Slave River Water Quality Data (Hydrocarbons and Suspended Sediment): July, August and September 2020 compared to Historical Data (cont.)

Parameter	Centrifugate Water (ng/L)					Suspended Sediment (ng/g)				
	2010-2019		Jul-20	Aug-20	Sep-20	2010-2019		Jul-20	Aug-20	Sep-20
	Minimum	Maximum				Minimum	Maximum			
Dibenz(a,h)anthracene	0.039	1	2.78	0.086	0.085	3.87	10.3	8.77	3.74	5.02
Dibenzothiophene	0.04	2.37	2.71	0.123	0.135	6	20	14.5	6.98	8.42
Fluoranthene	0.149	2.2	6.1	0.227	0.327	8.91	26	22.7	10.7	13.6
Fluorene	0.098	4.56	2.98	0.062	0.188	5	28	18.1	6.24	8.48
Indeno(1,2,3-c,d)pyrene	0.036	1.22	3.95	0.129	0.162	6.19	15.9	14.8	7.07	9.59
Naphthalene	1.37	23.5	7.41	2.12	1.83	12	178	53	50.9	50.4
Perylene	0.035	15.8	53.5	1.47	2.08	133	253	222	146	211
Phenanthrene	0.445	20.5	21.6	0.753	1.06	37	187	125	65.1	79.3
Pyrene	0.134	3.7	10.9	0.401	0.555	15.7	42.9	38	18.1	24.1
Retene	0.07	6.98	25.8	0.769	0.971	49	186	107	128	114

Table 2: Hay River Water Quality Data (Hydrocarbons and Suspended Sediment): July 2020 compared to Historical Data

Parameter	Centrifugate Water (ng/L)			Suspended Sediment (ng/g)		
	2010-2019		Jul-20	2010-2019		July 2020
	Minimum	Maximum		Minimum	Maximum	
1,2,6-Trimethylphenanthrene	0.021	0.564	0.109	1.02	3.23	1.57
1,2-Dimethylnaphthalene	0.232	0.34	0.255	1.91	4.24	3.18
1,4,6,7-Tetramethylnaphthalene	0.088	0.26	0.188	2.45	5.13	4.34
1,7-Dimethylphenanthrene	0.029	0.675	0.11	2.82	9.25	4
1,8-Dimethylphenanthrene	0.026	0.038	0.064	0.949	1.87	1.52
1-Methylchrysene	0.019	0.099	0.237	3.7	7.42	6.97
1-Methylnaphthalene	0.798	47	2.7	5.08	11	7.45
1-Methylphenanthrene	0.104	0.573	0.351	4.02	9.11	6.87
2,3,5-Trimethylnaphthalene	0.222	0.95	0.598	5.87	10.9	8.44
2,3,6-Trimethylnaphthalene	0.259	1.16	0.656	5.76	12.5	9.89
2,4-Dimethyldibenzothiophene	0.029	0.506	0.191	1.31	2.3	2
2,6-Dimethylnaphthalene	0.413	1.3	0.713	3.58	263	4.49
2,6-Dimethylphenanthrene	0.033	0.234	0.064	1.2	3.21	1.62
2/3-Methyldibenzothiophenes	0.036	0.308	0.157	1.34	3.53	1.57
2-Methyl naphthalene	1.27	98	4.61	3.39	10	4.09

Table 2: Hay River Water Quality Data (Hydrocarbons and Suspended Sediment): July 2020 compared to Historical Data (cont.)

Parameter	Centrifugate Water (ng/L)			Suspended Sediment (ng/g)		
	2010-2019		Jul-20	2010-2019		July 2020
	Minimum	Maximum		Minimum	Maximum	
2-Methylfluorene	0.07	0.136	0.186	0.827	2.62	1
2-Methylphenanthrene	0.136	0.643	0.194	3.91	9.15	5.42
3,6-Dimethylphenanthrene	0.03	0.607	0.116	2.03	2.97	2.52
3-Methylfluoranthene/Benzo(a)fluorine	0.11	0.995	0.536	11	29	14.7
3-Methylphenanthrene	0.123	0.506	0.216	3.13	6.47	4.26
5,9-Dimethylchrysene	0.049	0.109	0.158	3.1	6.95	6.1
5/6-Methylchrysene	0.047	0.069	0.078	1.45	3.09	2.59
9/4-Methylphenanthrene	0.087	0.456	0.378	5.57	10.8	10
Acenaphthene	0.104	2	0.327	1.42	10	3.73
Acenaphthylene	0.084	0.44	0.417	0.051	10	0.225
Anthracene	0.033	0.068	0.089	0.232	10	0.518
Benz(a)anthracene	0.036	0.083	0.129	1.43	10	2
Benzo(a)pyrene	0.039	0.11	0.096	2.5	50	5.11
Benzo(b)fluoranthene	0.07	0.265	0.47	15	17	11.1
Benzo(e)pyrene	0.1	0.333	0.65	10	17	13.5

Table 2: Hay River Water Quality Data (Hydrocarbons and Suspended Sediment): July 2020 compared to Historical Data (cont.)

