QC Table SQ1. Percent relative standard deviation from repeated analysis of Trace Metals in Drinking Water Standard[a] during a semi-quantitative sample run of SEMO sediment samples. Results expressed in ng/mL unless otherwise noted.

Ele.	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Actual Conc	Mean Conc	SD	% RSD
Li	20.3	20.0	20.7	20.4	21.8	20.1	20.5	20.	20.5	0.6	3.0
Be	20.2	20.3	21.7	20.9	21.8	20.5	21.2	20.	20.9	0.6	3.1
Na[b]	6.40	6.76	6.83	6.78	7.10	6.69	6.94	6.0	6.8	0.2	3.2
Mg[b]	9.49	9.84	10.0	9.88	10.3	9.78	10.2	9.0	9.9	0.3	2.7
Al	122.	123.	124.	120.	124.	118.	121.	120.	121.6	2.5	2.0
K[b]	3.21	3.32	3.37	3.30	3.42	3.26	3.38	2.5	3.3	0.1	2.2
Ca[b]	35.2	35.7	35.6	34.6	36.3	34.2	35.3	35.	35.3	0.7	2.0
V	29.9	30.2	30.3	29.4	30.1	29.2	29.6	30.	29.8	0.4	1.4
Cr	19.8	20.3	20.2	19.7	20.2	19.5	20.2	20.	20.0	0.3	1.5
Mn	39.6	40.9	40.6	40.1	40.7	38.6	40.0	40.	40.1	0.8	1.9
Fe	133.	138.	139.	136.	140.	134.	140.	100.	137.1	2.9	2.
Co	24.9	25.1	25.2	24.3	24.5	23.7	24.3	25.	24.6	0.5	2.2
Ni	59.2	59.0	58.6	57.2	57.0	56.0	57.0	60.	57.7	1.2	2.1
Cu	19.7	19.5	19.5	19.0	18.9	18.7	18.8	20.	19.1	0.4	2.1
Zn	70.4	71.0	70.6	68.9	70.6	68.0	70.6	70.	70.0	1.1	1.6
As	80.8	82.3	83.0	80.9	82.2	80.1	79.5	80.	81.3	1.3	1.6
Se	10.0	10.8	10.9	10.3	10.4	9.80	10.26	10.	10.3	0.4	3.8
Rb	10.1	10.5	10.5	10.2	10.4	10.0	9.64	10.	10.2	0.3	3.1
Sr	266.	286.	295.	291.	293.	286.	282.	250.	285.7	9.5	3.3
Mo	103.	105.	104.	104.	103.	99.5	99.1	100.	102.4	2.3	2.2
Ag	1.99	2.03	1.93	1.91	2.00	1.91	1.88	2.0	2.0	0.1	2.9
Cd	10.2	10.3	10.2	9.9	10.1	9.69	9.47	10.	10.0	0.3	3.1
Sb	10.2	10.3	10.3	10.1	10.1	10.0	9.60	10.	10.1	0.2	2.3
Te	3.08	3.19	3.10	3.06	3.05	2.90	2.90	3.0	3.0	0.1	3.5
Ba	51.3	51.3	53.5	51.1	51.6	49.6	48.8	50.	51.0	1.5	3.0
Pr	10.1	10.2	10.4	10.2	10.2	9.61	9.35	10.	10.0	0.4	3.8
Tb	10.1	10.2	10.3	10.2	10.4	9.66	9.27	10.	10.0	0.4	4.0
Tm	10.1	10.4	10.4	10.3	10.2	9.48	9.29	10.	10.0	0.5	4.5
Ta	9.81	9.42	8.80	8.13	7.56	7.97	7.12	10.	8.4	1.0	12.
Au	0.46	0.45	0.42	0.37	0.36	0.37	0.33	10.	0.4	0.0	12.
Tl	10.2	10.1	10.2	10.0	9.94	9.70	9.60	10.	10.0	0.2	2.4
Pb	40.8	40.2	41.2	40.9	40.4	39.0	37.6	40.	40.0	1.3	3.2
Bi	8.06	8.17	8.40	8.14	8.03	7.86	7.76	10.	8.1	0.2	2.6
U	9.89	10.03	10.0	9.89	9.80	9.38	9.32	10.	9.8	0.3	3.0

[a]High Purity Trace Metals in Drinking Water, Cat # CRM-TMDW, Charleston, SC.; Pr, Tb, Tm, Ta, and Au manually added to represent rare earth region of the mass spectral range.

[b]concentrations are ppm (µg/mL)

QC Table SQ2. Recovery of elements from control samples determined with semi-quantitative analysis of SEMO sediment samples.

a. SPEX ClaritasPPT[a]

Element	Actual Conc	Meas Conc	% Rec
Be	50.	58.	115.
Na	500.	567.	113.
Mg	500.	476.	95.
Al	50.	54.	108.
K	500.	661.	132.
Ca	500.	519.	104.
Ti	50.	51.	102.
V	50.	51.	102.
Cr	50.	52.	104.
Mn	50.	53.	106.
Fe	500.	531.	106.
Co	50.	53.	107.
Ni	50.	53.	106.
Cu	50.	56.	112.
Zn	50.	57.	115.
As	50.	53.	106.
Se	50.	57.	114.
Sr	50.	43.	85.
Mo	50.	48.	96.
Ag	50.	53.	105.
Cd	50.	52.	104.
Sn	50.	64.	127.
Sb	50.	51.	101.
Ba	50.	51.	103.
Tl	50.	54.	108.
Pb	50.	56.	112.

[a] a mixture of SPEX Claritas PPT Instrument Check Standards 1 (CL-ICS-1), 3 (CL-ICS-3, and 5 (CL-ICS-5); SPEX CertiPrep, Inc., Metuchen, NJ; units ng/mL.

b. SPEX Custom Multielement Standards[b]

Element	Actual Conc	Meas Conc	% Rec
Pr	10.	10.4	104.
Tb	10.	10.3	103.
Tm	10.	10.8	108.
Ta	10.	10.9	109.
Ir	10.	10.5	105.

[b] a mixture of SPEX Custom Multielement Standards XCERCMO-1 and XCERCMO-2; SPEX CertiPrep, Inc., Metuchen, NJ; units ng/mL.

QCTable SQ3. Percent change in internal standards during the ICP-MS semi-quantitative run of SEMO sediment samples.

BID	Run Date	IS	Conc (ppb)	Matrix	Initial Intensity	End Intensity	% Change
01/12/09	01/23/09	Sc	10.	sediment	124703	118356	5.4
01/12/09	01/23/09	Rh	10.	sediment	141586	131150	8.0
01/12/09	01/23/09	Th	10.	sediment	237351	243921	2.7

QC Table SQ4. Measured concentrations (µg/g dry wgt) of total recoverable elements in two sediment reference materials digested and analyzed by semi-quantitative ICP-MS.

NOTE: Actual concentrations were determined using a complete dissolution of all refractory mineral phases.

NIST 2710 Montana Soil[a]

Ele	Actual Conc	Meas. Conc	% Rec[c]
Na	11400 +/- 600	606.	5.6
Mg	8530 +/- 420	4350.	54.
Al	64400 +/- 800	25900.	41.
K	21100 +/- 1100	6740.	34.
Ca	12500 +/- 300	3490.	29.
Ti	2830 +/- 100	1130.	41.
V	76.6 +/- 2.3	45.5	61.
Mn	10100 +/- 400	9140.	94.
Fe	33800 +/- 1000	27000.	82.
Ni	14.3 +/- 1.0	10.4	78.
Cu	2950 +/- 130	2860.	100.
Zn	6952 +/- 91	7340.	104.
As	626 +/- 38	577.	98.
Ag	35.3 +/- 1.5	20.7	61.
Cd	21.8 +/- 0.2	19.6	91.
Sn	38.4 +/- 3	4.7	13.
Ba	707 +/- 51	318.	48.
Pb	5532 +/- 80	5380.	99.

[a]National Institute of Standards and Technology Standard Reference Material 2710: Montana Soil.

NIST 2704 Buffalo River Sediment[b]

Ele	Actual Conc	Meas. Conc	% Rec[c]
Li	47.5 +/- 4.1	29.5	68.
Na	5470 +/- 140	227.	4.3
Mg	12000 +/- 200	8910.	76.
Al	61100 +/- 1600	29500.	50.
K	20000 +/- 400	8270.	42.
Ca	26000 +/- 300	18100.	70.
Ti	4570 +/- 180	152.	3.5
V	95 +/- 4	43.3	48.
Cr	135 +/- 5	83.	64.
Mn	555 +/- 19	565.	100.
Fe	41100 +/- 1000	32100.	80.
Co	14 +/- 0.6	10.6	79.
Ni	44.1 +/- 3	33.2	81.
Cu	98.6 +/- 5	81.3	87.
Zn	438 +/- 12	370.	87.
As	23.4 +/- 0.8	18.9	84.
Cd	3.45 +/- 0.22	3.08	95.
Sb	3.79 +/- 0.15	0.57	16.
Ba	414 +/- 12	145.	36.
Tl	1.06 +/- 0.07	0.66	67.
Pb	161 +/- 17	128.	89.
U	3.13 +/- 0.13	1.05	35.

