

Appendix 2: Bulk Sample Geochemical Analyses

The basic theory of the algorithm states:

The bulk sample geochemistry for lower concentrations is reported from the ICPMS analyses up to a specified limit for each element while higher concentrations from a specified limit are reported from the ICPAES analyses. There is a merge zone between these limits in which the results of each analysis are combined to generate the reported result. In some cases spectral interferences determine the preferred instrument to report the results from (personal communication, Shaun Crabb business development officer, (eastern region) ALS minerals division). Total results for ICPMS and ICPAES are report in table A1 and A2.

Table A1: Bulk sample geochemical results as determined by ICPMS

Sample	Ag ppm	As ppm	Au ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cs ppm	Cu ppm	Ga ppm
SM1001-0-5	8.71	204	0.109	230	1	2.95	>1.125	98	46.6	21.5	3.78	>404	15.65
SM1001-5-10	9.36	216	0.094	230	0.97	3.1	>1.180	103.5	47.2	22.6	3.88	>413	16.2
SM1001-10-15	10.45	242	0.272	230	1	3.43	>1.030	117.5	46.9	24	3.8	>472	16.9
SM1001-15-20	10.25	>256	0.096	220	1.07	3.24	>0.888	110.5	46.7	22.9	3.77	>454	15.45
SM1001-20-25	9.43	>253	0.104	230	0.96	3.12	>0.929	102.5	47	23.3	3.9	>445	16.35
SM1001-25-30	12.15	>339	0.103	220	0.95	3.85	>1.020	140.5	44.9	24.7	3.7	>549	16.05
SM1001-30-35	13.6	>387	0.124	220	1.01	4.33	>1.110	147.5	44.6	25.5	3.76	>586	16.2
SM1001-35-40	11.35	>325	0.104	200	0.86	3.71	>1.020	117.5	40.8	23.3	3.53	>517	15.2
SM1001-40-45	13.05	>419	0.107	190	0.83	4.24	>0.941	145	36.6	24.5	3.24	>575	14
SM1001-45-50	32.7	>969	0.241	240	0.86	8.15	>0.644	>292	46.7	51.9	3.95	>777	24.9
SM1001-50-55	33.5	>915	0.271	230	0.89	7.66	>0.868	>276	46.9	43.7	3.65	>785	24.9
SM1001-55-60	20.8	>717	0.158	200	0.86	3.96	>1.030	145.5	41	32.3	3.51	>610	20.5
SM1001-60-65	15.65	>452	0.188	230	1.1	2.64	>1.300	63.5	48.1	33.9	4.15	>567	20.3
SM1001-65-70	13.2	>290	0.112	240	1.18	0.93	>1.890	22.8	50.9	29.8	4.42	>354	18.35
SM1001-70-75	3.69	79.4	0.056	>260	1.2	0.42	>1.340	4.78	53.9	18.5	4.74	101	18.5
SM1001-75-80	0.39	26.1	0.047	>260	1.18	0.31	>0.996	0.97	54	17.1	4.96	42.2	18.85
SM1001-80-85	0.48	21.2	0.043	200	1.01	0.29	>3.55	0.52	46.8	15	4.1	38.4	16.25
SM1001-85-90	0.26	18.5	0.042	200	1.13	0.27	>1.075	0.37	44.1	16.4	4.1	36.9	16.2
SM1001-90-95	0.14	14.1	0.036	210	1.18	0.23	>1.145	0.14	48.2	16.6	4.38	35.5	17.75
SM1001-95-100	0.11	12.8	0.037	210	1.16	0.19	>1.165	0.17	47.4	14.6	4.3	33.1	16.1
SM1001-100-105	0.35	20.4	0.046	240	1.33	0.2	>0.879	1.86	53.7	17.1	5.1	41.6	19.65
H1-10-15	0.09	20.4	0.033	150	0.9	0.17	0.84	0.08	41	12.8	3.61	31.6	10.35

