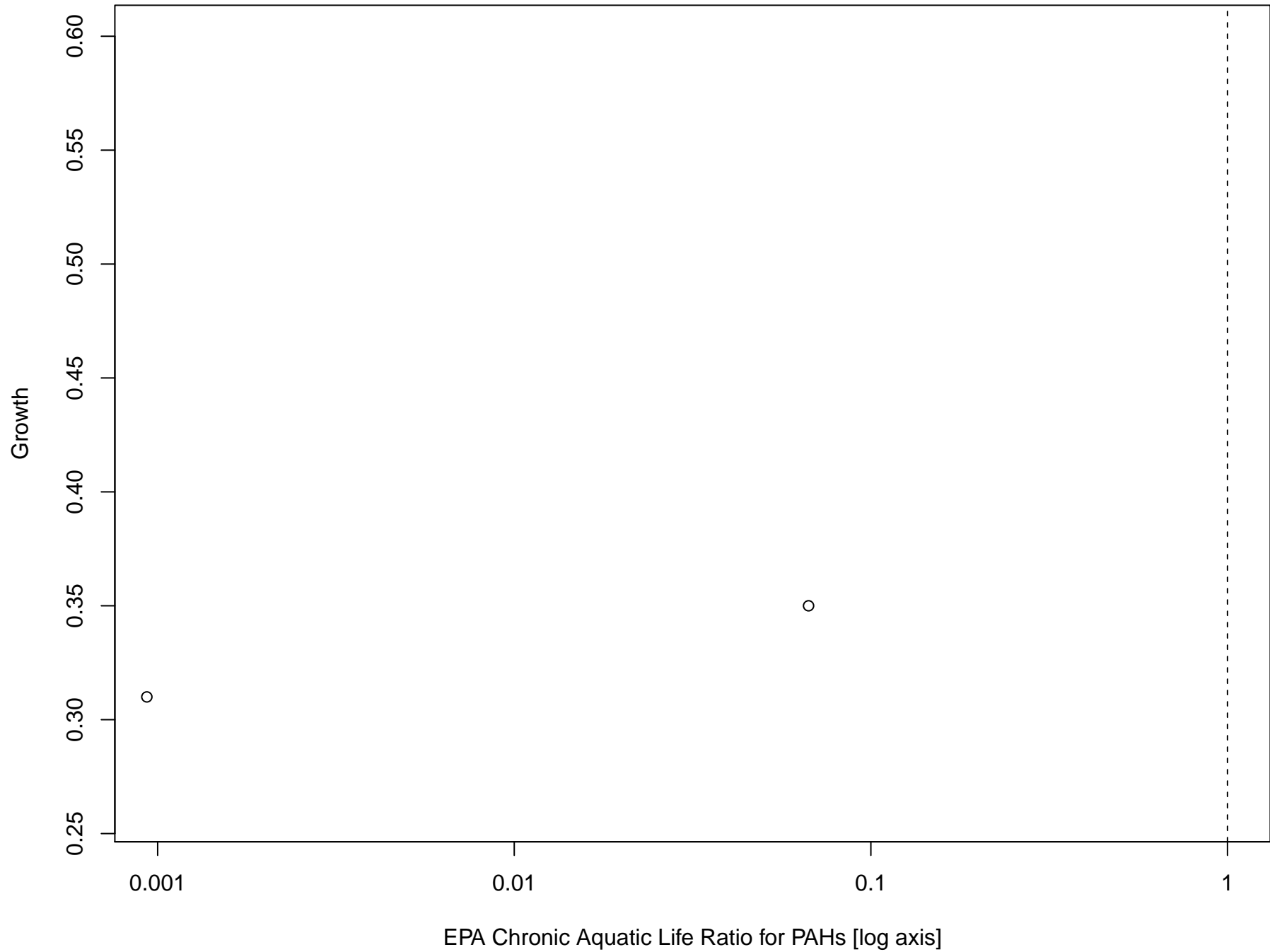
Note: Filled symbols indicate significantly different from the control

Mysid 7-day surface water test



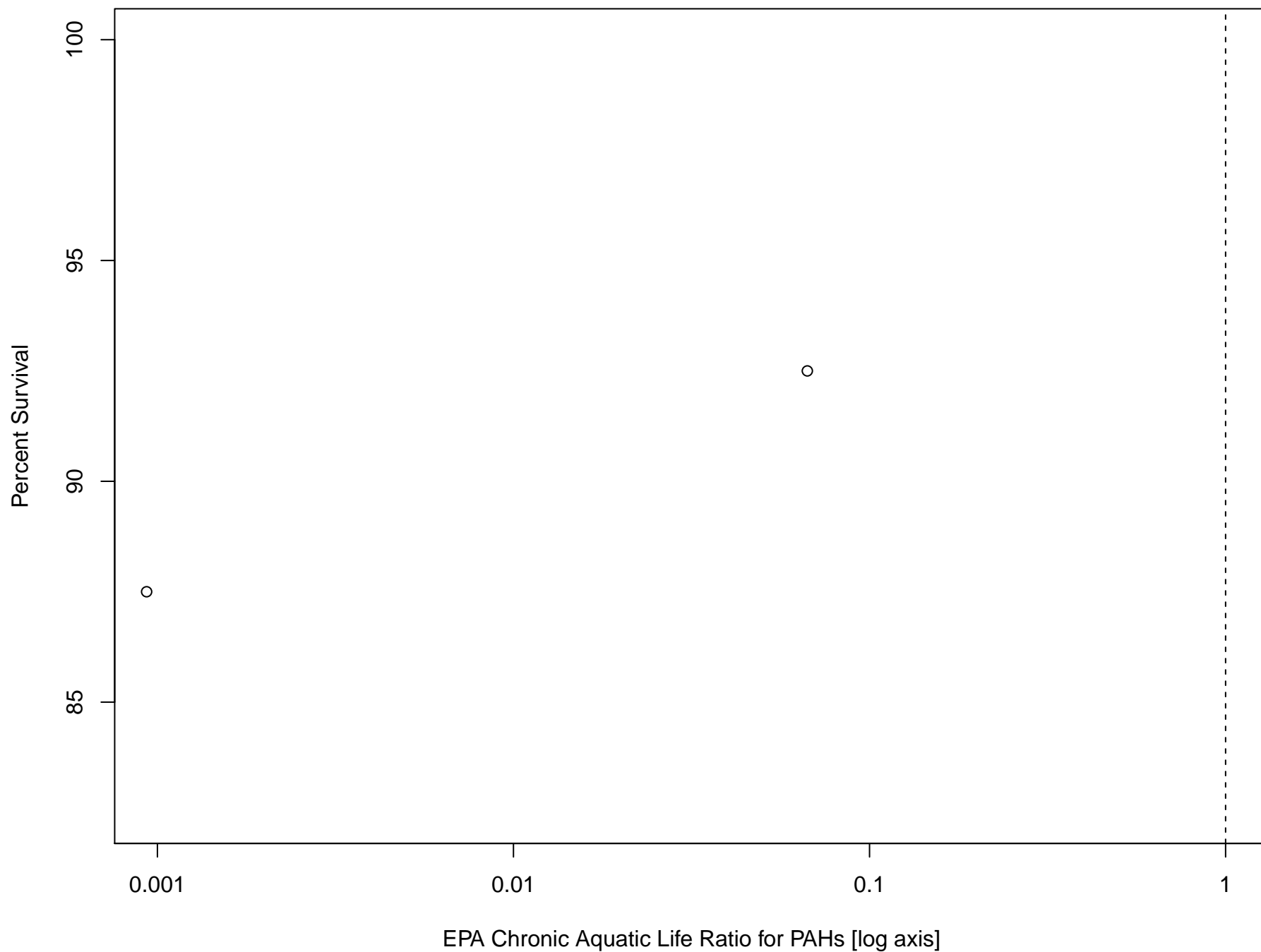
Note: Filled symbols indicate significantly different from the control

