

Sediment Quality Verification Dataset 2017 - North Saskatchewan River Summary

Note: Sediment samples collected from two settling chambers (Chamber#1 and Chamber#2). Sediment samples for Chamber#1 sent to ALS for Petroleum Hydrocarbon (PHC) and Polycyclic Aromatic Hydrocarbon (PAH) analysis. Sediment samples for Chamber#2 sent to ALS for PHC analysis and AXYS for PAH analysis. Chamber#1 and #2 located in the same tank, with Chamber#1 upstream of Chamber#2. The tank was a large metal bin receiving water directly from the North Saskatchewan River before any treatment. Tank was cleaned of all sediment between sampling events.

Sample Date	Sample Time	ALS Sample ID	AXYS Sample ID	Substance	Result	Unit (Dry Weight)	CCME ISQG Exceedance ¹	CCME PEL Exceedance ²
WSA Sediment Sampling								

North Battleford Intake Settling Chamber#1

05-Apr-17	11:00	L1909520-1	No Sample	Ethylbenzene	0.012	mg/kg	NS	NS
				m+p-Xylene	0.063	mg/kg	NS	NS

26-Apr-17	12:00	L1917833-1		Anthracene	0.0046	mg/kg	0.0469	0.245
				Benz(a)anthracene	0.011	mg/kg	0.0317	0.385
				Benzo(a)pyrene	0.023	mg/kg	0.0319	0.782
				Benzo(b&j)fluoranthene	0.019	mg/kg	NS	NS
				Benzo(e)pyrene	0.018	mg/kg	NS	NS
				Benzo(g,h,i)perylene	0.025	mg/kg	NS	NS
				Chrysene	0.015	mg/kg	0.0571	0.862
				Fluoranthene	0.021	mg/kg	0.111	2.355
				Indeno(1,2,3-cd)pyrene	0.015	mg/kg	NS	NS
				Perylene	0.019	mg/kg	NS	NS
				Phenanthrene	0.021	mg/kg	0.0419	0.515
				Pyrene	0.033	mg/kg	0.053	0.875
				Retene	0.012	mg/kg	NS	NS
		No Sample						

22-Jun-17	14:20	L1947372-1		Toluene	0.078	mg/kg	NS	NS
				1-Methylnaphthalene	0.019	mg/kg	NS	NS
				2-Methylnaphthalene	0.025	mg/kg	0.0202	0.201
				Chrysene	0.014	mg/kg	0.0571	0.862
				Naphthalene	0.011	mg/kg	0.0346	0.391
				Perylene	0.035	mg/kg	NS	NS
				Phenanthrene	0.025	mg/kg	0.0419	0.515
				Retene	0.03	mg/kg	NS	NS
		No Sample						

North Battleford Intake Settling Chamber#2

		L1909520-2		ND - PHC	--	--		
				1,2,6-Trimethylphenanthrene	2.3	ng/g	NS	NS
				1,2-Dimethylnaphthalene	4.77	ng/g	NS	NS
				1,4,6,7-Tetramethylnaphthalene	5.18	ng/g	NS	NS
				1,7-Dimethylfluorene	0.878	ng/g	NS	NS
				1,7-Dimethylphenanthrene	8.67	ng/g	NS	NS
				1,8-Dimethylphenanthrene	1.69	ng/g	NS	NS
				1-Methylchrysene	2.69	ng/g	NS	NS
				1-Methylnaphthalene	22.3	ng/g	NS	NS
				1-Methylphenanthrene	13.5	ng/g	NS	NS
				2,3,5-Trimethylnaphthalene	17.3	ng/g	NS	NS
				2,3,6-Trimethylnaphthalene	18.4	ng/g	NS	NS
				2,4-Dimethyldibenzothiophene	0.998	ng/g	NS	NS
				2,6-Dimethylnaphthalene	17.7	ng/g	NS	NS
				2,6-Dimethylphenanthrene	2.29	ng/g	NS	NS
				2/3-Methyldibenzothiophenes	2.55	ng/g	NS	NS
				2-Methylantracene	1.98	ng/g	NS	NS
				2-Methylfluorene	2.08	ng/g	NS	NS
				2-Methylnaphthalene	30.2	ng/g	20.2	201
				2-Methylphenanthrene	14.3	ng/g	NS	NS