H1-20-25	0.12	23.2	0.037	180	1.1	0.21	1.04	0.1	45.7	14.8	4.06	34.7	11.6
H1-30-35	0.1	20.8	0.034	170	1.11	0.19	0.98	0.11	43.8	14.1	3.95	33.7	11.5
H1-40-45	0.12	18.2	0.031	160	0.97	0.16	0.84	0.13	42.3	13.6	3.8	26	10.5
H1-50-55	0.06	20	0.031	180	1.1	0.17	1.03	0.13	47.5	15.4	4.22	25	11.8
H1-60-65	0.06	16.7	0.031	160	0.95	0.14	1.05	0.12	42.8	12	3.83	21.1	10.25

Sample	Ge ppm	Hf ppm	Hg ppm	In ppm	La ppm	Li ppm	Mo ppm	Nb ppm	Ni ppm	Pb ppm	Rb ppm	Re ppm	Sb ppm
SM1001-0-5	0.19	2.8	6.45	7.2	21.8	31.7	3.41	8.2	38.4	>1595	61.7	0.006	21.9
SM1001-5-10	0.19	2.8	5.74	7.5	22.2	34.6	2.78	8	34.2	>1690	61.6	0.005	24.7
SM1001-10-15	0.2	2.8	7.39	8.07	21.6	34.6	3.44	8.3	35	>1880	63.1	0.006	26.7
SM1001-15-20	0.18	2.8	7.37	7.44	21.7	34.7	3.85	8.2	33.3	>1825	61.1	0.006	23.2
SM1001-20-25	0.18	2.8	6.51	7.12	21.8	34.1	3.91	7.9	34	>1750	59.4	0.006	22.6
SM1001-25-30	0.18	2.7	8.06	8.58	21.3	32	4.15	7.8	32.2	>2290	61	0.006	27.3
SM1001-30-35	0.2	2.7	9.51	9.61	20.9	33.2	5.45	7.9	31.9	>2530	60.2	0.008	31.8
SM1001-35-40	0.18	2.5	8.89	7.7	19.3	31.1	4.59	7.6	32.4	>2210	55.4	0.005	25.9
SM1001-40-45	0.17	2.1	10.85	9.01	17.1	26.8	2.64	6.1	27	>2580	46.8	0.005	31.9
SM1001-45-50	0.29	2.6	10.45	18.45	22	30.5	4.36	7.2	29.3	>6600	60.1	0.004	145.5
SM1001-50-55	0.27	2.6	10.6	20.8	21.9	28.1	3.7	7.5	28.5	>6440	57.6	0.005	132.5
SM1001-55-60	0.19	2.4	6.89	14.05	19	29.1	3.17	7.2	33.9	>3270	57	0.003	66.1
SM1001-60-65	0.2	2.9	3.81	10.5	22.3	35.4	2.52	9	33.6	>2280	71.6	0.004	52.6
SM1001-65-70	0.19	3.1	1.31	3.55	23.6	38.6	2.83	9.5	34.4	>1505	77.8	0.005	34.8
SM1001-70-75	0.19	3.3	0.28	0.407	25.4	42.6	2.65	9.9	36.9	>352	85.4	0.005	8.31
SM1001-75-80	0.2	3.2	0.11	0.149	25.3	43.9	2.3	9.5	38.5	63.8	86.2	0.004	1.33
SM1001-80-85	0.19	2.8	0.09	0.099	21.6	37.4	2.28	8.4	35.8	59.4	71.3	0.005	1.02
SM1001-85-90	0.18	2.8	0.08	0.091	21.1	43	2.89	8.4	39.8	42.7	71.2	0.005	0.72
SM1001-90-95	0.19	2.9	0.06	0.065	22.6	42.9	2.07	8.7	40.4	28.2	75.9	0.004	0.48
SM1001-95-100	0.19	2.9	0.05	0.063	22.2	40.3	1.57	8.6	37.9	26.1	74	0.004	0.42
SM1001-100-105	0.21	3.3	0.11	0.204	25.2	48.5	2.46	9.4	40.2	61.4	87.8	0.005	1.21
H1-10-15	0.42	2.6	0.03	0.035	18.6	44.4	3.48	7.4	>873	19.7	57.9	0.008	0.59
H1-20-25	0.39	2.8	0.03	0.046	20.4	53.5	5.47	8.4	>472	23.3	63.7	0.009	0.59
H1-30-35	0.25	2.7	0.03	0.046	19.6	52.3	5.57	8	>438	23	61.2	0.008	0.58
H1-40-45	0.24	2.6	0.04	0.038	19.2	46.2	5.68	7.7	>590	21.1	57.9	0.007	0.54
H1-50-55	0.26	2.9	0.03	0.042	21.6	52.3	9.34	8.5	>312	16.6	65.1	0.009	0.57
H1-60-65	0.2	2.5	0.03	0.031	19.7	45.7	4.88	7.6	>438	12.8	57.9	0.006	0.46