Mysid 7-day surface water test



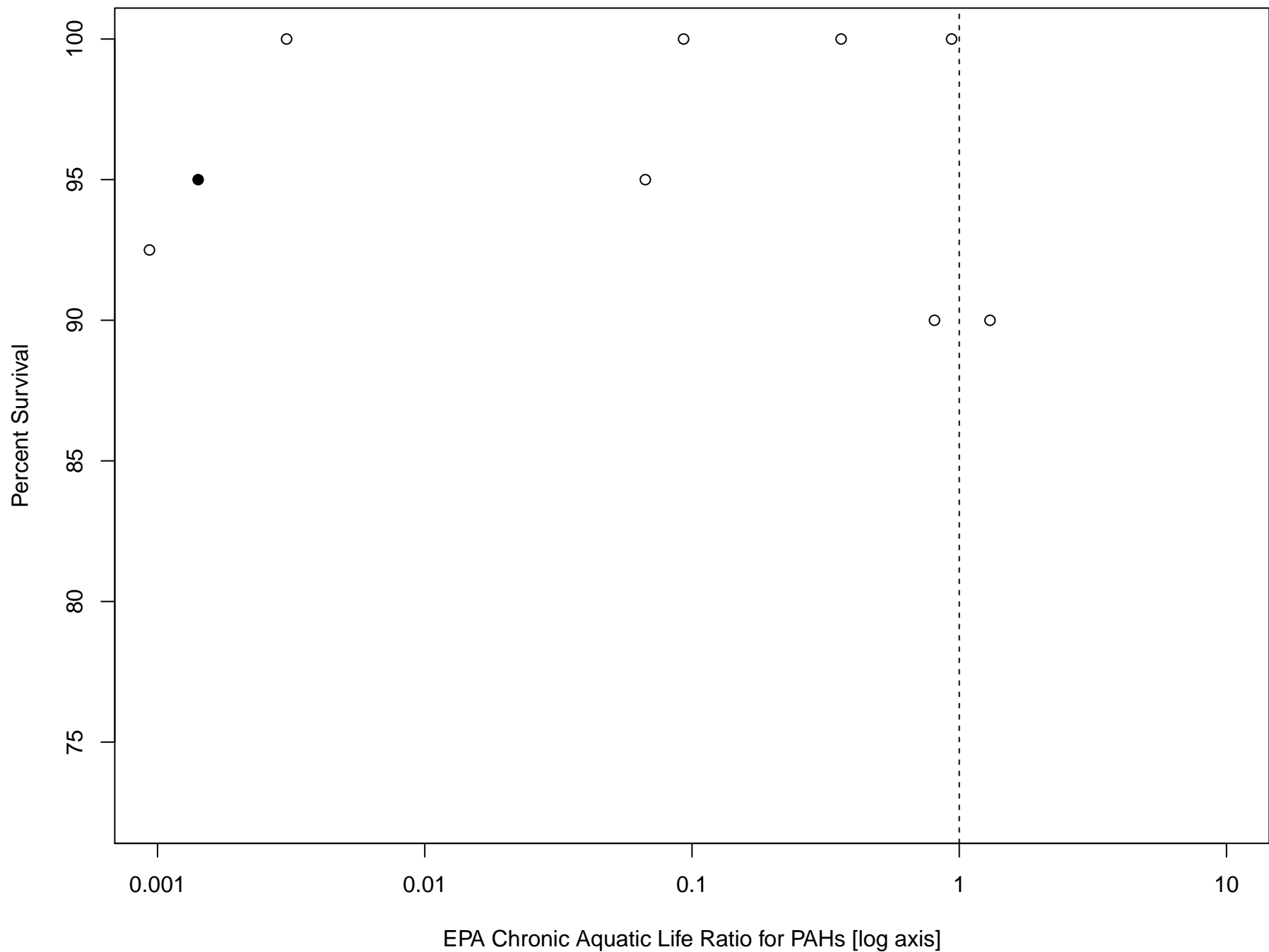
Note: Filled symbols indicate significantly different from the control

Mysid 7-day surface water test



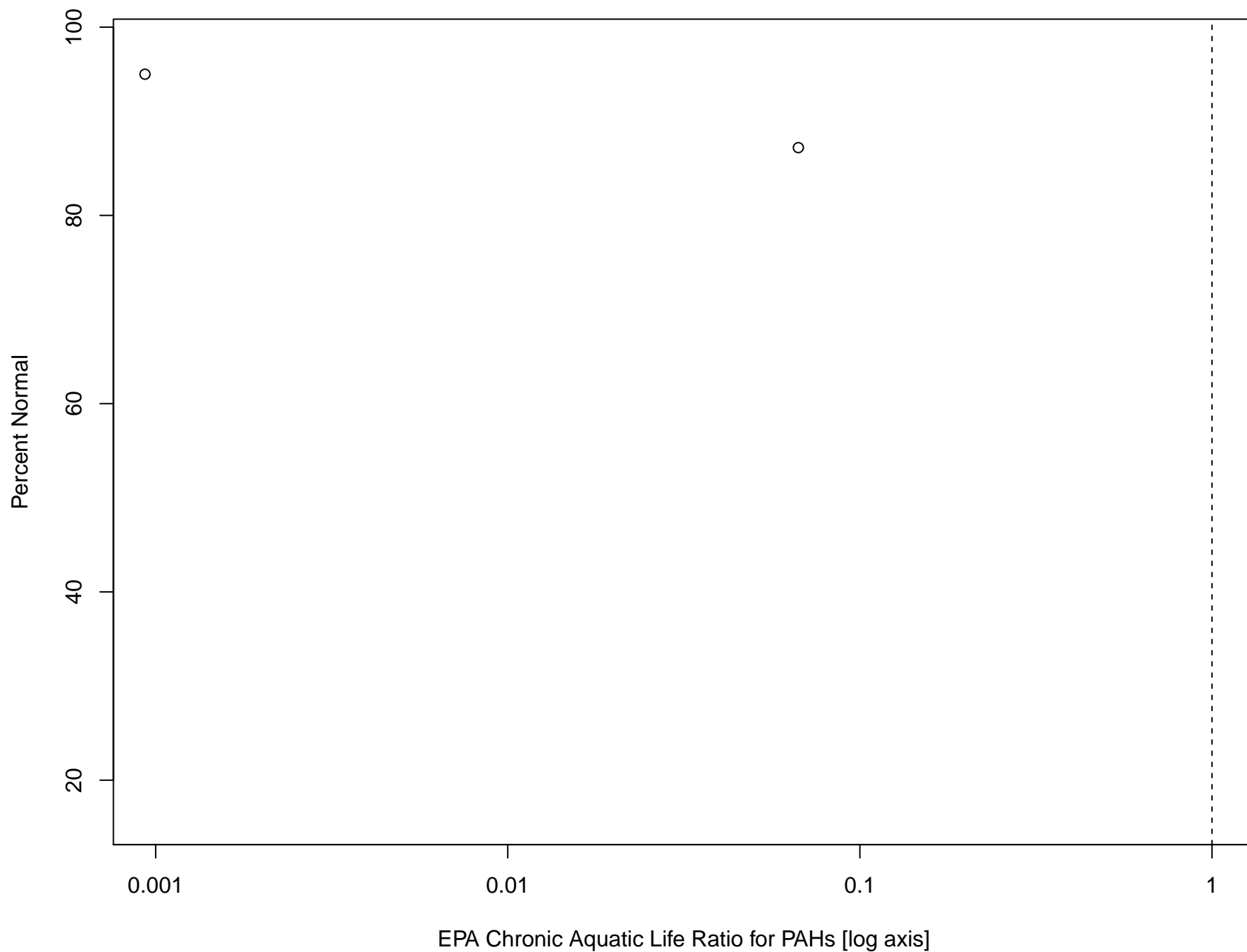
Note: Filled symbols indicate significantly different from the control

Mysid 96-hour surface water test



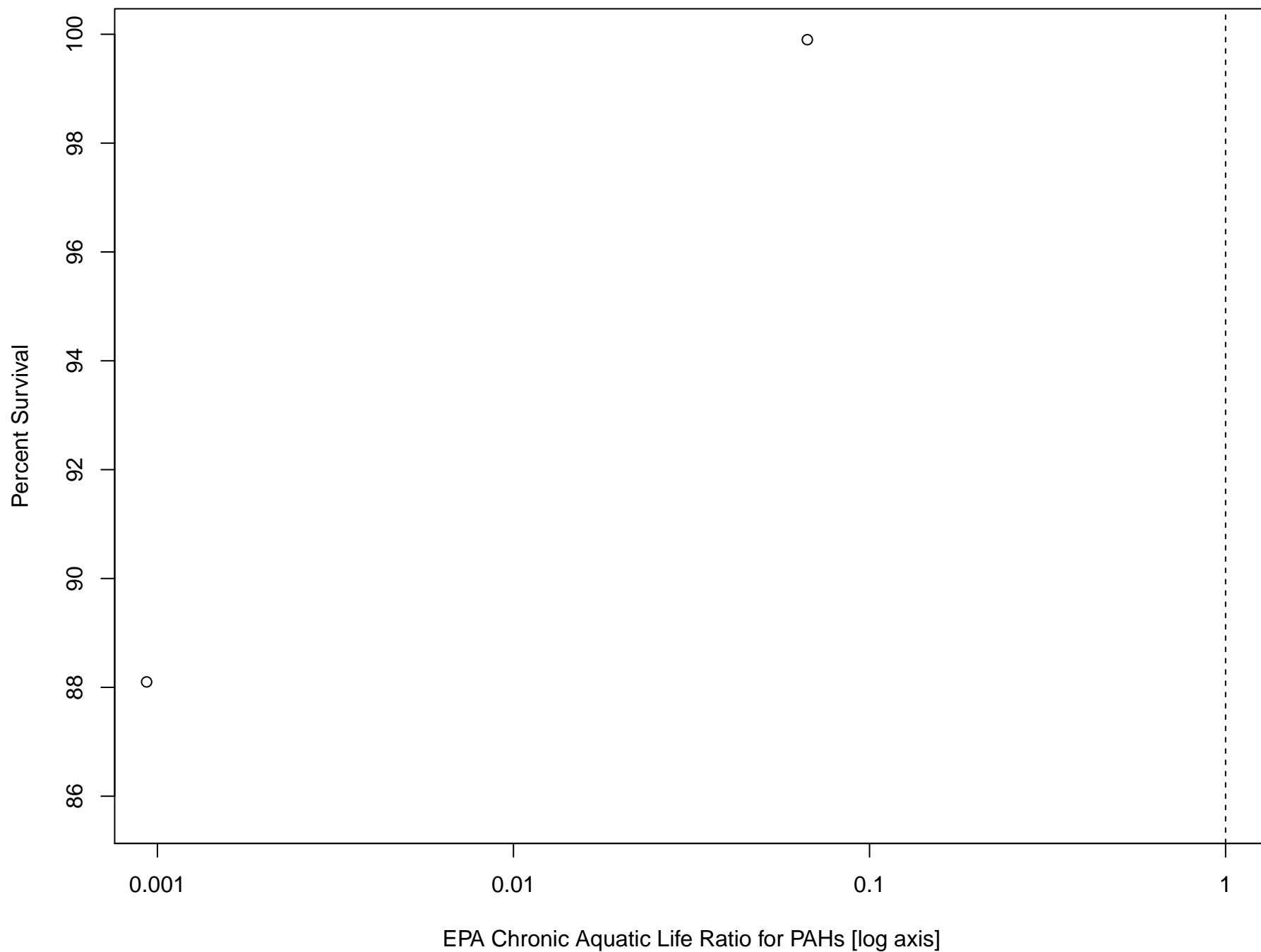
Note: Filled symbols indicate significantly different from the control