[b]National Institute of Standards and Technology Standard Reference Material 2704: Buffalo River Sediment.

[c]%Rec = percent recovery calculated based on upper or lower limit of certified range.

QC Table SQ5. Percent relative standard deviations in measured elemental concentrations (ng/mL) from a triplicate digestion and semi-quantitative analysis of a SEMO sediment sample.

Ele	44065 Rep 1	44065 Rep 2	44065 Rep 3	Mean	SD	%RSD[a]
Li	5.43	5.94	5.77	5.7	0.26	4.6
Be	0.40	0.54	0.47	0.5	0.07	14
Na	< 40	< 40	50.8	---	---	---
Mg	3010	3760	3350	3370	376	11
Al	10700	11600	11300	11200	458	4.1
K	1520	1600	1600	1570	46.2	2.9
Ca	6120	7570	6720	6800	729	11
Ti	185	190	194	189	4.63	2.4
V	19.8	20.6	20.4	20.2	0.43	2.1
Cr	15.5	16.8	16.0	16.1	0.65	4.1
Mn	412	578	437	475	89.3	19
Fe	8740	9060	9016	8940	173	1.9
Co	6.70	6.85	6.83	6.8	0.08	1.2
Ni	10.8	11.8	11.6	11.4	0.53	4.6
Cu	12.3	12.7	12.5	12.5	0.20	1.6
Zn	142	149	146	146	3.43	2.4
Ga	5.69	6.21	6.12	6.0	0.28	4.6
Ge	0.12	0.08	0.09	0.1	0.02	21
As	2.81	3.46	3.18	3.2	0.33	10
Se	< 0.4	< 0.4	< 0.4	---	---	---
Br	3.78	7.08	7.10	6.0	1.91	32
Rb	11.5	12.4	12.0	12.0	0.45	3.8
Sr	11.4	11.9	11.4	11.5	0.28	2.5
Y	4.62	4.87	4.77	4.8	0.12	2.6
Zr	5.84	5.52	5.53	5.6	0.18	3.3
Nb	0.048	0.067	0.059	0.1	0.01	17
Mo	0.24	0.31	0.29	0.3	0.03	12
Ru	< 0.04	< 0.04	< 0.04	---	---	---
Pd	0.12	0.10	0.09	0.1	0.01	11
Ag	0.15	0.15	0.13	0.1	0.01	7.3
Cd	1.48	1.44	1.39	1.4	0.05	3.2
In	< 0.04	< 0.04	< 0.04	---	---	---
Sn	0.29	0.37	0.31	0.3	0.04	12

Ele	44065 Rep 1	44065 Rep 2	44065 Rep 3	Mean	SD	%RSD[a]
Sb	< 0.04	0.060	0.051	---	---	---
Te	< 0.4	< 0.4	< 0.4	---	---	---
Cs	0.75	0.81	0.79	0.78	0.03	3.6
Ba	323	468	454	415	80.1	19
La	8.28	9.20	8.55	8.68	0.47	5.5
Ce	18.4	20.1	19.0	19.2	0.85	4.4
Pr	2.88	3.23	2.91	3.01	0.19	6.4
Nd	9.90	10.9	10.1	10.3	0.53	5.2
Sm	1.87	1.95	1.94	1.92	0.05	2.5
Eu	0.44	0.45	0.44	0.44	0.008	1.8
Gd	1.73	1.96	1.83	1.84	0.11	6.2
Tb	0.24	0.24	0.26	0.25	0.009	3.8
Dy	1.29	1.40	1.33	1.34	0.056	4.2
Ho	0.21	0.22	0.22	0.22	0.006	3.0
Er	0.56	0.59	0.55	0.57	0.019	3.3
Tm	0.079	0.079	0.083	0.080	0.002	2.4
Yb	0.52	0.56	0.56	0.54	0.024	4.4
Lu	0.071	0.075	0.079	0.075	0.004	4.9
Hf	0.23	0.23	0.24	0.23	0.005	2.2
Ta	< 0.4	< 0.4	< 0.4	---	---	---
W	< 0.4	< 0.4	< 0.4	---	---	---
Re	< 0.4	< 0.4	< 0.4	---	---	---
Os	< 0.4	< 0.4	< 0.4	---	---	---
Ir	< 0.4	< 0.4	< 0.4	---	---	---
Pt	< 0.4	< 0.4	< 0.4	---	---	---
Au	< 0.4	< 0.4	< 0.4	---	---	---
Tl	0.12	0.13	0.12	0.12	0.010	8.1
Pb	308	331	328	322	12.5	3.9
Bi	< 0.04	0.056	0.043	---	---	---
U	0.32	0.34	0.32	0.33	0.010	3.1

[a]%RSD = percent relative standard deviation, calculated as [SD ÷ Mean] X 100.

QC Table SQ6. Percent relative standard deviations in measured elemental concentrations (ng/mL) from a triplicate digestion and semi-quantitative analysis of a SEMO sediment sample.

Ele	44089 Rep 1	44089 Rep 2	44089 Rep 3	Mean	SD	%RSD[a]
Li	10.7	10.7	9.49	10.3	0.70	6.8
Be	0.67	0.76	0.70	0.71	0.05	7.1
Na	89.8	88.4	69.8	82.7	11.2	14.
Mg	3470	3470	3320	3420	86.7	2.5
Al	20500	20500	18200	19700	1330	6.8
K	3100	3060	2510	2890	330	11
Ca	10500	10800	10600	10600	153	1.4
Ti	306	307	242	285	37.4	13
V	36.5	35.1	30.9	34.2	2.89	8.5
Cr	25.0	25.6	21.9	24.2	1.99	8.2
Mn	1040	1020	1030	1030	10.11	1.0
Fe	14700	14500	13700	14300	529	3.7
Co	9.87	9.60	9.60	9.69	0.16	1.6
Ni	18.7	18.1	17.9	18.2	0.43	2.3
Cu	16.2	16.5	16.2	16.3	0.21	1.3
Zn	98.0	96.2	92.9	95.7	2.60	2.7
Ga	10.6	10.6	9.1	10.1	0.86	8.5
Ge	0.16	0.14	0.10	0.14	0.03	22.
As	5.31	5.36	5.24	5.31	0.06	1.1
Se	< 0.4	< 0.4	< 0.4	---	---	---
Br	< 0.4	< 0.4	< 0.4	---	---	---
Rb	23.4	22.9	19.9	22.0	1.90	8.6
Sr	20.6	20.2	16.7	19.2	2.11	11
Y	11.1	10.8	9.9	10.6	0.62	5.8
Zr	11.9	11.6	8.4	10.6	1.91	18
Nb	< 0.04	< 0.04	0.051	---	---	---
Mo	0.52	0.44	0.45	0.47	0.05	9.7
Ru	< 0.4	< 0.4	< 0.4	---	---	---
Pd	0.11	0.16	0.09	0.12	0.04	30
Ag	0.17	0.19	0.18	0.18	0.01	4.5
Cd	0.70	0.68	0.64	0.67	0.03	4.8
In	< 0.4	< 0.4	< 0.4	---	---	---
Sn	1.83	1.56	0.97	1.45	0.44	30

Ele	44089 Rep 1	44089 Rep 2	44089 Rep 3	Mean	SD	%RSD[a]
Sb	0.055	0.043	0.063	0.054	0.010	18
Te	< 0.4	< 0.4	< 0.4	---	---	---
Cs	1.50	1.52	1.33	1.45	0.10	7.0
Ba	271	243	234	249	19.1	7.7
La	17.8	17.2	15.6	16.9	1.11	6.6
Ce	39.2	38.9	34.6	37.6	2.57	6.8
Pr	6.08	5.87	5.41	5.79	0.34	5.9
Nd	21.1	20.5	18.6	20.1	1.30	6.5
Sm	4.14	3.84	3.63	3.87	0.26	6.6
Eu	0.85	0.83	0.78	0.82	0.036	4.4
Gd	3.73	3.76	3.49	3.66	0.15	4.0
Tb	0.52	0.49	0.46	0.49	0.030	6.2
Dy	2.88	2.81	2.65	2.78	0.11	4.1
Ho	0.46	0.44	0.44	0.44	0.014	3.2
Er	1.22	1.16	1.16	1.18	0.035	3.0
Tm	0.17	0.16	0.15	0.16	0.008	5.2
Yb	1.19	1.13	1.08	1.14	0.053	4.7
Lu	0.15	0.15	0.14	0.14	0.006	4.4
Hf	0.46	0.45	0.29	0.40	0.10	25
Ta	< 0.4	< 0.4	< 0.4	---	---	---
W	< 0.4	< 0.4	< 0.4	---	---	---
Re	< 0.4	< 0.4	< 0.4	---	---	---
Os	< 0.4	< 0.4	< 0.4	---	---	---
Ir	< 0.4	< 0.4	< 0.4	---	---	---
Pt	< 0.4	< 0.4	< 0.4	---	---	---
Au	< 0.4	< 0.4	< 0.4	---	---	---
Tl	0.22	0.20	0.20	0.21	0.007	3.4
Pb	142	140	143	142	1.68	1.2
Bi	0.23	0.25	0.23	0.24	0.011	4.5
U	0.60	0.59	0.58	0.59	0.009	1.5

[a]%RSD = percent relative standard deviation, calculated as [SD ÷ Mean] X 100.