05-Apr-17

11:10

L27140-1

3,6-Dimethylphenanthrene	2.56	ng/g	NS	NS
3-Methylfluoranthene/Benzo[a]fluorene	17.6	ng/g	NS	NS
3-Methylphenanthrene	8.94	ng/g	NS	NS
5,9-Dimethylchrysene	3.57	ng/g	NS	NS
5/6-Methylchrysene	1.89	ng/g	NS	NS
7-Methylbenzo[a]pyrene	1.57	ng/g	NS	NS
9/4-Methylphenanthrene	13.8	ng/g	NS	NS
Acenaphthene	0.619	ng/g	6.71	88.9
Anthracene	0.766	ng/g	46.9	245
Benz[a]anthracene	3.38	ng/g	31.7	385
Benzo[a]pyrene	3.64	ng/g	31.9	782
Benzo[b]fluoranthene	8.63	ng/g	NS	NS
Benzo[e]pyrene	7.95	ng/g	NS	NS
Benzo[ghi]perylene	5.08	ng/g	NS	NS
Benzo[j,k]fluoranthenes	2.92	ng/g	NS	NS
Biphenyl	6.71	ng/g	NS	NS
C1 Phenanthrenes/Anthracenes	52.6	ng/g	NS	NS
C1-Benzo[a]anthracenes/Chrysenes	17.8	ng/g	NS	NS
C1-Benzofluoranthenes/Benzopyrenes	18.8	ng/g	NS	NS
C1-Biphenyls	11.2	ng/g	NS	NS
C1-Dibenzothiophenes	5.63	ng/g	NS	NS
C1-Fluoranthenes/Pyrenes	50	ng/g	NS	NS
C1-Fluorenes	6.15	ng/g	NS	NS
C1-Naphthalenes	52.5	ng/g	NS	NS
C2 Phenanthrenes/Anthracenes	44.1	ng/g	NS	NS
C2-Benzo[a]anthracenes/Chrysenes	14.7	ng/g	NS	NS
C2-Benzofluoranthenes/Benzopyrenes	5.18	ng/g	NS	NS
C2-Biphenyls	9.93	ng/g	NS	NS
C2-Dibenzothiophenes	11.8	ng/g	NS	NS
C2-Fluoranthenes/Pyrenes	56.3	ng/g	NS	NS
C2-Fluorenes	15.7	ng/g	NS	NS

C2-Naphthalenes	94.5	ng/g	NS	NS
C3-Benzo[a]anthracenes/Chrysenes	2.34	ng/g	NS	NS
C3-Dibenzothiophenes	9.62	ng/g	NS	NS
C3-Fluoranthenes/Pyrenes	24	ng/g	NS	NS
C3-Fluorenes	18.4	ng/g	NS	NS
C3-Naphthalenes	82.7	ng/g	NS	NS
C3-Phenanthrenes/Anthracenes	29.3	ng/g	NS	NS
C4-Dibenzothiophenes	3.92	ng/g	NS	NS
C4-Fluoranthenes/Pyrenes	7.61	ng/g	NS	NS
C4-Naphthalenes	49	ng/g	NS	NS
C4-Phenanthrenes/Anthracenes	76.7	ng/g	NS	NS
Chrysene	10.9	ng/g	57.1	862
Dibenz[a,h]anthracene	0.994	ng/g	6.22	135
Dibenzothiophene	1.48	ng/g	NS	NS
Fluoranthene	5.14	ng/g	111	2355
Fluorene	1.14	ng/g	21.2	144
Indeno[1,2,3-cd]pyrene	3.03	ng/g	NS	NS
Naphthalene	14.3	ng/g	34.6	391
Perylene	49.9	ng/g	NS	NS
Phenanthrene	21.4	ng/g	41.9	515
Pyrene	11.4	ng/g	53	875
Retene	40.7	ng/g	NS	NS

L1917833-2		ND - PHC	--	--		
		1,2,6-Trimethylphenanthrene	2.91	ng/g	NS	NS
		1,2-Dimethylnaphthalene	6.33	ng/g	NS	NS
		1,4,6,7-Tetramethylnaphthalene	6.44	ng/g	NS	NS
		1,7-Dimethylfluorene	1.06	ng/g	NS	NS
		1,7-Dimethylphenanthrene	11.1	ng/g	NS	NS
		1,8-Dimethylphenanthrene	1.79	ng/g	NS	NS
		1-Methylchrysene	3.58	ng/g	NS	NS