Mussel 48-hour surface water test



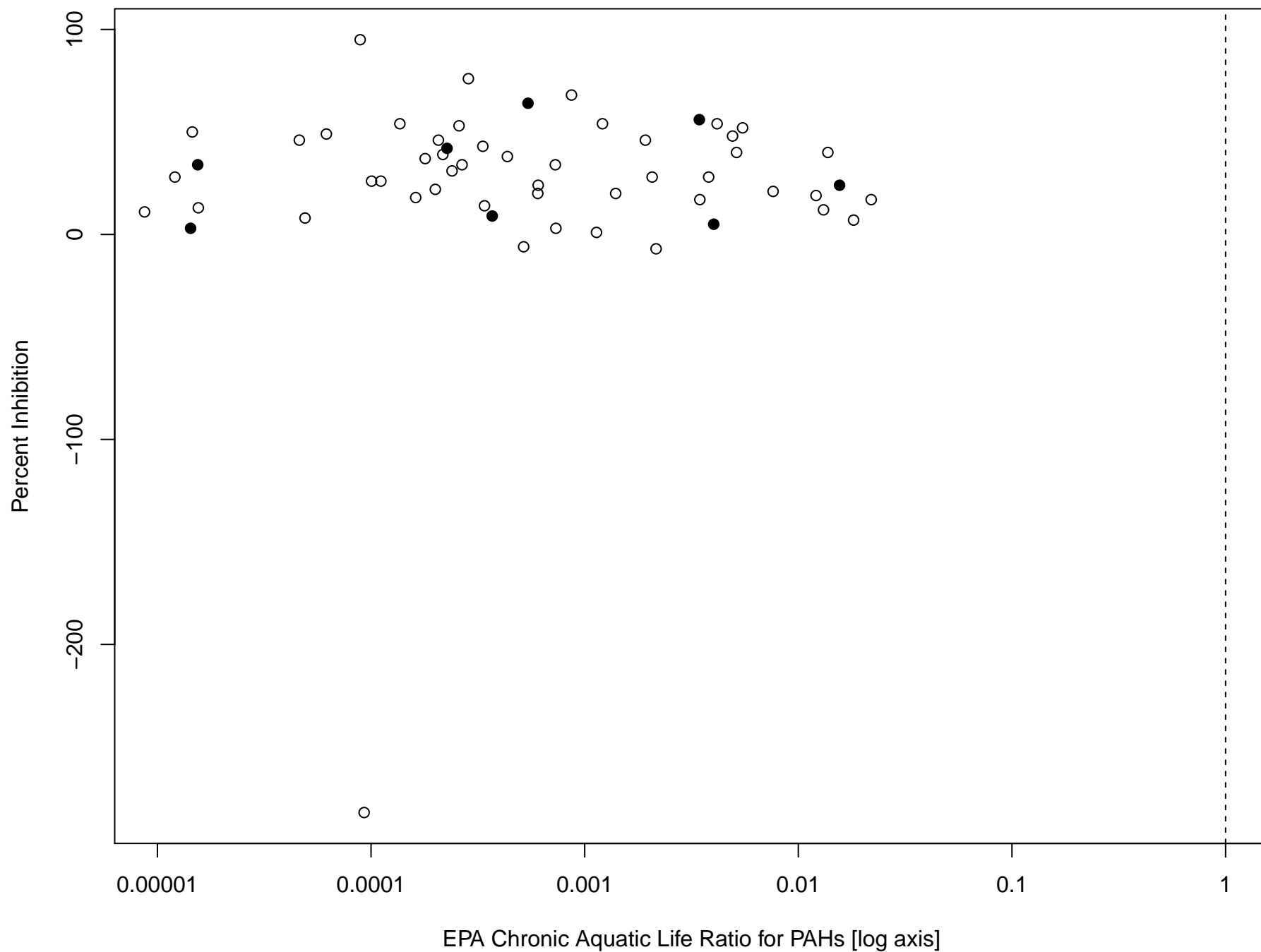
Note: Filled symbols indicate significantly different from the control

Mussel 48-hour surface water test



Note: Filled symbols indicate significantly different from the control

Diatom 96-hour surface water test



Note: Filled symbols indicate significantly different from the control

Appendix C: Sample Fingerprinting

Appendix C describes the data evaluation process used by OSAT to determine the source of analytes present in water and sediment samples that exceeded EPA's chronic aquatic benchmark for polycyclic aromatic hydrocarbons (PAHs). Additional characterizations were performed on sediment samples that did not exceed the EPA's chronic aquatic benchmark for PAHs, but had total PAH concentrations $<0.58 \mu\text{g/g}$ [580 ppb] in sediment, $<0.18 \mu\text{g/L}$ [0.18 ppb] in water).

Prior fingerprinting assessments posted on NOAA's GeoPlatform and reported by USGS (2010) were incorporated into this review. Characterizations were also performed by the USGS (2010) on all of their collected samples. A number of the samples were not fingerprinted because PAH concentrations were undetectable or at the limits of detecting, making sample characterization unfeasible.

In general, the focus of the evaluation was on determining whether exceedance samples were "characteristic" or "not characteristic" of MC252 oil, with some samples remaining of indeterminate origin when not enough data was available. Samples whose source was indeterminate were considered as characteristic of MC252 in all plots and tabulations of exceedances within this report. Depending on the analytes available for a sample, different methods were used for source determination. The following describes source determination for samples containing only priority pollutant PAHs and for full-alkyl PAH samples.

C.1 Types of PAH Samples

Two types of PAH sample data were available for the water and sediment samples, priority pollutant (PP) PAH and full alkyl PAH. The evaluation process to determine the presence of MC252-based hydrocarbons for samples with exceedances of EPA's chronic aquatic life ratio for PAHs differed based on whether PP PAH or alkyl PAH data were available. A description of the procedure for each of the two data types is described below.

C.2 Priority Pollutant PAH Samples

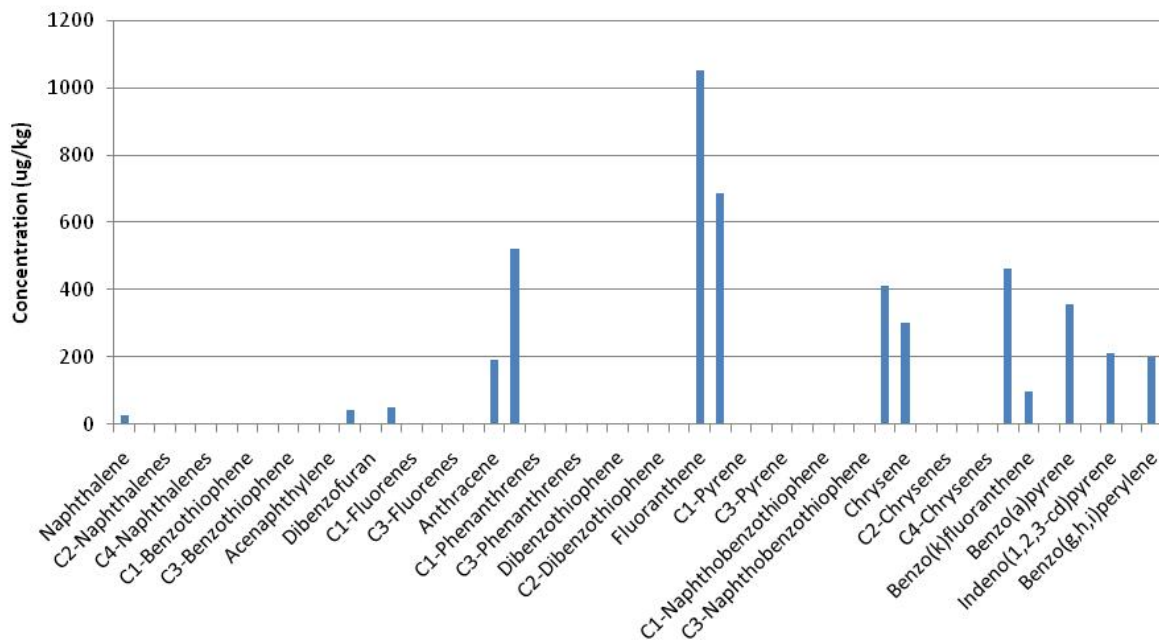
The first step was to evaluate the distribution of PAHs in the sample using a bar graph of the analyte concentrations. This was done to determine if a) a possible petrogenic (petroleum related) signature was present, or b) a possible pyrogenic (combustion related) signature was present. For water samples, the evaluation included a possible water accommodated fraction distribution.

A petrogenic PAH distribution was interpreted if the PAH analytes present were characteristic of fresh or weathered petroleum. This included the presence of naphthalene, fluorene, and phenanthrene, with lower levels of chrysene. A possible petrogenic WAF was interpreted if naphthalene, fluorene and phenanthrene were present, with a general pattern of naphthalene higher in abundance than fluorene which is higher than phenanthrene. A PP PAH petrogenic distribution was categorized as "MC252 oil", since

determining the source is not definitive based on the PP PAH data alone. If only one or two petrogenic PAH analytes were detected (e.g., naphthalene alone, which is a common lab contaminant), then the sample was categorized as indeterminate source, as not enough information is present to make a source determination.