QCTable SQ7. Recovery of elements spiked into a SEMO sediment samples prior to acid digestion.

a. CERC# 44065 low

Element	Spike Conc (µg/g)	Unspiked Conc (µg/g)	Spk/Unspiked Ratio	Spiked Conc (µg/g)	% Recovery
Cr	190.	16.1	12.	198.	96.
Mn	190.	475.	0.4	808.	175.
Co	19.0	6.79	2.8	25.1	96.
Ni	190.	11.4	17.	193.	96.
Cu	190.	12.5	15.	200.	99.
Zn	951.	146.	6.5	1070.	97.
As	19.0	3.15	6.0	21.3	95.
Ag	19.0	0.15	131.	19.1	100.
Cd	19.0	1.43	13.	19.7	96.
Pb	190.	322.	0.6	592.	142.

b. CERC# 44065 high

Element	Spike Conc (µg/g)	Unspiked Conc (µg/g)	Spk/Unspiked Ratio	Spiked Conc (µg/g)	% Recovery
Cr	398.	16.1	25.	397.	96.
Mn	398.	475.	0.8	853.	95.
Co	39.8	6.79	5.9	45.5	97.
Ni	398.	11.4	35.	395.	96.
Cu	398.	12.5	32.	407.	99.
Zn	1992.	146.	13.7	2070.	97.
As	39.8	3.15	12.6	41.0	95.
Ag	39.8	0.15	274.	39.1	98.
Cd	39.8	1.43	28.	38.4	93.
Pb	398.	322.	1.2	767.	112.

a. CERC# 44089

Element	Spike Conc (µg/g)	Unspiked Conc (µg/g)	Spk/Unspiked Ratio	Spiked Conc (µg/g)	% Recovery
Cr	200.	24.2	8.3	193.	84.
Mn	200.	1030.	0.2	1290.	130.
Co	20.0	9.69	2.1	27.0	86.
Ni	200.	18.2	11.	188.	85.
Cu	200.	16.3	12.	192.	88.
Zn	1000.	95.7	10.	993.	90.
As	20.0	5.31	3.8	22.9	88.
Ag	20.0	0.18	113.	18.4	91.
Cd	20.0	0.67	30.	18.8	91.
Pb	200.	142.	1.4	286.	72.

a. CERC# 44089

Element	Spike Conc (µg/g)	Unspiked Conc (µg/g)	Spk/Unspiked Ratio	Spiked Conc (µg/g)	% Recovery
Cr	400.	24.2	17.	374.	88.
Mn	400.	1027.	0.4	1500.	118.
Co	40.0	9.69	4.1	46.1	91.
Ni	400.	18.2	22.	364.	86.
Cu	400.	16.3	25.	375.	90.
Zn	2000.	95.7	20.9	1930.	92.
As	40.0	5.31	7.5	42.3	93.
Ag	40.0	0.18	226.	38.6	96.
Cd	40.0	0.67	59.6	38.2	94.
Pb	400.	142.	2.8	560.	105.

QC Table SQ8. Blank equivalent concentrations (µg/g) of elements in digestion blanks for the SEMO sediment sample set.

Element	BEC Blk 1	BEC Blk 2	BEC Blk 3
Li	< 0.04	< 0.04	< 0.04
Be	< 0.04	< 0.04	< 0.04
Na	< 40	< 40	< 40
Mg	< 40	< 40	< 40
Al	< 0.04	< 0.04	< 0.04
K	< 40	< 40	< 40
Ca	< 40	< 40	< 40
Ti	< 0.4	< 0.4	< 0.4
V	1	1	0.8
Cr	< 0.04	< 0.04	< 0.04
Mn	< 0.04	< 0.04	< 0.04
Fe	< 4	< 4	< 4
Co	< 0.04	< 0.04	< 0.04
Ni	< 0.4	< 0.4	< 0.4
Cu	< 0.4	< 0.4	< 0.4
Zn	< 0.4	< 0.4	< 0.4
Ga	< 0.04	< 0.04	< 0.04
Ge	< 0.04	< 0.04	< 0.04
As	< 0.04	< 0.04	< 0.04
Se	< 0.4	< 0.4	< 0.4
Rb	< 0.04	< 0.04	< 0.04
Sr	< 0.4	< 0.4	< 0.4
Y	< 0.04	< 0.04	< 0.04
Zr	< 0.04	< 0.04	< 0.04
Nb	< 0.04	< 0.04	< 0.04
Mo	< 0.04	< 0.04	< 0.04
Ru	< 0.04	< 0.04	< 0.04
Pd	< 0.04	< 0.04	< 0.04
Ag	< 0.04	< 0.04	< 0.04
Cd	< 0.04	< 0.04	< 0.04
In	< 0.04	< 0.04	< 0.04
Sn	< 0.04	< 0.04	< 0.04

Element	BEC Blk 1	BEC Blk 2	BEC Blk 3
Sb	< 0.04	< 0.04	< 0.04
Te	< 0.04	< 0.04	< 0.04
Cs	< 0.04	< 0.04	< 0.04
Ba	< 0.4	< 0.4	< 0.4
La	< 0.04	< 0.04	< 0.04
Ce	< 0.04	< 0.04	< 0.04
Pr	< 0.04	< 0.04	< 0.04
Nd	< 0.04	< 0.04	< 0.04
Sm	< 0.04	< 0.04	< 0.04
Eu	< 0.04	< 0.04	< 0.04
Gd	< 0.04	< 0.04	< 0.04
Tb	< 0.04	< 0.04	< 0.04
Dy	< 0.04	< 0.04	< 0.04
Ho	< 0.04	< 0.04	< 0.04
Er	< 0.04	< 0.04	< 0.04
Tm	< 0.04	< 0.04	< 0.04
Yb	< 0.04	< 0.04	< 0.04
Lu	< 0.04	< 0.04	< 0.04
Hf	< 0.04	< 0.04	< 0.04
Ta	< 0.04	< 0.04	< 0.04
W	< 0.04	< 0.04	< 0.04
Re	< 0.04	< 0.04	< 0.04
Os	< 0.04	< 0.04	< 0.04
Ir	0.06	< 0.04	< 0.04
Pt	< 0.04	< 0.04	< 0.04
Au	< 0.04	< 0.04	< 0.04
Tl	< 0.04	< 0.04	< 0.04
Pb	< 0.04	< 0.04	< 0.04
Bi	< 0.04	< 0.04	< 0.04
U	< 0.04	< 0.04	< 0.04

QC Table SEM_AVS1. Performance of a standardized Na_2S used for instrument calibration verification during AVS determination of sediments.

BID[a]	Ele.	Run Date	Reference Solution	Actual Conc	Meas Conc 1	Meas Conc 2	% Error 1	% Error 2	ISOP[b]	Oper Init.
10/21/08	AVS	10/24/08	Na_2S	19.6	19.6	19.2	0.0	- 2.0	P.197	WGB

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]ISOP = instrumental standard operating procedure.

QC Table SEM_AVS2. Measured concentrations in continuing calibration blank (CCB) and independent calibration verification standard (ICVS) ran every 10 samples throughout the SEM quantitative analysis. Results in ug/L.