C1-Benzofluoranthenes/Benzopyrenes	27.3	ng/g	NS	NS
C1-Biphenyls	13.8	ng/g	NS	NS
C1-Dibenzothiophenes	8.63	ng/g	NS	NS
C1-Fluoranthenes/Pyrenes	65.7	ng/g	NS	NS
C1-Fluorenes	8.37	ng/g	NS	NS
C1-Naphthalenes	68.9	ng/g	NS	NS
C2 Phenanthrenes/Anthracenes	52.6	ng/g	NS	NS
C2-Benzo[a]anthracenes/Chrysenes	15.2	ng/g	NS	NS
C2-Benzofluoranthenes/Benzopyrenes	8.57	ng/g	NS	NS
C2-Biphenyls	11	ng/g	NS	NS
C2-Dibenzothiophenes	12.3	ng/g	NS	NS
C2-Fluoranthenes/Pyrenes	67.5	ng/g	NS	NS
C2-Fluorenes	17.3	ng/g	NS	NS
C2-Naphthalenes	126	ng/g	NS	NS
C3-Benzo[a]anthracenes/Chrysenes	2.57	ng/g	NS	NS
C3-Dibenzothiophenes	11.4	ng/g	NS	NS
C3-Fluoranthenes/Pyrenes	25.3	ng/g	NS	NS
C3-Fluorenes	21.7	ng/g	NS	NS
C3-Naphthalenes	110	ng/g	NS	NS
C3-Phenanthrenes/Anthracenes	33.6	ng/g	NS	NS
C4-Dibenzothiophenes	5.42	ng/g	NS	NS
C4-Fluoranthenes/Pyrenes	8.11	ng/g	NS	NS
C4-Naphthalenes	59.6	ng/g	NS	NS
C4-Phenanthrenes/Anthracenes	106	ng/g	NS	NS
Chrysene	16.4	ng/g	NS	NS
Dibenz[a,h]anthracene	1.63	ng/g	31.7	385
Dibenzothiophene	1.98	ng/g	NS	NS
Fluoranthene	11.9	ng/g	111	2355
Fluorene	2.06	ng/g	21.2	144
Indeno[1,2,3-cd]pyrene	6.36	ng/g	NS	NS
Naphthalene	17.5	ng/g	34.6	391

				Perylene	57.8	ng/g	NS	NS
				Phenanthrene	31	ng/g	41.9	515
				Pyrene	18.4	ng/g	53	875
				Retene	55.9	ng/g	NS	NS
22-Jun-17	14:30	L1947372-2	Results Pending	Toluene	0.065	mg/kg	NS	NS

Notes:

- ND Not Detected
- Exceeds guideline - CCME Sediment Quality Guidelines for Protection of Aquatic Life
- NS No Standard
 - 1 Interim Sediment Quality Guidelines
 - 2 Probable Effect Level

Contaminant	Detection Limit (mg/kg)		CCME	
	ALS		ISQC	PEL
Benzene	0.005		NS	NS
Ethylbenzene	0.01		NS	NS
m+p-Xylene	0.05		NS	NS
o-Xylene	0.05		NS	NS
Total Xylene	0.1		NS	NS
Toluene	0.05		NS	NS
1-Methylnaphthalene	0.01		NS	NS
2-Methylnaphthalene	0.01		0.0202	0.201
Acenaphthene	0.005		0.00671	0.0889
Acenaphthylene	0.005		0.00587	0.128
Acridine	0.01		NS	NS
Anthracene	0.004		0.0469	0.245
Benzo(a)anthracene	0.01		0.0317	0.385
Benzo(a)pyrene	0.01		0.0319	0.782
Benzo(b)fluoranthene			NS	NS
Benzo(b+j)fluoranthene	0.01		NS	NS
Benzo(e)pyrene			NS	NS
Benzo(g,h,i)perylene	0.01		NS	NS

Benzo(k)fluoranthene	0.01	NS	NS
Chrysene	0.01	0.0571	0.862
Dibenzo(a,h)anthracene	0.005	0.00622	0.135
Fluoranthene	0.01	0.111	2.355
Fluorene	0.01	0.0212	0.144
Indeno(1,2,3,-c,d)pyrene	0.01	NS	NS
Naphthalene	0.01	0.0346	0.391
Perylene		NS	NS
Phenanthrene	0.01	0.0419	0.515
Pyrene	0.01	0.053	0.875
Quinoline	0.01	NS	NS
Styrene	0.05	NS	NS
Hydrocarbons, F1 (C6-C10)	10	NS	NS
Hydrocarbons, F1 (BTEX)	10	NS	NS
Hydrocarbons, F1		NS	NS
Hydrocarbons, F2	30	NS	NS
TEH (C11-C22)	50	NS	NS
Hydrocarbons, F3	50	NS	NS
TEH (C23-C60)	100	NS	NS
Hydrocarbons, F4 (C34-C50)	50	NS	NS
Hydrocarbons, F4 (C32-C50)		NS	NS
Total Hydrocarbons	50	NS	NS