A pyrogenic PAH distribution was interpreted if the common pyrogenic PAHs were the primary components in the PP PAH distribution. The PP PAHs primarily of a characteristic pyrogenic source include fluotranthene, pyrene, benz(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benz(e)pyrene, benz(a)pyrene, indeno(1,2,3-c,d)pyrene, dibenz(a,h)anthracene and benz(g,h,i)perylene. As is common with pyrogenic PAH distributions, fluoranthene and pyrene were often the most abundant analytes in the overall distribution. Samples identified as pyrogenic PAH were classified as being from “not MC252 oil”. An example histogram of PAHs from a pyrogenic sediment sample is shown in Figure C-1.

Figure C-1. Histogram of PAHs from a pyrogenic sediment sample. The sample ID is T007-1331-100807-SD-1 collected on 7 August.



In some cases, additional hydrocarbon data, such as total petroleum hydrocarbon (TPH), gas range organics (GRO), diesel range organics (DRO), and oil range organics (ORO), were available in addition to the PP PAH. If available, the other hydrocarbon data was evaluated and used to confirm the presence of crude oil in the samples. For example, in one case the absence of crude ORO, but the presence of DRO hydrocarbons was used to categorize a sample with a petrogenic PP PAH designation as “not MC252 oil” since diesel was the primary hydrocarbon constituent.

C.3 Full-Alkyl PAH Samples

The initial evaluation of the alkyl PAH data followed a similar procedure, with the generation of PAH distribution plots for all of the target analytes. The samples were evaluated using the same process to interpret whether PAH distribution were petrogenic or pyrogenic. A pyrogenic PAH signature was determined using the same analyte and distribution criteria as described above for the PP PAH. Petrogenic PAH distributions were identified by the presence of a suite of alkyl PAHs. The characteristic petrogenic alkyl PAH distribution generally included alkyl naphthalenes, phenanthrenes and chrysenes, where the C-2 or C-3 alkyl groups were the most abundant in the distribution. Samples with chronic aquatic life ratio exceedances that had a petrogenic alkyl PAH distribution were categorized as “MC252 oil” if there was no other data available for review.

However, most samples with alkyl PAH data had additional hydrocarbon data including alkane and biomarker (steranes and triterpanes) concentrations, gas chromatography/mass spectrometry (GC/MS) biomarker extracted ion chromatogram profiles (extracted ion current profiles [EICPs]) and gas chromatography/flame ionization detection (GC/FID) chromatograms. In all cases for which additional data were available, the presence of MC252 oil was confirmed by comparisons of the biomarker and alkane distributions in the samples to those of the Q4000 (MC252) control oils analyzed along with each batch samples. A histogram of the PAHs in the Q4000 control oil is shown in Figure C-2. An example histogram is also shown for PAHs characteristic of MC252 oil found in a sediment sample near the wellhead (Figure C-3). If the biomarker and alkane comparisons were not characteristic of MC252 oil, then the sample exceedance was categorized as “not MC252 oil”.

Figure C-2. Histogram of PAHs in the Q4000 MC252 control oil.

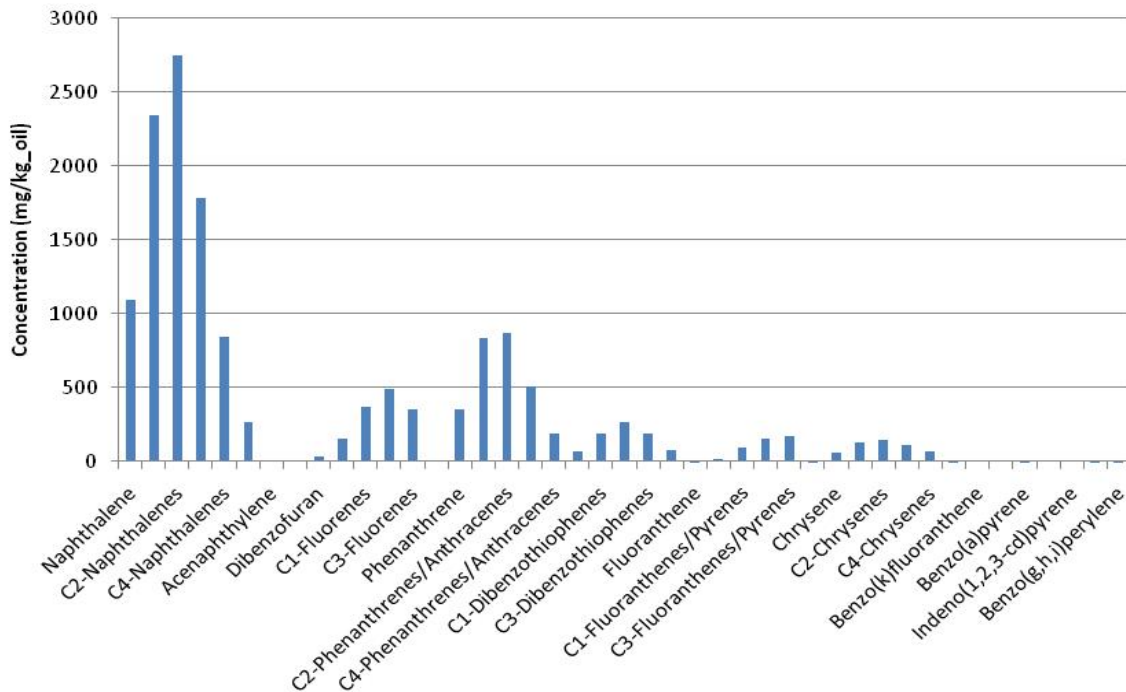
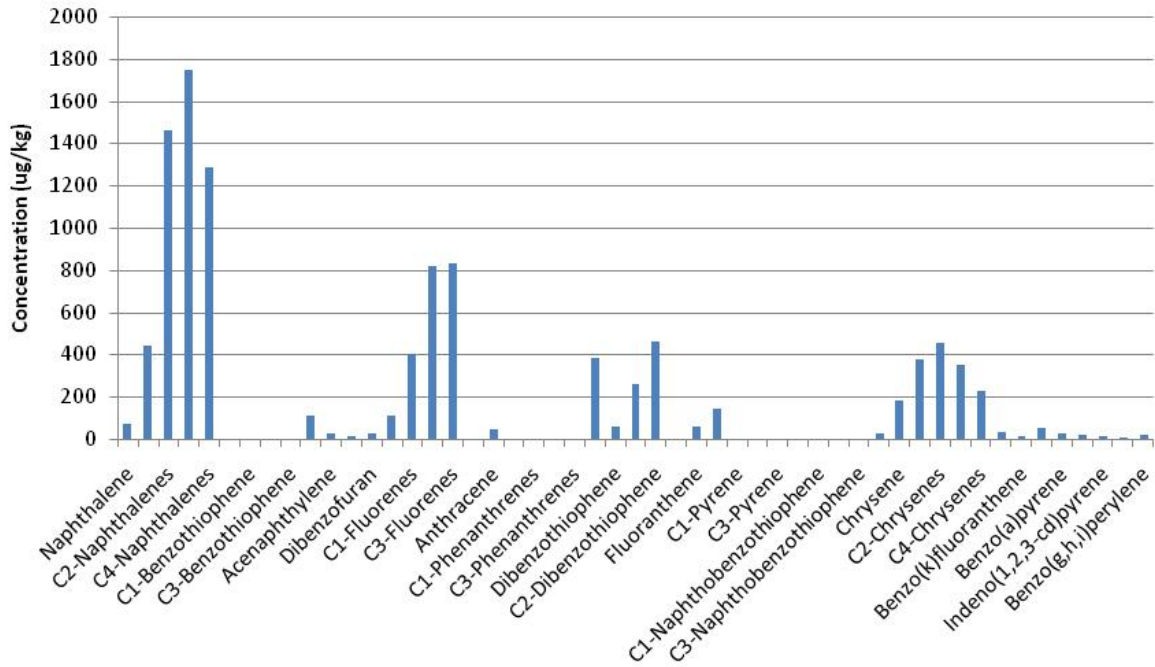


Fig. C-3. Histogram of PAHs in a sediment sample that was characteristic of MC252 oil within 3 km of the wellhead. The sample ID was SE-20101017-GY-D038SW-HC-053_BDO collected on 17 October by the R/V Gyre.



C.4 Sample Fingerprinting

Results of sample fingerprinting by USGS and Exponent are summarized in Tables C-1 and C-2, respectively. The identification of MC252 oil in the samples was based on interpretation of the compounds identified in the mass spectra of the sample extracts. Additionally, multivariate statistical analysis of the biomarker ratios was performed with the USGS samples utilizing hierarchical cluster analyses (HCA) and principal component analyses (PCA). As a blind comparison between the reviewers, seven samples were evaluated independently by each group, with both reviewers providing comparable assessments.

Table C-1. Results of sample evaluations performed by USGS on sediment and tarball samples collected from the Northern Gulf of Mexico Shoreline, Texas to Florida (Open-File Report 2010-1290).