Parameter	Centrifugate Water (ng/L)			Suspended Sediment (ng/g)		
	2010-2019		Jul-20	2010-2019		July 2020
	Minimum	Maximum		Minimum	Maximum	
Benzo(g,h,i)perylene	0.098	3	0.532	13.1	21.5	17.3
Benzo(j,k)fluoranthene	0.023	0.172	0.114	2.05	5.11	3.37
Biphenyl	0.424	4	0.717	1	10	1.01
C1-Acenaphthenes	0.037	4	0.152	0.383	40	1.02
C1-Benz(a)Anthracenes/Chrysenes	0.05	0.572	1	19	40	32
C1-Benzofluoranthenes/Benzopyrenes	0.158	3.24	1.56	38	74.7	60.3
C1-Biphenyls	0.48	6.87	0.992	1.68	40	1.69
C1-Dibenzothiophenes	0.077	0.387	0.191	4.97	61	6.76
C1-Fluoranthenes/Pyrenes	0.301	2.58	1.56	29	87.2	39.8
C1-Fluorenes	0.26	4.09	0.318	5.41	40	5.85
C1-Naphthalenes	2.07	14.3	7.31	8.81	17.4	11.5
C1-Phenanthrenes/Anthracenes	0.191	12	1.14	17.5	147	26.2
C2-Benz(a)Anthracenes/Chrysenes	0.111	0.929	0.693	19.7	46.4	31.7
C2-Benzofluoranthenes/Benzopyrenes	0.094	4.53	0.159	11	40	15.7
C2-Biphenyls	0.634	39	3.65	2.27	42	3.57

Table 2: Hay River Water Quality Data (Hydrocarbons and Suspended Sediment): July 2020 compared to Historical Data (cont.)

Parameter	Centrifugate Water (ng/L)			Suspended Sediment (ng/g)		
	2010-2019		Jul-20	2010-2019		July 2020
	Minimum	Maximum		Minimum	Maximum	
C2-Dibenzothiophenes	0.211	1.84	0.893	15	202	21.1
C2-Fluoranthenes/Pyrenes	0.315	2.98	1.84	37.5	135	44
C2-Fluorenes	0.275	4.09	0.911	10.3	57.3	19.3
C2-Naphthalenes	1.95	25	4.31	19.5	819	32.9
C2-Phenanthrenes/Anthracenes	0.3	13	0.865	21.7	135	29.2
C3-Benzanthracenes/Chrysenes	0.042	0.766	0.078	3.97	40	5.1
C3-Dibenzothiophenes	0.176	2.67	0.508	17.1	60	27.2
C3-Fluoranthenes/Pyrenes	0.195	1.35	0.456	0.029	107	24.5
C3-Fluorenes	0.347	13	0.887	12	271	30.4
C3-Naphthalenes	1.27	45	2.96	27.4	155	49.4
C3-Phenanthrenes/Anthracenes	0.141	1.52	0.866	12	791	32.5
C4-Benzanthracenes/Chrysenes	0.097	4.83	0.087	1.5	40	1.17
C4-Dibenzothiophenes	0.202	2.52	0.063	12	66	15.3
C4-Fluoranthenes/Pyrenes	0.117	1.18	0.128	9.24	41.9	15
C4-Naphthalenes	0.646	7	1.82	15.8	188	36.9

Table 2: Hay River Water Quality Data (Hydrocarbons and Suspended Sediment): July 2020 compared to Historical Data (cont.)

Parameter	Centrifugate Water (ng/L)			Suspended Sediment (ng/g)		
	2010-2019		Jul-20	2010-2019		July 2020
	Minimum	Maximum		Minimum	Maximum	
C4-Phenanthrenes/Anthracenes	0.395	6.58	6.58	62	387	315
Chrysene	0.118	1	0.595	5	17.7	12.1
Dibenz(a,h)anthracene	0.046	0.088	0.178	1.62	10	2.05
Dibenzothiophene	0.084	1	0.137	1.41	10	1.86
Fluoranthene	0.219	3	0.585	4.33	14	6.29
Fluorene	0.119	6	0.264	1.18	13	1.63
Indeno(1,2,3-c,d)pyrene	0.061	0.122	0.214	3	10	5.55
Naphthalene	1.68	382	8.79	1.9	50	1.97
Perylene	0.379	5.74	13.1	164	391	392
Phenanthrene	0.593	9	0.957	6.28	36	6.97
Pyrene	0.213	9	1.03	5	16	10.5
Retene	0.257	5	4.79	50.8	340	261

Figure 1: Toxicity Units Calculation for hydrocarbons in suspended sediment of the Slave River at Fort Smith (2010 - 2020). This is one method to assess the toxicity of hydrocarbons to bottom dwelling aquatic organisms. When ∑ESB-TUs exceed 1.0, toxicity to benthic organisms is predicted. The toxicity indicator of 1.0 was not exceeded in any sample.