BID[a] & Run #	Ele.	CCB[b]	ICVS	% Rec (ICVS)[c]
10/21/08 Run #1	Ni	0.00032	14.7	98.
	Cu	0.00299	15.0	100.
	Zn	0.00368	205.	102.
	Cd	0.00021	4.05	101.
	Pb	0.00225	14.7	98.
10/21/08 Run #2	Ni	0.00031	14.4	96.
	Cu	0.00079	14.3	95.
	Zn	0.00075	198.	99.
	Cd	0.00039	4.08	102.
	Pb	0.00626	14.4	96.
10/21/08 Run #3	Ni	0.00138	14.5	97.
	Cu	0.00138	15.0	100.
	Zn	-0.00284	201.	100.
	Cd	-0.00045	3.98	100.
	Pb	0.00108	14.5	97.
10/21/08 Run #4	Ni	0.00036	14.4	96.
	Cu	0.00258	14.7	98.
	Zn	0.00111	202.	101.
	Cd	-0.00043	4.04	101.
	Pb	0.00080	14.5	96.
10/21/08 Run #5	Ni	0.00096	14.0	94.
	Cu	0.00112	14.3	96.
	Zn	0.00358	199.	99.
	Cd	0.00010	3.96	99.
	Pb	0.00270	14.3	96.
10/21/08 Run #6	Ni	0.00065	15.1	101.
	Cu	0.00269	14.9	99.
	Zn	0.00601	208.	104.
	Cd	-0.00009	4.10	103.
	Pb	-0.00027	14.7	98.
10/21/08 Run #7	Ni	0.00019	14.5	97.
	Cu	-0.00015	14.4	96.
	Zn	0.00128	202.	101.
	Cd	0.00042	4.00	100.
	Pb	-0.00044	14.2	95.
10/21/08 Run #8	Ni	0.00091	14.6	98.
	Cu	0.00128	14.3	96.
	Zn	0.00538	202.	101.
	Cd	0.00027	3.99	100.
	Pb	-0.00112	14.2	95.
10/21/08 Run #9	Ni	0.00093	14.5	97.
	Cu	0.00028	14.5	96.
	Zn	0.00707	202.	101.
	Cd	0.00021	3.97	99.
	Pb	-0.00118	14.1	94.
10/21/08 Run #10	Ni	-0.00042	14.2	95.
	Cu	0.00146	14.0	94.
	Zn	0.03620	200.	100.
	Cd	0.00012	3.92	98.
	Pb	-0.00146	13.8	92.

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]acceptance criteria for CCB is +/- 3 X IDL for each element.

[c]acceptance criteria for ICVS = +/- 10% (90% - 110%).
ICVS = 15ppb for Ni,Cu, Pb; 200ppb for Zn; 4ppb for Cd.

QC Table SEM_AVS3. Measured concentrations of sulfide in 1N HCl extracted sediment reference materials.

BID[a]	Ele.	QC #	Meas. Conc.	Reference Material	Matrix	Upper Limit	Lower Limit	% Rec[d]	Prep SOP	Prep Init.	ISOP[b]	Oper. Init.
10/21/08	AVS	61	193.	NIST 1645	river sediment	240	160	100.	P.197	WGB	P.197	NMR

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]ISOP = instrumental standard operating procedure.

[c]NIST 1645 River Sediment = National Institute of Standards and Technology SRM 1645 River Sediment extracted with 1 N HCl; results in ug/g dry weight.

[d]%Rec = percent recovery calculated based on upper or lower limit of certified range.

QC Table SEM_AVS4. Concentrations of elements measured by 1M HCl extraction as compared with certified total concentrations in a reference sediment.

National Institute of Standards and Technology Standard Reference Material 1645: River Sediment.

Element	Certifed Total Conc	Meas. Conc	Recovery[a] (%)
Ni	45.8 +/- 2.9	14.7	34.3%
Cu	109 +/- 19	41.1	45.7%
Zn	1720 +/- 170	1100.	71.0%
Cd	10.2 +/- 1.5	5.61	64.5%
Pb	714 +/- 28	449.	65.5%

[a] compared to total metal upper or lower 95% C.I.

QC Table SEM_AVS5. Relative percent difference from the duplicate 1N HCL extraction and analysis of a sediment sample.

Analysis Date	Analyte	CERC#	Matrix	Dup 1	Dup 2	Mean	Units	Diff[a]	RPD[b]
10/21/08	AVS	44119	sediment extract	0.056	0.064	0.060	µmol/g	-0.008	13.
01/15/09	Ni	44119	sediment extract	1.8	1.7	1.8	µg/g	0.12	6.8
01/15/09	Cu	44119	sediment extract	1.6	1.6	1.6	µg/g	0.01	0.7
01/15/09	Zn	44119	sediment extract	76.	68.	72.	µg/g	7.63	11.
01/15/09	Cd	44119	sediment extract	0.99	0.92	0.96	µg/g	0.08	7.9
01/15/09	Pb	44119	sediment extract	209.	218.	214.	µg/g	8.86	4.1

[a]Diff = Dup 1 - Dup 2.

[b]RPD = relative percent difference, calculated as Diff/Mean X 100; target criteria +/- 10%

QC Table SEM_AVS6. Relative percent difference from the duplicate analysis of sediment extracts.

Analysis Date	Ele.	Matrix	CERC#	Dup 1	Dup 2	Mean	Units	Diff[a]	RPD[b]	PSOP	Prep. Init.	ISOP[c]	Oper. Init.
01/16/09	Fe	sediment extract	44156	1459.	1453.	1456.	ng/mL	6.56	0.5	P.197	WGB/MJW	P.241	VDM/TWM
01/16/09	Mn	sediment extract	44156	28.7	28.7	28.7	ng/mL	0.027	0.1	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Ni	sediment extract	44097	20.1	20.3	20.2	ng/mL	0.21	1.0	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Cu	sediment extract	44097	19.6	19.4	19.5	ng/mL	0.15	0.7	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Zn	sediment extract	44097	148.	149.	149.	ng/mL	0.34	0.2	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Cd	sediment extract	44097	5.82	5.87	5.84	ng/mL	0.045	0.8	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Pb	sediment extract	44097	25.2	25.4	25.3	ng/mL	0.20	0.8	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Ni	sediment extract	44148	21.8	21.6	21.7	ng/mL	0.19	0.9	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Cu	sediment extract	44148	18.9	18.9	18.9	ng/mL	0.018	0.1	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Zn	sediment extract	44148	161.	161.	161.	ng/mL	0.31	0.2	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Cd	sediment extract	44148	6.01	6.11	6.06	ng/mL	0.098	1.6	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Pb	sediment extract	44148	22.8	23.0	22.9	ng/mL	0.20	0.9	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Ni	sediment extract	44156	24.0	24.3	24.2	ng/mL	0.29	1.2	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Cu	sediment extract	44156	24.1	24.4	24.2	ng/mL	0.25	1.0	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Zn	sediment extract	44156	162.	163.	163.	ng/mL	1.18	0.7	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Cd	sediment extract	44156	6.08	6.14	6.11	ng/mL	0.065	1.1	P.197	WGB/MJW	P.241	VDM/TWM
01/15/09	Pb	sediment extract	44156	21.9	22.1	22.0	ng/mL	0.23	1.1	P.197	WGB/MJW	P.241	VDM/TWM

[a]Diff = Dup 1 - Dup 2; samples spiked with mid-range standard prior to analysis.

[b]RPD = relative percent difference, calculated as Diff/Mean X 100; target criteria +/- 10%

[c]ISOP = standard operating procedure used for instrumental analysis of sample.

QC Table SEM_AVS7. Percent recovery of sulfide in 1N HCL extracted blanks.

BID[a]	Ele.	Spike Form	Spk Amt[b]	Matrix	Spiked[c] µg	Unspiked µg	Spk/Unspkd	Spk/Unspkd SD	% REC[d]	PSOP	Prep. Init.	ISOP	Oper. Init.
10/21/08	AVS	NaS	628.	blank extract	615.	0.075	8370.	---	98.	P.197	WGB	P.197	WGB
10/21/08	AVS	NaS	628.	blank extract	667.	0.075	8370.	---	106.	P.197	WGB	P.197	WGB

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]Spk Amt = the ug amount of the spike added to a sample .

[c]Spiked = µg of the analyte in the sample spike measured by the instrument (spike + unspiked).

[d]%REC = Spiked Conc - Unspiked Conc divided by the Spk Amt. X 100.

QC Table SEM_AVS8. Spike recoveries for 1N HCL extracted blanks and digested sediment extracts.

BID[a]	Ele.	Spike Type	Units	Spk Amt[b]	Vol (mL) or Wgt.(g)	Effec. Conc	Unspiked Conc	Spiked[c] Conc	% REC[d]	PSOP	Prep. Init.	ISOP	Oper. Init.
10/21/08	Ni	Blank - SEM	µg/g	3.33	3.30	1.01	0.20	1.18	97.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Cu	Blank - SEM	µg/g	3.33	3.30	1.01	0.033	0.95	91.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Zn	Blank - SEM	µg/g	50.0	3.30	15.2	0.16	14.7	96.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Cd	Blank - SEM	µg/g	1.00	3.30	0.30	0.002	0.30	98.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Pb	Blank - SEM	µg/g	3.33	3.30	1.01	0.023	0.98	94.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Ni	Blank - SEM	µg/g	3.33	3.30	1.01	0.20	0.92	72.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Cu	Blank - SEM	µg/g	3.33	3.30	1.01	0.033	0.94	89.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Zn	Blank - SEM	µg/g	50.0	3.30	15.2	0.16	14.2	93.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Cd	Blank - SEM	µg/g	1.00	3.30	0.30	0.002	0.28	92.	P.197	JWA/WGB	P.241	VDM/TWM
10/21/08	Pb	Blank - SEM	µg/g	3.33	3.30	1.01	0.023	0.95	92.	P.197	JWA/WGB	P.241	VDM/TWM

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]Spk Amt = the absolute µg or ng amount of the spike added to a sample .