Table 1. Gulf of Mexico Post-Oil Spill Sampling Sites

[Site: USGS designated number for site locality; Lab ID: Internal PCMSC reference number; * Likely mixture of oil with M-1 well oil, but cannot be conclusively verified by these analyses; ** NC indicates no sample obtained]

Site	Lab ID	Name	Latitude	Longitude	Sample date	mg/Kg dry	Sediment	Tarballs**
FL-1	10-131	DWH GOM Oil Spill-Gulf IS NS nr Navarre, FL	30.36239	-86.97017	10/4/10	5.1	mix*	no
FL-2	10-79	DWH GOM Oil Spill-Henderson Bch SP nr Destin, FL	30.38294	-86.44278	10/5/10	13.7	no	yes
FL-3	10-80	DWH GOM Oil Spill-Grayton Bch SP nr Seaside, FL	30.32406	-86.15506	10/5/10	10.3	yes	NC
FL-4	10-81	DWH GOM Oil Spill-St. Andrews SP nr Panama City, FL	30.12472	-85.73603	10/11/10	8.9	no	NC
FL-5	10-82	DWH GOM Oil Spill-St. Joe P-SP nr Port St. Joe, FL	29.77917	-85.40853	10/13/10	4.0	no	NC
FL-6	10-83	DWH GOM Oil Spill-St George IS SP nr E Point, FL	29.69786	-84.76775	10/6/10	4.3	no	NC
FL-7	10-84	DWH GOM Oil Spill-St. Marks NWR nr St. Marks, FL	30.07419	-84.18044	10/7/10	93	no	NC
FL-25	10-85	DWH GOM Oil Spill-BLM Lathrop Bayou nr Panama City, FL	30.04083	-85.43278	10/12/10	8.2	no	NC
AL-1	10-86	DWH GOM Oil Spill West Dauphin Island	30.22743	-88.32639	10/13/10	27.8	mix*	yes
AL-2	10-87	DWH GOM Oil Spill Dauphin Is. AL-2	30.24881	-88.18417	10/7/10	10.0	no	NC
AL-3	10-80	DWH GOM Oil Spill Dauphin Is. AL-3	30.24867	-88.07778	10/6/10	27.7	no	NC
AL-4	10-91	DWH GOM Oil Spill Fort Morgan AL-4	30.22493	-88.00833	10/12/10	73.4	yes	yes
AL-5	10-82	DWH GOM Oil Spill Fort Morgan AL-5	30.23046	-87.80444	10/13/10	60.9	yes	yes
AL-6	10-83	DWH GOM Oil Spill Gulf Shores AL-6	30.24131	-87.73026	10/14/10	40.3	mix*	yes
AL-7	10-84	DWH GOM Oil Spill Orange Beach AL-7	30.26909	-87.58165	10/14/10	14.7	mix*	yes
AL-8	10-95	DWH GOM Oil Spill BLM-1	30.23159	-87.93777	10/13/10	94.2	yes	yes
AL-9	10-96	DWH GOM Oil Spill BLM-2	30.22881	-87.86721	10/14/10	106	yes	yes
AL-10	10-97	DWH GOM Oil Spill Fort Morgan BLM-3	30.22826	-87.83110	10/14/10	44.5	mix*	yes
LA-0	10-88	DWH GOM Oil Spill, Bay Jimmy nr. Lafitte	29.45222	-90.87056	8/23/10	216	yes	NC
LA-22 12:30	10-89	DWH GOM Oil Spill-Jean Lafitte National Park, LA	29.74222	-90.14194	10/13/10	78.0	no	NC
LA-22 12:31	10-101	DWH GOM Oil Spill-Jean Lafitte National Park, LA	29.74222	-90.14194	10/13/10	25.6	no	NC
LA-23	10-102	DWH GOM Oil Spill-Cypremort Point, LA	29.73600	-91.85361	10/5/10	25.6	no	NC
LA-24	10-103	DWH GOM Oil Spill-Lake Felicity, LA	29.34611	-90.42917	10/12/10	13.9	no	NC
LA-25	10-104	DWH GOM Oil Spill-Rockefeller Refuge Beach, LA	29.63556	-92.76722	10/7/10	16.2	no	NC
LA-26	10-105	DWH GOM Oil Spill-Sister Lake, LA	29.25194	-90.92167	10/6/10	10.7	no	NC
LA-28	10-106	DWH GOM Oil Spill-Point Chevreuil, LA	29.57333	-91.53778	10/5/10	35.0	no	NC
LA-29	10-72	DWH GOM Oil Spill-Crooked Bayou, LA	29.72333	-89.72361	10/4/10	279	no	NC
LA-30	10-107	DWH GOM Oil Spill-Mississippi R. Gulf Outlet, LA	29.68556	-89.39583	10/4/10	33.5	no	NC
LA-31 11:00	10-68	DWH GOM Oil Spill-Grand Isle Bch at State Park, LA	29.26028	-89.95028	10/14/10	86.8	yes	yes
LA-31 11:02	10-70	DWH GOM Oil Spill-Grand Isle Bch at State Park, LA	29.26028	-89.95028	10/14/10	95.5	yes	yes
LA-32	10-108	DWH GOM Oil Spill-Mississippi R. at Main Pass, LA	29.32056	-89.18194	10/6/10	27.0	no	NC
LA-33	10-71	DWH GOM Oil Spill-Breton Sound, LA	29.58833	-89.61194	10/4/10	289	no	NC
LA-34	10-110	DWH GOM Oil Spill-Miss. Sound at Grand Pass, LA	30.15194	-89.24583	10/5/10	10.1	no	NC

Table C-1. (cont)

Site	Lab ID	Name	Latitude	Longitude	Sample date	mg/Kg dry	Sediment	Tarballs**
LA-35	10-130	DWH GOM Oil Spill-Mississippi R. at South Pass, LA	28.99750	-89.14889	10/13/10	6.0	no	NC
LA-36	10-112	DWH GOM Oil Spill-Mississippi R. at SW Pass, LA	28.93750	-89.39689	10/11/10	6.2	yes	NC
MS-37	10-113	DWH GOM OIL SPILL-South Cat Island Beach, MS	30.21917	-89.07972	10/14/10	7.0	yes	yes
MS-38	10-114	DWH GOM OIL SPILL-West Ship Island Beach, MS	30.20750	-88.97222	10/15/10	2.4	no	NC
MS-39	10-115	DWH GOM OIL SPILL-East Ship Island Beach, MS	30.23278	-88.89250	10/7/10	17.7	no	yes
MS-40	10-116	DWH GOM OIL SPILL-West Horn Island Beach, MS	30.24028	-88.73500	10/13/10	15.0	yes	yes
MS-41	10-117	DWH GOM OIL SPILL-East Horn Island Beach, MS	30.22250	-88.59250	10/13/10	4.6	no	yes
MS-42	10-76	DWH GOM OIL SPILL-Pett Bois Island Beach, MS	30.20222	-88.42667	10/12/10	651	yes	yes
MS-43	10-118	DWH GOM OIL SPILL-Pass Christian Beach, MS	30.31611	-89.23611	10/8/10	27.9	no	yes
MS-44	10-119	DWH GOM OIL SPILL-Biloxi Beach, MS	30.39333	-88.89944	10/7/10	5.3	no	no
MS-45	10-120	DWH GOM OIL SPILL-Pascagoula Beach, MS	30.34278	-88.54778	10/7/10	11.7	no	no
TX-46	10-123	East Sabine, LA Oil Spill Sample Site	29.74889	-93.66333	10/6/10	5.3	no	NC
TX-47	10-124	Texas Point, TX Oil Spill Sample Site	29.68250	-93.95639	10/6/10	17.3	no	NC
TX-49	10-125	High Island, TX Oil Spill Sample Site	29.55887	-94.38833	10/7/10	17.8	no	NC
TX-51 11:10	10-128	Galveston Island, TX Oil Spill Sample Site	29.30417	-94.78944	10/12/10	10.4	no	NC
TX-51 11:02	10-70	Galveston Island, TX Oil Spill Sample Site	29.30417	-94.78944	10/13/10	11.1	no	NC
TX-51 12:15	10-125	Galveston Island, TX Oil Spill Sample Site	29.30417	-94.78944	NA	4.0	no	NC
TX-53	10-132	Bolivar Peninsula Oil Spill Sample Site	29.38833	-94.71917	10/7/10	7.6	no	NC
TX-55	10-75	West Bay, Galveston Is SPk, Oil Spill Sample Site	29.21417	-94.95389	10/13/10	46.4	no	NC
TX-55 11:10	10-128	West Bay, Galveston Is SPk, Oil Spill Sample Site	29.21417	-94.95389	10/14/10	13.6	no	NC
TX-56	10-129	San Luis Pass, TX Oil Spill Sample Site	29.09667	-96.10861	10/5/10	1.2	no	NC

Table C-2. Results of sample evaluations performed by Exponent on nearshore sediment and water samples collected from the Northern Gulf of Mexico