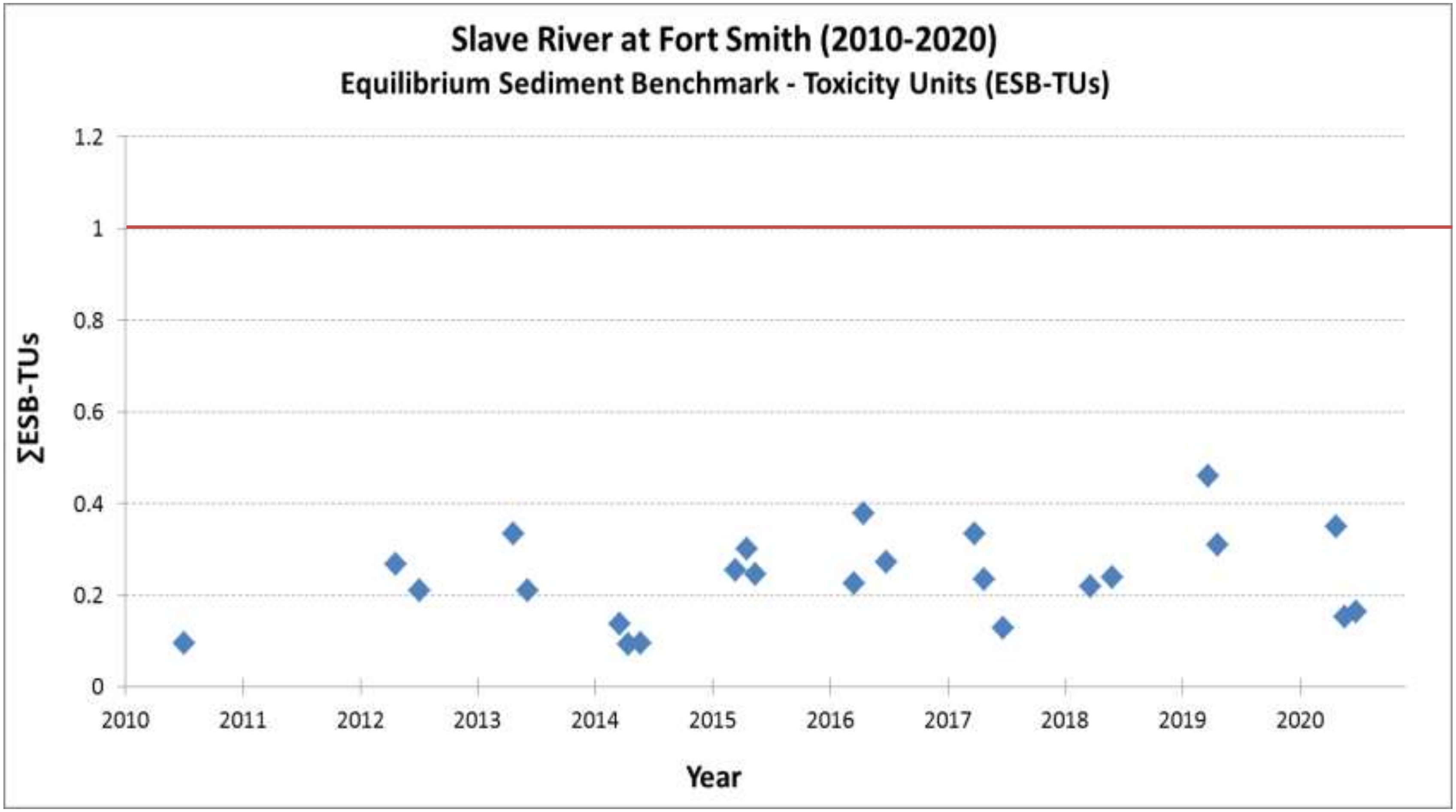

Figure 2: Toxicity Unit Calculation for hydrocarbons in suspended sediment of the Hay River (2011 - 2020). This is one method to assess the toxicity of hydrocarbons to bottom dwelling aquatic organisms. When ∑ESB-TUs exceed 1.0, toxicity to benthic invertebrates is predicted. The toxicity indicator of 1.0 was not exceeded in any sample.