[c]Spiked Conc = concentration of the analyte in the sample spike measured by the instrument (spike + unspiked).

[d]%REC = Spiked Conc - Unspiked Conc divided by the Spk Amt. X 100.

QC Table SEM_AVS9. Percent recovery of AVS in post-extraction spikes.

BID[a]	Ele.	Spike Type	Units	Spk Amt[b]	Vol.	Effec. Conc	Unspiked Conc	Spiked[c] Conc	% REC[d]	PSOP	Prep. Init.	ISOP	Oper. Init.
10/21/08	AVS	sediment extract	µmol	9.8	1.0	9.8	4.2	12.8	87.	P.197	WGB	P.197	WGB
10/21/08	AVS	sediment extract	µmol	9.8	1.0	9.8	2.1	12.2	103.	P.197	WGB	P.197	WGB
10/21/08	AVS	sediment extract	µmol	9.8	1.0	9.8	2.5	12.4	101.	P.197	WGB	P.197	WGB

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]Spk Amt = the absolute µmol amount of the spike (S) added to a sample .

[c]Spiked Conc = µmol of the analyte (S) in the sample spike measured by the instrument (spike +unspiked).

[d]%REC = Spiked Conc - Unspiked Conc divided by the Spk Amt. X 100.

QC Table SEM_AVS10. Percent recoveries of SEMs in post-extraction spikes.

BID[a]	Ele.	Spike Type	Units	Spk Amt[b]	Vol.	Effec. Conc	Unspiked Conc	Spiked[c] Conc	% REC[d]	PSOP	Prep. Init.	ISOP	Oper. Init.
10/21/08	Fe	44157 - Analytical	ng/mL	10000.	10.	1000.	429.	1591.	116.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Mn	44157 - Analytical	ng/mL	200.	10.	20.	7.52	31.6	120.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Ni	44097 - Analytical	ng/mL	200.	10.	20.	1.05	20.5	97.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Cu	44097 - Analytical	ng/mL	200.	10.	20.	0.78	19.8	95.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Zn	44097 - Analytical	ng/mL	1500.	10.	150.	5.20	152.	98.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Cd	44097 - Analytical	ng/mL	60.	10.	6.	0.037	5.99	99.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Pb	44097 - Analytical	ng/mL	200.	10.	20.	6.82	25.7	94.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Ni	44149 - Analytical	ng/mL	200.	10.	20.	2.75	21.8	95.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Cu	44149 - Analytical	ng/mL	200.	10.	20.	0.46	19.1	93.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Zn	44149 - Analytical	ng/mL	1500.	10.	150.	8.72	158.	100.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Cd	44149 - Analytical	ng/mL	60.	10.	6.	0.056	6.11	101.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Pb	44149 - Analytical	ng/mL	200.	10.	20.	3.51	23.1	98.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Ni	44157 - Analytical	ng/mL	200.	10.	20.	4.20	23.8	98.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Cu	44157 - Analytical	ng/mL	200.	10.	20.	4.51	23.9	97.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Zn	44157 - Analytical	ng/mL	1500.	10.	150.	13.9	161.	98.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Cd	44157 - Analytical	ng/mL	60.	10.	6.	0.12	6.10	100.	P.197	JWA/WGB	P.241	VDMTWM
10/21/08	Pb	44157 - Analytical	ng/mL	200.	10.	20.	2.48	21.7	96.	P.197	JWA/WGB	P.241	VDMTWM

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]Spk Amt = the absolute ng amount of the spike added to a sample .

[c]Spiked Conc = ng/mL of the analyte in the sample spike measured by the instrument (spike + unspiked).

[d]%REC = Spiked Conc - Unspiked Conc divided by the Spk Amt. X 100.

QC Table SEM_AVS11. Interference check of sediment SEM by 5-fold dilution.

BID[a]	Run Date	Sample Used	Sample Type	Element	Undiluted Sample	Diluted Sample[b]	% Diff[c]
10/21/08	01/16/09	44158	sediment extract	Fe	1370.	275.	0.4
10/21/08	01/16/09	44158	sediment extract	Mn	27.4	5.51	0.3
10/21/08	01/15/09	44099	sediment extract	Ni	23.0	4.57	0.6
10/21/08	01/15/09	44099	sediment extract	Cu	23.0	4.79	4.0
10/21/08	01/15/09	44099	sediment extract	Zn	150.	30.7	2.2
10/21/08	01/15/09	44099	sediment extract	Cd	5.98	1.22	2.0
10/21/08	01/15/09	44099	sediment extract	Pb	25.8	5.35	3.9
10/21/08	01/15/09	44150	sediment extract	Ni	21.5	4.44	3.2
10/21/08	01/15/09	44150	sediment extract	Cu	18.8	3.95	4.9
10/21/08	01/15/09	44150	sediment extract	Zn	158.	32.3	2.1
10/21/08	01/15/09	44150	sediment extract	Cd	6.06	1.22	0.7
10/21/08	01/15/09	44150	sediment extract	Pb	22.5	4.62	3.0
10/21/08	01/15/09	44158	sediment extract	Ni	23.8	4.73	0.6
10/21/08	01/15/09	44158	sediment extract	Cu	23.9	4.81	0.5
10/21/08	01/15/09	44158	sediment extract	Zn	160.	31.8	0.7
10/21/08	01/15/09	44158	sediment extract	Cd	6.13	1.20	2.2
10/21/08	01/15/09	44158	sediment extract	Pb	21.7	4.34	0.1

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]dilution factor = 5 (1+4); sample spiked with a mid range standard prior to analysis.

[c]dilution % difference acceptance criteria = +/- 10%; concentrations exceeding +/- 10%. indicative of suspect interferent.

QC Table SEM_AVS 12. Blank equivalent concentration (BEC) for the AVS procedure.

BID[a]	Ele.	Matrix	Soln Units	Blk Conc 1	Blk Conc 2	Blk Conc 3	Dil Vol (mL)	Mean Conc	Wgt (g)[b]	Mean BEC	BEC SD	PSOP	Prep Init.	ISOP[c]	Analyst
10/21/08	AVS	sediment extract	µmol/g	0.00035	0.00024	0.00017	1.0	0.0003	2.5	0.0001	0.00004	P.197	WGB	P.197	WGB

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]dry weight (g) for samples used to compute BEC.

[c]ISOP = standard operating procedure used for instrumental analysis of sample.

QC Table SEM_AVS13. Blank equivalent concentrations (BECs) for the sediment extraction.

BID[a]	Ele.	Matrix	Soln Units	Blk Conc 1	Blk Conc 2	Blk Conc 3	Dil Vol (mL)	Mean (µg)	Wgt (g)[b]	Mean BEC µg/g	BEC SD	PSOP	Prep Init.	ISOP[c]
10/21/08	Fe	sediment extract	ng/mL	-0.36	-0.57	-1.20	5000.	- 3.55	3.30	-1.08	0.66	P.197	WGB/JWA	P.241
10/21/08	Mn	sediment extract	ng/mL	0.004	0.007	0.011	5000.	0.04	3.30	0.011	0.005	P.197	WGB/JWA	P.241
10/21/08	Ni	sediment extract	ng/mL	0.37	0.009	0.005	5000.	0.65	3.30	0.20	0.32	P.197	WGB/JWA	P.241
10/21/08	Cu	sediment extract	ng/mL	0.033	0.017	0.015	5000.	0.11	3.30	0.033	0.015	P.197	WGB/JWA	P.241
10/21/08	Zn	sediment extract	ng/mL	0.12	0.10	0.099	5000.	0.54	3.30	0.16	0.019	P.197	WGB/JWA	P.241
10/21/08	Cd	sediment extract	ng/mL	0.002	0.002	0.001	5000.	0.008	3.30	0.002	0.001	P.197	WGB/JWA	P.241
10/21/08	Pb	sediment extract	ng/mL	0.016	0.017	0.012	5000.	0.076	3.30	0.023	0.004	P.197	WGB/JWA	P.241

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]dry sediment weight used to compute BECs.

[c]ISOP = standard operating procedure used for instrumental analysis of sample.