Sample ID	Data Package	Total PAH	TPH	Biomarkers	DPnB	MC252 Oil Interpretation
BP						
MC252-EA070-REF01-01	10-0115	80 ng/L	23 ug/L	ND		Indeterminate trace level petrogenic PAH source
MC252-MC075-BAK02-10	10-0135	800 ng/L	63 ug/L	Few short list biomarker reported; but no hopane detected.	1600 ng/L	Probable dissolved phase MC252
MC252-MC296-BAK01-01	10-0135	1000 ng/L	37 ug/L	Few short list biomarker reported including hopane.	1300 ng/L	Probable dissolved phase MC252
MC252-MC296-BAK02-10	10-0135	0.378 ug/L	24.05 ug/L	ND	0.998 ug/L	Not MC252
MC252-MC299-BAK01-01	10-0158	0.278 ug/L	21.26 ug/L (DRO)	m/z 217 and 218 look similar to MC252 but interfering peak in m/z 218 and 231.	0.564 ug/L	Possible low MC252/ Mixture
MC252-MC379-BAK01-01	10-0125	1.577 ug/L	83.46 ug/L	m/z 217 and 218 look similar to MC252 but interfering peak in m/z 218 and 231.	3.626 ug/L	Possible MC252/Mixture
MC252-MP286-BAK01-01	10-0122	700 ng/L	180 ug/L	Few short list biomarker reported; but no hopane detected.	100 ng/L	Probable dissolved phase MC252
MC252-VK030-BAK01-1M	10-0069	1.379 ug/L	6.32 ug/L (SHC)	Biomarkers do not match MC252		Not MC252
MC252-VK817-BAK01-01	10-0115	0.727 ug/L	142.91 ug/L	Biomarkers do not match MC252		Not MC252
MC252-VK955-BAK01-1M	10-0066	4.604 ug/L	351.29 ug/L	Biomarkers show potential match	Concentration not reported but EICPs show DPnB doublet is present.	Possible MC252
MC252-WD106-REF01-1M		3.6 ug/L	170 ug/L	Biomarker similar to MC252	not reported	Indeterminate, possible MC252
SE-20100826-MVIP-SA137-63-01	10-0274	310.6 ug/Kg	19709.77 ng/g	Biomarkers do not match MC252	ND	Not MC252
SE-20100908-MVIP-WD079-33-01	10-0355	470.92 ug/kg	44624.93 ng/g	Biomarkers do not match MC252	ND	Not MC252
SE-20100909-MVIP-WD088-60-01	10-0355	428.69 ug/kg	31848.85 ng/g	Biomarkers do not match MC252	ND	Not MC252
SE-20100927-MVIP-BM04-11-01-DUP	10-0310	279.16 ug/Kg	40233.51 ng/g	Biomarkers do not match MC252	ND	Not MC252
SE-20100927-MVIP-ST027-17-01	10-0310	346.73 ug/Kg	42246.59 ng/g	Biomarkers do not match MC252	ND	Not MC252
SE-20101005-USGSLA2-LA-23-009	1215205	162 ug/Kg	6.9 mg/Kg	Biomarkers do not match MC252		Not MC252
SE-20101005-USGSLA2-LA-28-004	1215205	217 ug/Kg		Biomarkers do not match MC252		Not MC252
SE-20101006-USGSFL-FL-6-001	1215537	31 ug/Kg		ND		No crude present
SE-20101007-USGSLA1-LA-35-001	1215638	80 ug/Kg		ND		Not MC252
SE-20101007-USGSTX1-TX-53-005	1215659	21 ug/Kg		few trace level biomarker detected; do not match MC252		Not MC252

Table C-2. (cont)

Sample ID	Data Package	Total PAH	TPH	Biomarkers	DPnB	MC252 Oil Interpretation
BP						
SE-20101013-USGSMS-MS-42-002	1216555	20 ug/Kg		Biomarkers do not match MC252		Not MC252
SE-20101014-USGSAL1-AL-10-001	1216815	286 ug/Kg	24 mg/Kg	Biomarkers show potential match		Possible weathered MC252
SE-20101014-USGSAL1-AL-9-003	1216815	60 ug/Kg		Biomarkers show potential match		Possible weathered MC252
SE-20101014-USGSAL1-AL-9-004	1216815	116 ug/Kg		Biomarkers show potential match		Possible weathered MC252
SE-20101014-USGSLA2-LA-31-003	1216796	450 ug/Kg	32 ug/L	Biomarkers show potential match		Possible weathered MC252
SE-20101014-USGSTX2-TX-55-003	1216791	33 ug/Kg		few trace level biomarker detected; do not match MC252		Not MC252
SW-20100820-MVIP-WD042-31-06	10-0244	25 ng/L	3 ug/L (SHC)	No biomarkers detected.	15 ng/L	No crude present
SW-20100825-MVIP-GI029-16-06	10-0258	19 ng/L	28 ug/L (SHC)	Trace level biomarkers detected including hopane.	83 ng/L	Not MC252
SW-20100825-MVIP-WD053-31-04	10-0257	175 ng/L	3 ug/L (SHC)	No biomarkers detected.	25 ng/L	No crude present
SW-20101013-USGSLA2-LA-29-001	1216671	ND.	240 ug/L	ND		No crude present
EPA Region 4						
BCH02-SD-201008		83 ug/Kg				Indeterminate source of weathered petrogenic PAHs at low concentration (<100 ug/Kg)
D001-SD-20100619		30 ug/Kg				Not MC252
NCA10-1294-D-SD-09262010		10 ug/Kg				PAHs not consistent with MC252
NCA10-1303-D-SD-09242010		76 ug/Kg				PAHs not consistent with MC252
NCA10-1427-B-SD-09202010		62 ug/Kg				Indeterminate source of weathered petrogenic PAHs at low concentration (<100 ug/Kg)
NCA10-1429-B-SD-09202010		76 ug/Kg				Not MC252
NCA10-1431-D-SD-091610		591 ug/Kg				Not MC252
NCA10-1434-B-SD-09212010		116 ug/Kg				Not MC252
NCA10-1485-D-SD-09192010		147 ug/Kg				Not MC252
NCA10-1487-B-SD-09172010		80 ug/Kg				Not MC252
NCA10-2299-C-SD-09292010		2.8 ug/Kg				PAHs not consistent with MC252
PensBout-SD-20100825		658 ug/Kg				Not MC252
R4-69-C-SD-09282010		ND				Not MC252
SRSnd-SD-08252010		210 ug/Kg				Not MC252

Table C-2. (cont)

Sample ID	Data Package	Total PAH	TPH	Biomarkers	DPnB	MC252 Oil Interpretation
EPA Region 6						
T001-0042-100824-SD-1		154 ug/Kg				PAHs not consistent with MC252
T001-0062-100821-SD-1		189 ug/Kg				Not MC252 Oil
T001-1003-100809-SD-1		351 ug/Kg				PAHs not consistent with MC252 Oil
T001-1342-100904-SD-1		168 ug/Kg				Not MC252 Oil
T001-1347-100803-SD-1		632 ug/Kg				Possible MC252 Oil
T001-1403-100829-SD-1		395 ug/Kg				PAHs not consistent with MC252 Oil
T001-1405-100816-SD-1		188 ug/Kg				Not MC252 Oil
T001-1407-100902-SD-1		312 ug/Kg				PAHs not consistent with MC252 Oil
T001-1408-100831-SD-1		76 ug/Kg				Not MC252 Oil
T001-2001-100802-SD-1		1302 ug/Kg				PAHs not consistent with MC252
T001-2002-100805-SD-1		172 ug/Kg				PAHs not consistent with MC252 Oil
T001-2354-100813-SD-1		134 ug/Kg				Not MC252 Oil
T001-R657-100830-SD-1		164 ug/Kg				Not MC252 Oil
T001-R661-100829-SD-1		264 ug/Kg				Not MC252 Oil
T001-R673-100903-SD-1		397 ug/Kg				PAHs not consistent with MC252 Oil
T001-R674-100904-SD-1		204 ug/Kg				Not MC252 Oil
T002-0007-100505-SD-1		ND				Not MC252 Oil
T002-1331-100506-SD-1		179 ug/Kg				Not MC252 Oil
T003-2471-100507-SD-1		500 ug/Kg				Not MC252 Oil
T005-0034-100814-SD-1		341 ug/Kg				PAHs not consistent with MC252 Oil
T005-1310-100809-SD-1		229 ug/Kg				PAHs not consistent with MC252
T005-1320-100809-SD-1		330 ug/Kg				PAHs not consistent with MC252 Oil
T005-1336-100803-SD-1		568 ug/Kg				Possible MC252 Oil
T007-0006-100803-SW-1		ND				Not MC252 Oil
T007-1327-100807-SD-1		43 ug/Kg				Not MC252 Oil
T008-0019-100813-SD-1		66 ug/Kg				Not MC252 Oil
T008-0043-100826-SW-24-1		84 ug/Kg				Not MC252 Oil
T008-0052-100820-SD-1		ND				Not MC252 Oil
T008-0056-100822-SD-1		1138 ug/Kg				Possible MC252 Oil
T008-R621-100910-SD-1		230 ug/Kg				Not MC252 Oil
T008-R636-100829-SD-1		10 ug/Kg				Not MC252 Oil

Table C-2. (cont)

