Table U-14.

Bioavailability Analysis of Metals using

Excess Simultaneously Extracted Metal - Acid Volatile Sulfide Method (SEM-AVS)

Location ID: / Pond: / Depth Range (ft. bgs):		RISESP-14 RCF Pond 0 - 0.5	RISESP-15 RCF Pond 0 - 0.5	RISESP-16 RCF Pond 0 - 0.5	RISESP-17 RCF Pond 0 - 0.5	RISESP-18 RCF Pond 0 - 0.5	RISESP-19 A-Series Pond 0 - 0.5	RISESP-20 A-Series Pond 0 - 0.5	RISESP-21 A-Series Pond 0 - 0.5	RISESP-22 A-Series Pond 0 - 0.5	RISESP-23 Pond 13 0 - 0.5	Mean
	M.W. (g/mol)											
AVS (mg/kg dry weight)		2060	2170	3810	1110	905	6430	5870	5810	4010	4820	3798
SEM Metals (mg/kg dry weight)												
Cadmium	112	2.7	2.1	3.8	2.0	1.6	16	7.5	11	10	4.2	6.6
Copper	63.5	9.6	11	12	6.2	5.9	20	38	21	20	9.4	16
Lead	207	<15	<12	<17	8.0	<7	<37	<21	<26	<26	<26	<8.0
Nickel	58.7	31.7	27.5	42.8	27.3	23.6	93.8	79.2	101.0	86.0	68.3	61.1
Silver	108	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	65.4	55.4	54.0	54.0	42.0	36.7	72.8	112	84.8	67.9	43.0	63.4
AVS (µmol/g)[a]		64.2	67.7	118.8	34.6	28.2	200	183	181	125	150	118
SEM Metals (µmol/g)[a]												
Cadmium		0.0240	0.0187	0.0338	0.0178	0.0142	0.138	0.0667	0.101	0.0916	0.0374	0.0587
Copper		0.151	0.165	0.190	0.098	0.093	0.308	0.590	0.335	0.312	0.148	0.248
Lead		<0.07	<0.06	<0.08	0.04	<0.03	<0.18	<0.10	<0.13	<0.13	<0.13	<0.04
Nickel		0.540	0.469	0.729	0.465	0.402	1.60	1.35	1.72	1.47	1.16	1.04
Silver		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc		0.847	0.826	0.826	0.642	0.561	1.11	1.71	1.30	1.04	0.657	0.969
ΣSEM (µmol/g)		1.60	1.51	1.82	1.26	1.09	3.25	3.77	3.52	2.97	2.07	2.37
Excess SEM (ΣSEM-AVS) (µmol/g)[b]		-63	-66	-117	-33	-27	-197	-179	-178	-122	-148	-116
Organic Carbon Normalized Excess SEM[c]												
ΣSEM-AVS/f_{oc} (low) (µmol/g_{oc})		-31318	-33079	-58491	-16675	-13566	-98626	-89634	-88825	-61035	-74114	-58025
ΣSEM-AVS/f_{oc} (med) (µmol/g_{oc})		-4176	-4410	-7799	-2223	-1809	-13150	-11951	-11843	-8138	-9882	-7737
ΣSEM-AVS/f_{oc} (high) (µmol/g_{oc})		-1790	-1890	-3342	-953	-775	-5636	-5122	-5076	-3488	-4235	-3316
Organic Carbon Normalized Excess Capacity[d]												
Excess capacity (low) (µmol/g_{oc})		31,448	33,209	58,621	16,805	13,696	98,756	89,764	88,955	61,165	74,244	58,155
Excess capacity (med) (µmol/g_{oc})		4,306	4,540	7,929	2,353	1,939	13,280	12,081	11,973	8,268	10,012	7,867
Excess capacity (high) (µmol/g_{oc})		1,920	2,020	3,472	1,083	905	5,766	5,252	5,206	3,618	4,365	3,446

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Excess Simultaneously Extracted Metal - Acid Volatile Sulfide Method (SEM-AVS)

Notes:
< xx = not detected at the value reported.
AVS = Acid Volatile Sulfides
ΣSEM = Total SEM metals
SEM = Metals simultaneously extracted with AVS
ft bgs = feet below ground surface.
g/mol = grams per mole.
M.W.= Molecular weight
mg/kg = milligrams per kilogram.
NA = not analyzed
f_{oc} = fraction of organic carbon
µmol/g = micromoles per gram dry sediment
µmol/g_{oc} = micromoles per gram organic carbon

[a] Molar concentration (µmol/g) = dry weight concentration (mg/kg)/molecular weight (g/mol)

[b] Excess SEM calculated as ΣSEM minus AVS.

Toxicity Scenarios:

No observersed toxicity = ΣSEM -AVS < 0

Potential toxicity = ΣSEM-AVS > 0

[c] Excess SEM (ΣSEM-AVS) organic carbon normalized for three scenarios:

low = low organic carbon scenario (0.2%)

med = medium organic carbon scenario (1.5%)

high = high organic carbon scenario (3.5%)

Toxicity Scenarios:

No observed toxicity = (ΣSEM-AVS/f_{oc}) < 130 µmol/g_{oc}

Uncertain = 130 µmol/g_{oc} < (ΣSEM-AVS/f_{oc}) < 3000 µmol/g_{oc}

Potential toxicity = (ΣSEM-AVS/f_{oc}) > 3000 µmol/g_{oc}

[d] Excess Capacity = (ΣSEM-AVS/f_{oc}) + 130 µmol/g_{oc}