QC Table SEM_AVS14. Instrumental and method detection limits for the AVS procedure.

IDL[a]

BID	Run Date	Element	Std Conc	SD 1	SD 2	SD 3	IDL	IDL SOP	Oper Init
10/21/08	08/29/02	AVS	0.0084	0.0011	0.0010	0.0008	0.003	C4.103	WGB

[a]IDL = instrument detection limit (umol), computed as 3 X mean of standard deviations from analysis of 0 standard.

MDL[b]

BID	Element	Matrix	W/D/L[c]	Sample SD	Blank SD	MDL	PSOP	Prep Init	ISOP	Oper Init	Units
10/21/08	AVS	sediment extract	D	0.00	0.00004	0.0001	P.197	NMR/WGB	P.197	WGB	µmol/g

[b]MDL = method detection limit (uM/g), computed as $3 \times (SD_{st}^2 + SD_s^2)^{1/2}$ where Sample SD = standard deviation of low sample and Blank SD = standard deviation of a reagent blank.

[c]D = dry; MDL expressed as µmol/g dry weight.

QC Table PW Metals1. Concentrations of elements in a continuing calibration blank (CCB) and independent calibration verification standard (ICVS) ran every 10 samples throughout the water analysis. Results expressed as ug/L.

BID[a]	Element	CCB[b]	ICVS	% Rec (ICVS)[c]
	Mn	0.00073	15.4	103.
Run #1	Cu	-0.00017	15.4	103.
	Ni	0.00014	15.1	101.
	Zn	0.01338	205.	103.
	Cd	-0.00036	4.08	102.
	Pb	0.00244	15.1	101.
	Mn	0.00120	15.2	101.
Run #2	Cu	0.00414	15.3	102.
	Ni	-0.00537	15.1	101.
	Zn	0.01798	204.	102.
	Cd	0.00003	4.06	101.
	Pb	0.00214	15.0	100.
	Mn	-0.00042	15.2	101.
Run #3	Cu	0.00220	15.5	103.
	Ni	-0.01174	15.1	101.
	Zn	-0.04800	205.	103.
	Cd	-0.00035	4.11	103.
	Pb	-0.00223	15.3	102.
	Mn	0.00103	15.2	102.
Run #4	Cu	0.00242	15.4	103.
	Ni	-0.00450	15.1	100.
	Zn	-0.04799	207.	103.
	Cd	-0.00110	4.09	102.
	Pb	-0.00221	15.4	103.
	Mn	0.00096	15.2	102.
Run #5	Cu	-0.00046	15.6	104.
	Ni	-0.00606	15.2	101.
	Zn	-0.04135	207.	103.
	Cd	0.00056	4.09	102.
	Pb	-0.00192	15.3	102.
	Mn	0.00141	15.2	101.
Run #6	Cu	0.00198	15.1	101.
	Ni	0.00946	14.8	99.
	Zn	0.01103	202.	101.
	Cd	-0.00025	3.98	100.
	Pb	0.00338	14.9	99.
	Mn	0.00073	15.0	100.
Run #7	Cu	0.00170	14.9	99.
	Ni	0.00004	14.6	97.
	Zn	0.01765	199.	100.
	Cd	0.00019	3.97	99.
	Pb	0.00107	14.9	100.
	Mn	0.00009	14.9	100.
Run #8	Cu	-0.00084	14.7	98.
	Ni	0.00159	14.7	98.
	Zn	0.00599	197.	98.
	Cd	-0.00023	3.93	98.
	Pb	0.00158	14.6	97.
	Mn	0.00149	15.2	102.
Run #9	Cu	0.00146	15.2	101.
	Ni	-0.00319	14.9	100.
	Zn	-0.00091	203.	101.
	Cd	0.00101	3.99	100.
	Pb	0.00288	15.1	100.
	Mn	0.00263	15.3	102.
Run #10	Cu	0.00107	15.0	100.
	Ni	-0.00555	14.8	99.
	Zn	0.00541	201.	101.
	Cd	0.00016	3.98	100.
	Pb	0.00087	14.7	98.
	Mn	0.00233	15.0	100.
Run #11	Cu	-0.00051	14.8	99.
	Ni	0.00802	14.6	98.
	Zn	-0.00446	198.	99.
	Cd	0.00100	3.95	99.
	Pb	0.00106	14.4	96.
	Mn	0.00363	14.8	98.
Run #12	Cu	-0.00076	14.5	96.
	Ni	0.01313	14.4	96.
	Zn	0.00343	195.	98.
	Cd	0.00087	3.88	97.
	Pb	0.00066	14.4	96.
	Mn	0.00102	14.5	97.
Run #13	Cu	-0.00197	14.3	95.
	Ni	0.00598	14.1	94.
	Zn	-0.03354	191.	96.
	Cd	-0.00053	3.83	96.
	Pb	-0.00069	14.1	94.
	Mn	0.00094	14.4	96.
Run #14	Cu	-0.00333	14.2	95.
	Ni	0.00816	14.0	93.
	Zn	-0.02831	190.	95.
	Cd	-0.00309	3.79	95.
	Pb	-0.00126	13.9	93.

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]acceptance criteria for CCB is +/- 3 X IDL for each element.

[c]acceptance criteria for ICVS = +/- 10% (90% - 110%).

ICVS = 15ppb for Mn,Cu,Ni and Pb; 200ppb for Zn, and 4ppb for Cd.

QC Table PW Metals2. Percent relative standard deviation from repeated analysis of Metals in Drinking Water Standard[a] during a semi-quantitative sample run of pore-water samples. Results expressed in ng/mL unless otherwise noted.

Ele.	Run #1	Run #2	Run #3	Run #4	Actual Conc	Mean Conc	SD	% RSD
Li	20.1	21.1	20.5	20.2	20.	20.5	0.4	2.2
Be	19.8	20.1	19.5	20.7	20.	20.0	0.5	2.5
Na[b]	6.26	6.41	6.77	6.53	6.0	6.49	0.2	3.3
Mg[b]	9.27	9.72	9.8	9.77	9.0	9.65	0.3	2.7
Al	120.	123.	123.	120.	120.	121.	1.8	1.5
K[b]	3.49	3.60	3.63	3.54	2.5	3.57	0.1	1.8
Ca[b]	34.4	34.7	35.0	34.8	35.	34.7	0.3	0.8
V	29.8	30.0	29.8	29.7	30.	29.8	0.1	0.4
Cr	19.5	19.8	19.6	19.5	20.	19.6	0.2	0.8
Mn	39.3	39.5	39.7	38.7	40.	39.3	0.4	1.1
Fe	163.	165.	162.	162.	100.	163.	1.6	1.0
Co	24.7	25.1	24.46	24.2	25.	24.6	0.4	1.5
Ni	58.9	59.7	59.3	58.8	60.	59.2	0.4	0.8
Cu	19.1	19.8	19.2	19.1	20.	19.3	0.3	1.7
Zn	67.9	70.5	67.8	68.8	70.	68.7	1.2	1.8
As	78.6	80.9	80.0	80.0	80.	79.9	1.0	1.2
Se	9.48	9.77	9.6	10.0	10.	9.72	0.2	2.1
Rb	11.9	12.1	11.6	11.4	10.	11.8	0.3	2.6
Sr	330.	344.	341.	326.	250.	335.	8.5	2.5
Mo	98.	103.	100.	98.	100.	100.	2.3	2.3
Ag	1.98	2.05	1.98	1.93	2.0	1.99	0.0	2.5
Cd	9.52	10.0	9.74	9.62	10.	9.71	0.2	2.0
Sb	9.69	10.2	9.90	10.0	10.	9.95	0.2	2.1
Te	2.90	3.04	2.95	3.00	3.0	2.97	0.1	2.0
Ba	49.2	51.7	50.4	48.1	50.	49.8	1.5	3.1
Pr	9.98	10.5	10.3	10.9	10.	10.4	0.4	3.6
Tb	9.93	10.1	10.1	10.6	10.	10.2	0.3	3.0
Tm	10.01	10.4	10.4	10.7	10.	10.4	0.3	2.8
Ta	10.3	9.93	9.35	10.5	10.	10.0	0.5	5.0
Au	0.50	0.47	0.45	0.48	10.	0.48	0.0	4.4
Tl	9.90	10.0	10.2	9.62	10.	9.93	0.2	2.4
Pb	40.9	40.2	40.7	39.0	40.	40.2	0.8	2.1
Bi	8.21	8.15	8.38	8.01	10.	8.19	0.2	1.9
U	10.2	10.1	10.3	9.89	10.	10.1	0.2	1.8

[a]High Purity Trace Metals in Drinking Water, Cat # CRM-TMDW, Charleston, SC.; Pr, Tb, Tm, Ta, and Au manually added to represent rare earth region of the mass spectral range.