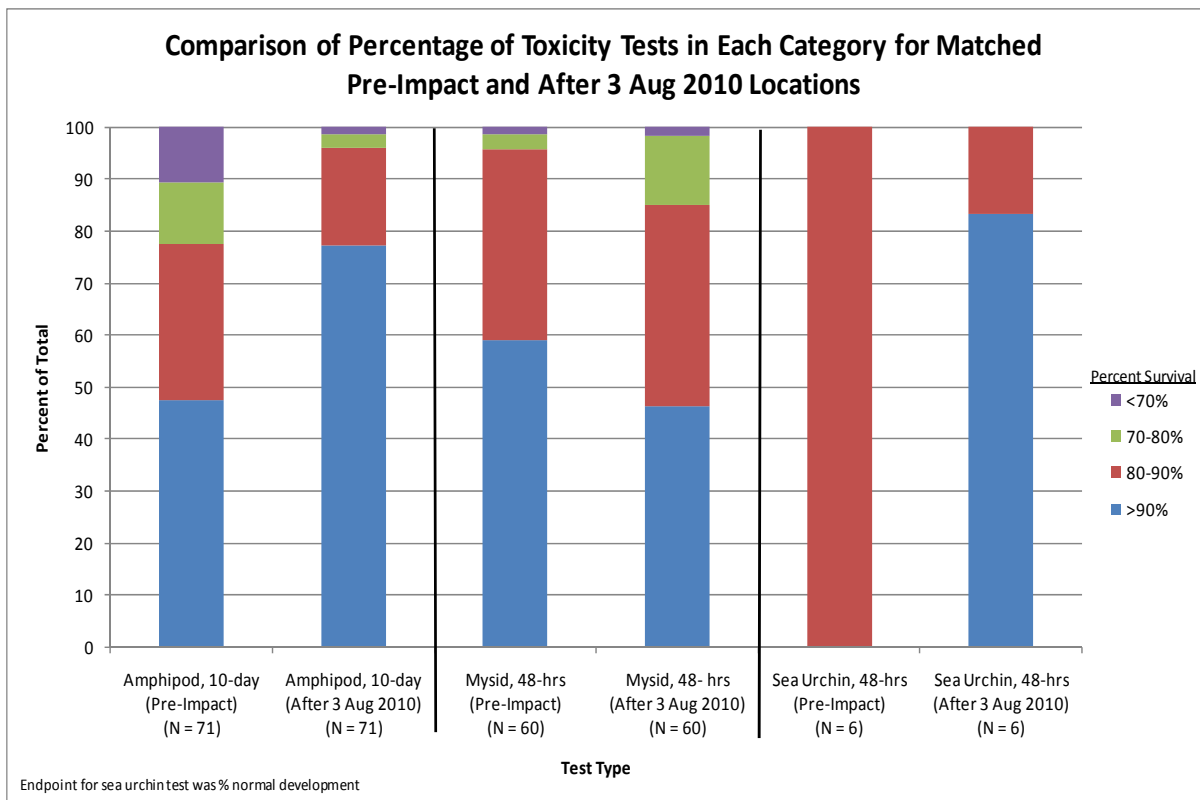
Sample ID	Data		TPH	Biomarkers	DPnB	MC252 Oil Interpretation
	Package	Total PAH				
USGS						
285615089235600_1014 [Station LA-36, 10/14/10]				MC252 sterane and triterpane pattern		Likely MC252 oil
291507090551800_1008 [Station LA-26, 10/8/10]				No Biomarker Data		NA
291537089570100_1014 [Station LA-31, 10/14/10]				ROM markers in Triterpanes, differences in steranes		Likely MC252 oil
293518089364300_1014 [Station LA-33, 10/14/10]				ROM markers differences in Triterpanes and steranes		Not MC252 Oil
293808092460200_1007 [Station LA-25, 10/7/10]				ROM markers differences in Triterpanes and steranes		Not MC252 Oil
294324089432500_1013 [Station LA-29, 10/13/10]				Differences in Triterpanes and steranes		Not MC252 Oil
301358088533300_1011 [Station MS-39, 10/11/10]				Only trace biomarkers detected		Not MC252 Oil
ND = Not Detected						
NA = Not Applicable						

Appendix D: Toxicity Re-Evaluation of Pre-Impact Samples

Appendix D presents the toxicity test endpoints for locations sampled pre-impact and resampled after the well was capped (post 3 August 2010). Resampled locations were identified within the dataset by comparing the latitude and longitude of pre-impact samples. The sample identifiers were also reviewed for additional confirmation. Appendix D presents only the toxicity test endpoints that were measured on both sets of samples. Additional tests were conducted on many of the samples collected after 3 Aug 2010.

As summarized in Figure D-1, matched toxicity tests were conducted with the amphipod, mysid, and sea urchin. The majority of the primary test endpoints (percent survival, percent normal development of sea urchin) were greater than 80% survival.

Figure D-1. Comparison of Toxicity Test Results for Matched Pre-Impact and After 3 August 2010 Locations.



The sea urchin sediment test was repeatedly evaluated for fertilization and embryo development at six locations, encompassing eight pre-impact samples and six post 3 Aug 2010 samples (see Table D-1). Only one post sample was significant for fertilization. The 10-day amphipod test was repeatedly measured at 71 locations, with 76 pre-impact samples and 80 post 3 Aug 2010 samples. A greater number of pre-impact samples

were significant (24 of 76, 32%) than the post samples (14 of 80, 18%) with the amphipod. The mysid 48-hour test had relatively few samples that were significantly different from the control. There were 2 of 64 (3%) pre-impact samples with survival significantly lower than the control and 8 of 67 (12%) post 3 Aug 2010 samples significantly different from the control.

Table D-1. Toxicity Test Results for Matched Pre-Impact and After 3 August 2010 Locations

Location	exsampid	Date	Sediment Sea Urchin, 60 min		Sediment Sea Urchin, 48 hrs		Sediment Amphipod, 10 days		Sediment Mysid, 48 hrs	
			Fertilization		Embryo Development		Survival		Survival	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post
FL-25	300223085260800_0610	06/10/10	99.6		85					
	300223085260800_1012	10/12/10		98.4		93.8				
LA-22	294432090083100_0514	05/14/10	99.2		85.2					
	294432090083100_1013	10/13/10		98.8		94.6				
LA-23	294406091511300_0513a	05/13/10	99.2		87					
	294406091511300_0513b	05/13/10	99.4		85.2					
	294406091511300_0513c	05/13/10	99.6		86.4					
	294406091511300_1005	10/05/10		97.8		94.2				
LA-24	292046090254500_0518	05/18/10	99.4		86.2					
	292046090254500_1012	10/12/10		84		88.4				
LA-28	293424091321600_0513	05/13/10	99.6		85.2					
	293424091321600_1005	10/05/10		97		93.8				
LA-29	294324089432500_0518	05/18/10	95.2		85.6					
	294324089432500_1013	10/13/10		16.4		91.2				
0001	T001-0001-100505-SD-1	05/05/10					95		96	
	T001-0001-100806-SD-1	08/06/10						91		88
0002	T001-0002-100505-SD-1	05/05/10					98		100	
	T001-0002-100806-SD-1	08/06/10						92		76
0003	T001-0003-100506-SD-1	05/06/10					98		96	
	T007-0003-100804-SD-1	08/04/10						90		
0004	T001-0004-100506-SD-1	05/06/10					100		96	
	T007-0004-100808-SD-1	08/08/10						100		90
0005	T001-0005-100506-SD-1	05/06/10					100		98	
	T007-0005-100808-SD-1	08/08/10						99		90
0006	T001-0006-100506-SD-1	05/06/10					99		96	
	T007-0006-100803-SD-1	08/03/10						73		
0007	T002-0007-100505-SD-1	05/05/10					35		82	
	T007-0007-100807-SD-1	08/07/10						99		80
0008	T002-0008-100506-SD-1	05/06/10					60		98	
	T007-0008-100806-SD-1	08/06/10						96		78
0009	T003-0009-100508-SD-1	05/08/10					98		100	
	T007-0009-100806-SD-1	08/06/10						98		94
0010	T003-0010-100510-SD-1	05/10/10					70		100	
	T005-0010-100805-SD-1	08/05/10						96		84
0011	T003-0011-100510-SD-1	05/10/10					94		90	
	T005-0011-100806-SD-1	08/06/10						85		94
0012	T003-0012-100509-SD-1	05/09/10					84		96	
	T005-0012-100806-SD-1	08/06/10						93		86
0013	T003-0013-100509-SD-1	05/09/10					95		98	
	T005-0013-100806-SD-1	08/06/10						86		96
0014	T003-0014-100509-SD-1	05/09/10					97		98	
	T005-0014-100807-SD-1	08/07/10						97		90
0015	T003-0015-100509-SD-1	05/09/10					97		90	
	T005-0015-100807-SD-1	08/07/10						99		92
0016	T003-0016-100514-SD-1	05/14/10					80		50	
	T005-0016-100810-SD-1	08/10/10						93		94
	T005-0016-100810-SD-2	08/10/10						82		96
0017	T003-0017-100514-SD-1	05/14/10					93		100	
	T005-0017-100810-SD-1	08/10/10						85		86

Table D-1. Toxicity Test Results for Matched Pre-Impact and After 3 August 2010 Locations

Location	exsampleid	Date	Sediment Sea Urchin, 60 min		Sediment Sea Urchin, 48 hrs		Sediment Amphipod, 10 days		Sediment Mysid, 48 hrs	
			Fertilization		Embryo Development		Survival		Survival	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post
0019	T003-0019-100516-SD-1	05/16/10					89		100	
	T008-0019-100813-SD-1	08/13/10						93		88
	T008-0019-100813-SD-2	08/13/10						91		92
0020	T008-0020-100604-SD-1	06/04/10					88		84	
	T008-0020-100810-SD-1	08/10/10						80		86
0021	T008-0021-100604-SD-1	06/04/10					90		96	
	T008-0021-100604-SD-2	06/04/10					90		98	
	T008-0021-100810-SD-1	08/10/10						99		84
0022	T008-0022-100606-SD-1	06/06/10					93		80	
	T008-0022-100815-SD-1	08/15/10						93		92
0023	T008-0023-100606-SD-1	06/06/10					93		78	
	T008-0023-100814-SD-1	08/14/10						91		98
0024	T008-0024-100606-SD-1	06/06/10					91		92	
	T008-0024-100814-SD-1	08/14/10						89		82
0025	T008-0025-100606-SD-1	06/06/10					40		82	
	T008-0025-100814-SD-1	08/14/10						93		86
0026	T008-0026-100606-SD-1	06/06/10					76		86	
	T008-0026-100814-SD-1	08/14/10						83		94
0027	T008-0027-100606-SD-1	06/06/10					70		86	
	T008-0027-100814-SD-1	08/14/10						93		94
0028	T008-0028-100606-SD-1	06/06/10					86		86	
	T008-0028-100812-SD-1	08/12/10						41		94
0029	T008-0029-100607-SD-1	06/07/10					95		90	
	T008-0029-100812-SD-1	08/12/10						82		92
0030	T008-0030-100607-SD-1	06/07/10					70		92	
	T008-0030-100812-SD-1	08/12/10						98		94
0031	T005-0031-100815-SD-1	08/15/10						87		84
	T008-0031-100607-SD-1	06/07/10					73		84	
0032	T005-0032-100815-SD-1	08/15/10						93		92
	T005-0032-100815-SD-2	08/15/10						93		88
	T008-0032-100607-SD-1	06/07/10					79		82	
0033	T005-0033-100815-SD-1	08/15/10						89		94
	T008-0033-100608-SD-1	06/08/10					88		94	
0034	T005-0034-100814-SD-1	08/14/10						94		100
	T008-0034-100608-SD-1	06/08/10					95		84	
	T008-0034-100608-SD-2	06/08/10					90		90	
0035	T005-0035-100814-SD-1	08/14/10						98		94
	T008-0035-100608-SD-1	06/08/10					99		90	
0036	T005-0036-100813-SD-1	08/13/10						95		92
	T008-0036-100610-SD-1	06/10/10					96		94	
0037	T005-0037-100813-SD-1	08/13/10						95		94
	T008-0037-100610-SD-1	06/10/10					76		98	
0039	T005-0039-100813-SD-1	08/13/10						95		90
	T008-0039-100610-SD-1	06/10/10					91		92	
0040	T005-0040-100813-SD-1	08/13/10						91		88
	T008-0040-100609-SD-1	06/09/10					87		90	
0041	T008-0041-100609-SD-1	06/09/10					91		90	
	T008-0041-100811-SD-1	08/11/10						99		96