[b]concentrations are ppm (µg/mL)

QC Table PW Metals3. Recoveries of elements from a reference solution used as a laboratory control sample in the ICP-MS quantitative analysis of pore-water samples.

BID	Analysis Date	Reference Material	Element	Actual Conc.	n	Mean Meas. Conc.	% Rec[a]	ISOP	Oper. Init.
09/05/08	10/24/08	NIST 1643e[c]	Mn	38.97 +/- 0.45	2	39.6	100.	P.241	VDM/TWM
09/05/08	10/24/08	NIST 1643e[c]	Cu	22.76 +/- 0.31	2	21.6	96.	P.241	VDM/TWM
09/05/08	10/24/08	NIST 1643e[c]	Ni	62.41 +/- 0.69	2	61.2	99.	P.241	VDM/TWM
09/05/08	10/24/08	Spex ICS -1[b]	Zn	200 +/- 20	2	206.	100.	P.241	VDM/TWM
09/05/08	10/24/08	NIST 1643e[c]	Cd	6.568 +/- 0.073	2	6.26	96.	P.241	VDM/TWM
09/05/08	10/24/08	NIST 1643e[c]	Pb	19.63 +/- 0.21	2	19.2	99.	P.241	VDM/TWM

[a]%Rec = 100% if within range, otherwise calculated based on upper or lower limit of range.

[a]Spex ICS-1 = SPEX ClaritasPPT Instrument Check Standard 1; Cat No. CL-ICS-1; Spec Certiprep, Metuchen, NJ; Solution used as laboratory control sample.

[b]NIST 1643e = National Institute of Standards and Technology Standard Reference Material Trace Elements in Water 1643e. Concentration results expressed as ng/mL. Solution used as laboratory control sample.

QC Table PW Metals4. Recovery of elements from laboratory control samples with semi-quantitative analysis of pore-water samples.

a. SPEX ClaritasPPT[a]

Element	Actual Conc	Meas Conc	% Rec
Be	50.	56.	113.
Na	500.	532.	106.
Mg	500.	401.	80.
Al	50.	52.	104.
K	500.	713.	143.
Ca	500.	506.	101.
Ti	50.	51.	101.
V	50.	50.	101.
Cr	50.	50.	99.
Mn	50.	51.	101.
Fe	500.	580.	116.
Co	50.	52.	103.
Ni	50.	52.	104.
Cu	50.	53.	106.
Zn	50.	57.	115.
As	50.	54.	107.
Se	50.	55.	111.
Sr	50.	46.	92.
Mo	50.	47.	93.
Ag	50.	52.	104.
Cd	50.	50.	101.
Sn	50.	62.	123.
Sb	50.	50.	100.
Ba	50.	50.	99.
Tl	50.	52.	103.
Pb	50.	54.	107.

[a]a mixture of SPEX Claritas PPT Instrument Check Standards 1 (CL-ICS-1), 3 (CL-ICS-3, and 5 (CL-ICS-5); SPEX CertiPrep, Inc., Metuchen, NJ; units ng/mL.

b. SPEX Custom Multielement Standards[b]

Element	Actual Conc	Meas Conc	% Rec
Pr	10.	9.98	100.
Tb	10.	9.66	97.
Tm	10.	10.0	100.
Ta	10.	10.9	109.
Ir	10.	9.90	99.

[b] a mixture of SPEX Custom Multielement Standards XCERCMO-1 and XCERCMO-2; SPEX CertiPrep, Inc., Metuchen, NJ; units ng/mL.

QC Table PW Metals5. Percent change in internal standards during the ICP-MS semi-quantitative run of pore-water samples.

BID	Run Date	IS	Conc (ppb)	Matrix	Initial Intensity	End Intensity	% Change
11/11/08	11/14/08	Sc	10.	pore water	138481	149501	7.4
11/11/08	11/14/08	Rh	10.	pore water	165985	174499	4.9
11/11/08	11/14/08	Th	10.	pore water	247905	261363	5.1

QC Table PW Metals6. Relative percent difference for duplicate analysis of pore water by ICP-MS.

BID[a]	Duplicate Type	Matrix	Element	Dup 1	Dup 2	Diff[b]	Mean	RPD[c]	ISOP[d]	Oper. Init.
09/05/08	44121 - Analytical	water	Mn	36.8	36.7	0.10	36.7	0.3	P.241	VDM/TWM
09/05/08	44121 - Analytical	water	Cu	18.2	18.3	0.13	18.2	0.7	P.241	VDM/TWM
09/05/08	44121 - Analytical	water	Ni	18.0	18.2	0.13	18.1	0.7	P.241	VDM/TWM
09/05/08	44121 - Analytical	water	Zn	139.	140.	1.07	139.	0.8	P.241	VDM/TWM
09/05/08	44121 - Analytical	water	Cd	5.51	5.48	0.03	5.49	0.5	P.241	VDM/TWM
09/05/08	44121 - Analytical	water	Pb	17.9	18.2	0.29	18.1	1.6	P.241	VDM/TWM
09/05/08	44123 - Analytical	water	Mn	37.6	37.5	0.08	37.5	0.2	P.241	VDM/TWM
09/05/08	44123 - Analytical	water	Cu	18.8	18.8	0.03	18.8	0.2	P.241	VDM/TWM
09/05/08	44123 - Analytical	water	Ni	18.7	19.0	0.30	18.9	1.6	P.241	VDM/TWM
09/05/08	44123 - Analytical	water	Zn	144.	144.	0.25	144.	0.2	P.241	VDM/TWM
09/05/08	44123 - Analytical	water	Cd	5.60	5.60	0.00	5.60	0.0	P.241	VDM/TWM
09/05/08	44123 - Analytical	water	Pb	19.0	19.3	0.21	19.2	1.1	P.241	VDM/TWM

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]Diff = Dup 1 - Dup 2; digestates spiked with mid-range standard prior to analysis.

[c]RPD = relative percent difference, calculated as Diff/Mean X 100; acceptance criteria +/- 10%.

[d]ISOP = standard operating procedure used for instrumental analysis of sample (SOP P.241).

QC Table PW Metals7. Relative percent differences in measured elemental concentrations (ng/mL) from a duplicate collection and semi-quantitative analysis of a pore water sample.

Ele	43989	43990	Mean	Diff	RPD[a]
Li	0.2	0.2	0.2	0.0	0.0
Be	< 0.1	< 0.1	---	---	---
Na	3	3	3.	0.	0.0
Mg	30	30	30.	0.0	0.0
Al	110	170	140.	60.	43.
K	2	2	2.	0.	0.0
Ca	50	50	50.	0.	0.0
Ti	3	4	4.	1.0	29.
V	0.8	0.9	1.	0.1	12.
Cr	< 0.1	< 0.1	---	---	---
Mn	2470	2540	2510.	70.0	2.8
Fe	40	50	45.	10.	22.
Co	2	2	2.	0.0	0.0
Ni	2	2	2.	0.0	0.0
Cu	< 1	< 1	---	---	---
Zn	10	9	10.	1.	11.
Ga	0.3	0.3	0.	0.0	0.0
Ge	< 0.1	< 0.1	---	---	---
As	1	1	1.	0.0	0.0
Se	< 1	< 1	---	---	---
Br	80	80	80.	0.0	0.0
Rb	2	2	2.	0.0	0.0
Sr	50	50	50.	0.0	0.0
Y	0.2	0.2	0.	0.0	0.0
Zr	0.1	0.1	0.	0.0	0.0
Nb	< 0.1	< 0.1	---	---	---
Mo	1	1	1.	0.0	0.0
Ru	< 0.1	< 0.1	---	---	---
Pd	< 0.1	< 0.1	---	---	---
Ag	< 0.1	< 0.1	---	---	---
Cd	< 0.1	< 0.1	---	---	---
In	< 0.1	< 0.1	---	---	---
Sn	< 0.1	< 0.1	---	---	---

Ele	43989	43990	Mean	Diff	RPD[a]
Sb	0.5	0.5	0.5	0.0	0.0
Te	< 0.1	< 0.1	---	---	---
I	7	7	7.0	0.0	0.0
Cs	< 0.1	< 0.1	---	---	---
Ba	1096.6	831.78	964.2	264.8	27.
La	0.1	0.1	0.1	0.0	0.0
Ce	0.21	0.25	0.2	0.0	17.
Pr	< 0.1	< 0.1	---	---	---
Nd	0.1	0.1	0.1	0.0	0.0
Sm	< 0.1	< 0.1	---	---	---
Eu	0.15	0.13	0.1	0.0	14.
Gd	< 0.1	< 0.1	---	---	---
Tb	< 0.1	< 0.1	---	---	---
Dy	< 0.1	< 0.1	---	---	---
Ho	< 0.1	< 0.1	---	---	---
Er	< 0.1	< 0.1	---	---	---
Tm	< 0.1	< 0.1	---	---	---
Yb	< 0.1	< 0.1	---	---	---
Lu	< 0.1	< 0.1	---	---	---
Hf	< 0.1	< 0.1	---	---	---
Ta	< 0.1	< 0.1	---	---	---
W	< 0.1	< 0.1	---	---	---
Re	< 0.1	< 0.1	---	---	---
Os	< 0.1	< 0.1	---	---	---
Ir	< 0.1	< 0.1	---	---	---
Pt	< 0.1	< 0.1	---	---	---
Au	< 0.1	< 0.1	---	---	---
Tl	< 0.1	< 0.1	---	---	---
Pb	5	5	5.0	0.0	0.0
Bi	< 0.1	< 0.1	---	---	---
U	0.7	0.8	0.8	0.1	13.