Table D-1. Toxicity Test Results for Matched Pre-Impact and After 3 August 2010 Locations

Location	exsampid	Date	Sediment Sea Urchin, 60 min		Sediment Sea Urchin, 48 hrs		Sediment Amphipod, 10 days		Sediment Mysid, 48 hrs	
			Fertilization		Embryo Development		Survival		Survival	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post
1307	T003-1307-100516-SD-1	05/16/10					91		98	
	T008-1307-100813-SD-1	08/13/10						95		92
1310	T003-1310-100514-SD-1	05/14/10					94		100	
	T005-1310-100809-SD-1	08/09/10						86		94
1317	T003-1317-100514-SD-1	05/14/10					88		96	
	T005-1317-100809-SD-1	08/09/10						98		92
1320	T003-1320-100514-SD-1	05/14/10					90		96	
	T005-1320-100809-SD-1	08/09/10						89		96
1327	T002-1327-100505-SD-1	05/05/10					57		90	
	T007-1327-100807-SD-1	08/07/10						96		66
1328	T002-1328-100506-SD-1	05/06/10					72		90	
	T003-1328-100513-SD-1	05/13/10					90		88	
	T007-1328-100802-SD-1	08/02/10						95		
1331	T002-1331-100506-SD-1	05/06/10					67		100	
	T007-1331-100807-SD-1	08/07/10						96		78
	T007-1331-100807-SD-2	08/07/10						100		84
1332	T002-1332-100506-SD-1	05/06/10					75		96	
	T003-1332-100513-SD-1	05/13/10					75		98	
	T007-1332-100806-SD-1	08/06/10						97		84
	T008-1332-100818-SD-1	08/18/10						90		88
1333	T003-1333-100510-SD-1	05/10/10					85		100	
	T005-1333-100804-SD-1	08/04/10						94		
1336	T003-1336-100508-SD-1	05/08/10					94		94	
	T005-1336-100803-SD-1	08/03/10						97		
	T005-1336-100803-SD-2	08/03/10						92		
1459	T001-1459-100810-SD-1	08/10/10						96		86
	T003-1459-100506-SD-1	05/06/10					100		90	
1480	T008-1480-100609-SD-1	06/09/10					88		90	
	T008-1480-100811-SD-1	08/11/10						94		94
2312	T003-2312-100512-SD-1	05/12/10					86		86	
	T005-2312-100808-SD-1	08/08/10						100		92
2317	T003-2317-100514-SD-1	05/14/10					94		98	
	T005-2317-100810-SD-1	08/10/10						91		94
2318	T003-2318-100512-SD-1	05/12/10					94		92	
	T005-2318-100807-SD-1	08/07/10						90		84
2322	T003-2322-100512-SD-1	05/12/10					89		100	
	T003-2322-100512-SD-2	05/12/10					73		100	
	T005-2322-100808-SD-1	08/08/10						98		86
2327	T003-2327-100511-SD-1	05/11/10					83		98	
	T005-2327-100802-SD-1	08/02/10						87		
2331	T003-2331-100511-SD-1	05/11/10					89		96	
	T007-2331-100805-SD-1	08/05/10						100		78
2333	T003-2333-100508-SD-1	05/08/10					92		98	
	T007-2333-100805-SD-1	08/05/10						100		78
2337	T003-2337-100511-SD-1	05/11/10					81		98	
	T007-2337-100805-SD-1	08/05/10						97		80
2338	T003-2338-100511-SD-1	05/11/10					81		94	
	T005-2338-100811-SD-1	08/11/10						95		96

Table D-1. Toxicity Test Results for Matched Pre-Impact and After 3 August 2010 Locations

Location	exsampleid	Date	Sediment		Sediment		Sediment		Sediment	
			Sea Urchin, 60 min		Sea Urchin, 48 hrs		Amphipod, 10 days		Mysid, 48 hrs	
			Fertilization		Embryo Development		Survival		Survival	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post
2339	T003-2339-100510-SD-1	05/10/10					87		86	
	T005-2339-100805-SD-1	08/05/10						91		84
2346	T001-2346-100814-SD-1	08/14/10						95		88
	T001-2346-100814-SD-2	08/14/10						91		80
	T003-2346-100506-SD-1	05/06/10					100		86	
2358	T001-2358-100815-SD-1	08/15/10						97		96
	T001-2358-100815-SD-2	08/15/10						94		80
	T003-2358-100507-SD-1	05/07/10					91		90	
2365	T001-2365-100815-SD-1	08/15/10						98		88
	T003-2365-100506-SD-1	05/06/10					100		90	
2471	T001-2471-100815-SD-1	08/15/10						97		90
	T003-2471-100507-SD-1	05/07/10					88		94	
2475	T001-2475-100810-SD-1	08/10/10						98		92
	T003-2475-100507-SD-1	05/07/10					99		98	
BCH02	BCH02-SD-20100502	05/02/10					98			
	BCH02-SD-201008	08/20/10						95		
BCH04	BCH04-SD-20100503	05/03/10					98			
	BCH04-SD-201008	08/17/10						100		
MSSnd	MSSnd-SD-20100503	05/03/10					90			
	MSSnd-SD-20100909	09/09/10						92.5		
PerdBOut	PerdBOut-SD-20100505	05/05/10					99			
	PrdBout-SD-20100826	08/26/10						97.5		
SRSnd	SRSnd-SD-08252010	08/25/10						100		
	SRSnd-SD-20100505	05/05/10					99			

Appendix E: List of Acronyms

BOEMRE	Bureau of Ocean Energy Management, Regulation and Enforcement
CDC	Centers for Disease Control and Prevention
DRO	Diesel Range Organics
DOSS	Diocylsulfosuccinate Sodium Salt (a dispersant-related chemical)
DPnB	Di(Propylene Glycol) n-Butyl Ether (a dispersant-related chemical)
DWH	Deepwater Horizon
EPA	Environmental Protection Agency
EICP	Extracted Ion Current Profile
FOSC	Federal On-Scene Coordinator
GC/FID	Gas Chromatography/Flame Ionization Detection
GC/MS	Gas Chromatography/Mass Spectrometry
GRO	Gas Range Organics
GRI	Gulf Research Institute
HCA	Heirarchal Cluster Analysis
MMS	Minerals Management Service
NCA	EPA's National Coastal Assessment Survey
NCCR	EPA's National Coastal Condition Report
NIC	National Incident Command
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resources Damage Assessment
ORO	Oil Range Organics
OSAT	Operational Science Advisory Team
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCA	Principal Component Analyses
PP	Priority Pollutant
SMART	Specialized Monitoring of Applied Response Technologies
TPH	Total Petroleum Hydrocarbon
TOC	Total Organic Carbon
UAC	Unified Area Command

USCG

United States Coast Guard

USGS

United States Geological Survey

Appendix F: OSAT Membership

The Operational Science Advisory Team (OSAT) is a small group of agency representatives, or members, located at Deepwater Horizon Unified Area Command (UAC), within the Environmental Unit. The UAC operates under the direction of the Coast Guard's Federal On-Scene Coordinator (FOSC). The Environmental Unit is under the operational control of the National Oceanic and Atmospheric Administration (NOAA). OSAT acts as an advisory board, providing a cross-agency perspective based on near real-time analysis of data from the sub-surface and sub-sea monitoring effort to inform operational decision making.

Composition: Six scientific specialties were identified to coordinate daily analysis of data, trends and other considerations, based on the framework established by the Subsurface Monitoring Implementation Plan. Specialties were further matched to agencies to provide the expertise needed to quickly and efficiently process the data.

Oceanography – NOAA (Lead)

General Environmental Science – U.S. Coast Guard (USCG)

Coastal Science and Oil/Contaminant Chemistry – BP

Sedimentary Geology – U.S. Geologic Survey (USGS)

Microbiology – BOEMRE

Chemistry/Toxicology – U.S. Environmental Protection Agency (EPA)

OSAT is also supported by staff from the U.S. Coast Guard (administrative support and coordination) and a data management specialist working under the auspices of NOAA.

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