[a]RPD = relative percent difference, calculated as [Diff ÷ Mean] X 100.

QC Table PW Metals8. Percent recovery of elements spiked in pore-water samples analyzed by ICP-MS.

BID[a]	Ele.	Spk Type	Matrix	Analysis Units	Spk Amt.[b] µg	Vol. (mL)	Effective[c] Conc.	Bkgd.[d] Conc.	Spk/ Bkgd	Total[e] Conc.	% Rec.[f]	ISOP	Oper. Init.
09/05/08	Mn	44121 - Analytical	water	ng/mL	100.	5.	20.0	17.6	1.	36.7	95.	P.241	VDM/TWM
09/05/08	Cu	44121 - Analytical	water	ng/mL	100.	5.	20.0	0.013	1520.	18.1	90.	P.241	VDM/TWM
09/05/08	Ni	44121 - Analytical	water	ng/mL	100.	5.	20.0	0.040	497.	18.0	90.	P.241	VDM/TWM
09/05/08	Zn	44121 - Analytical	water	ng/mL	750.	5.	150.	0.20	733.	139.	92.	P.241	VDM/TWM
09/05/08	Cd	44121 - Analytical	water	ng/mL	30.	5.	6.0	0.002	3120.	5.46	91.	P.241	VDM/TWM
09/05/08	Pb	44121 - Analytical	water	ng/mL	100.	5.	20.0	0.066	305.	18.2	91.	P.241	VDM/TWM
09/05/08	Mn	44123 - Analytical	water	ng/mL	100.	5.	20.0	18.8	1.	37.8	95.	P.241	VDM/TWM
09/05/08	Cu	44123 - Analytical	water	ng/mL	100.	5.	20.0	0.023	879.	18.9	94.	P.241	VDM/TWM
09/05/08	Ni	44123 - Analytical	water	ng/mL	100.	5.	20.0	0.10	191.	18.7	93.	P.241	VDM/TWM
09/05/08	Zn	44123 - Analytical	water	ng/mL	750.	5.	150.	1.63	92.	145.	96.	P.241	VDM/TWM
09/05/08	Cd	44123 - Analytical	water	ng/mL	30.	5.	6.0	0.029	210.	5.64	94.	P.241	VDM/TWM
09/05/08	Pb	44123 - Analytical	water	ng/mL	100.	5.	20.0	0.59	34.	19.1	92.	P.241	VDM/TWM

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."
as a member of the group or "block."

[b]Spike Amt. µg = the absolute microgram (µg) amount of the spike which was added to a sample.

[c]Effective Conc. = the Spike Amt (ng) divided by the sample volume (mL), units ng/mL.

[d]Unspiked Conc. = the measured concentration of the sample prior to spiking, units ng/mL.

[e]Spiked Conc. = the measured concentration of the spiked sample (spike + unspiked, units ng/mL).

[f]% Rec. = percent recovery: [(Spiked Conc. - Unspiked Conc.)/Effective Conc. * 100]

QC Table PW Metals9. Interference check for pore water by 5-fold dilution during ICP-MS quantitative analysis.

BID[a]	Run Date	Sample Used	Matrix	Element	Undiluted Sample	Diluted Sample[b]	Dil Conc X 5	Dil % Diff[c]
09/05/08	10/24/08	44121	water	Mn	36.6	7.38	36.9	0.9
09/05/08	10/24/08	44121	water	Cu	18.0	3.68	18.4	2.0
09/05/08	10/24/08	44121	water	Ni	18.0	3.57	17.9	0.5
09/05/08	10/24/08	44121	water	Zn	138.	27.6	138.	0.2
09/05/08	10/24/08	44121	water	Cd	5.44	1.07	5.36	1.5
09/05/08	10/24/08	44121	water	Pb	18.0	3.66	18.3	1.7
09/05/08	10/24/08	44123	water	Mn	37.2	7.45	37.3	0.1
09/05/08	10/24/08	44123	water	Cu	18.6	3.74	18.7	0.4
09/05/08	10/24/08	44123	water	Ni	18.6	3.77	18.9	1.3
09/05/08	10/24/08	44123	water	Zn	143.	28.5	143.	0.3
09/05/08	10/24/08	44123	water	Cd	5.54	1.10	5.48	1.1
09/05/08	10/24/08	44123	water	Pb	18.9	3.79	18.9	0.1

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]dilution factor = 5 (1+4); digestates spiked with mid-range standard prior to analysis.

[c]dilution % difference acceptance criteria = +/- 10%; concentrations exceeding +/- 10%. indicative of suspect interferent.

QC Table PW Metals 10. Blank equivalent concentrations (BEC) of Mn,Cu, Ni, Zn, Cd, and Pb for reagent blank solutions analyzed with pore-water samples.

BID[a]	Ele.	Matrix	Soln. Units	Soln 1 Conc.	Soln 2 Conc.	Soln 3 Conc.	Mean Conc.[b]	Mean BEC ng/mL	BEC SD ng/mL	PSOP	Prep. Init.	ISOP	Oper. Init.
09/05/08	Mn	water	ng/mL	0.002	0.001	0.001	0.001	0.013	0.008	---	---	P.241	VDM/TWM
09/05/08	Cu	water	ng/mL	0.007	0.008	0.003	0.006	0.062	0.029	---	---	P.241	VDM/TWM
09/05/08	Ni	water	ng/mL	0.013	0.023	- 0.004	0.011	0.11	0.14	---	---	P.241	VDM/TWM
09/05/08	Zn	water	ng/mL	0.013	- 0.024	- 0.035	- 0.015	- 0.15	0.25	---	---	P.241	VDM/TWM
09/05/08	Cd	water	ng/mL	0.000	0.000	0.000	0.000	0.0003	0.004	---	---	P.241	VDM/TWM
09/05/08	Pb	water	ng/mL	0.005	0.003	0.002	0.004	0.037	0.015	---	---	P.241	VDM/TWM

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]Mean Conc. = the mean solution concentration of the procedural blanks for a block, n = 3; units ng/mL.

[c]Sample Wgt. = weight (g) used for BEC calculation.

QC Table PW Metals11. Method detection and quantitation limits for Mn,Cu, Ni, Zn, Cd, and Pb in pore water.

BID[a]	Ele.	Matrix	W/D/L[b]	Blk SD	Standard SD	IDL[c]	MDL[d]	MQL[e]	PSOP	Prep. Init.	ISOP	Inst. Init.	Units
09/05/08	Mn	water	D	0.008	0.032	0.009	0.10	0.33	P.214	MJW	P.241	VDM/TWM	ng/mL
09/05/08	Cu	water	D	0.029	0.044	0.014	0.16	0.53	P.214	MJW	P.241	VDM/TWM	ng/mL
09/05/08	Ni	water	D	0.14	0.20	0.007	0.73	2.41	P.214	MJW	P.241	VDM/TWM	ng/mL
09/05/08	Zn	water	D	0.25	0.14	1.78	0.85	2.81	P.214	MJW	P.241	VDM/TWM	ng/mL
09/05/08	Cd	water	D	0.004	0.015	0.002	0.046	0.15	P.214	MJW	P.241	VDM/TWM	ng/mL
09/05/08	Pb	water	D	0.015	0.035	0.002	0.11	0.36	P.214	MJW	P.241	VDM/TWM	ng/mL

[a]BID = Block Initiation Date: a date assigned to each member of a group of samples that will identify the sample as a member of the group or "block."

[b]W/D/L = state of starting sample: wet (W), dry (D), or liquid (L).

[c]IDL = instrument detection limit, unit ng/mL.

[d]MDL = method limit of detection, computed as $3 \times (SD_b^2 + SD_s^2)^{1/2}$ where SD_b = standard deviation of digestion blanks (n = 3) and

SD_s = standard deviation of a low level standard diluted 100X (n = 3).

[e]MQL = 3.3 x MDL.