Sample	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm	Th ppm	Ti %	Tl ppm	U ppm	W ppm	Y ppm	Zr ppm
SM1001-0-5	17.4	3	7.8	144	0.61	0.08	6.6	>0.298	0.6	2.6	2.5	21.9	95.5
SM1001-5-10	17.6	3	7.5	139.5	0.6	0.09	6.6	>0.294	0.6	3	2.6	21.4	93.4
SM1001-10-15	17.6	3	8.1	132.5	0.59	0.08	6.7	>0.299	0.62	3.2	2.6	22.7	97.1
SM1001-15-20	17.6	3	8.1	124.5	0.58	0.09	6.7	>0.288	0.65	3.3	2.7	22	93.4
SM1001-20-25	17.6	3	7.9	123	0.56	0.08	6.5	>0.294	0.61	3.2	2.6	21.6	92.6
SM1001-25-30	16.6	4	9.5	139	0.54	0.08	6.6	>0.286	0.73	3.8	2	22.3	93
SM1001-30-35	16.4	4	9.3	149	0.56	0.09	6.6	>0.270	0.73	3.4	2	22.5	93
SM1001-35-40	15.1	4	7.9	141	0.51	0.08	6	>0.256	0.65	2.7	2.6	20.5	84.8
SM1001-40-45	13.4	3	7.8	122	0.45	0.07	5.3	>0.226	0.66	2.5	2.1	17	71.1
SM1001-45-50	15.5	5	10.3	97.1	0.55	0.1	6.9	>0.240	0.68	3	3.4	19.6	86
SM1001-50-55	14.8	5	9.9	117.5	0.56	0.1	6.9	>0.251	0.84	2.8	3.3	20.1	88.1
SM1001-55-60	15.7	3	7.6	115.5	0.5	0.1	5.8	>0.269	0.58	2.3	2.4	18.8	82.2
SM1001-60-65	18.6	3	6.9	142.5	0.61	0.1	6.7	>0.338	0.45	2.3	1.9	21.8	103.5
SM1001-65-70	19.9	3	5.7	152	0.68	0.13	7.1	>0.365	0.4	2.5	1.8	22.3	106.5
SM1001-70-75	21.8	2	4.4	145	0.71	0.11	7.7	>0.395	0.41	2.5	1.6	23.2	113.5
SM1001-75-80	22.6	2	4.1	123	0.7	0.11	7.4	>0.382	0.42	2.3	1.5	22	109
SM1001-80-85	20.1	2	4	>262	0.6	0.12	6.3	>0.336	0.34	2.2	1.4	20.2	97.2
SM1001-85-90	22	2	3.5	117	0.58	0.1	6.6	>0.354	0.35	2.2	1.4	19.8	98.6
SM1001-90-95	22.4	2	3.6	122	0.61	0.1	6.7	>0.362	0.35	2.1	1.5	20.6	101.5
SM1001-95-100	21.2	2	3.3	123.5	0.59	0.07	6.6	>0.341	0.34	2.1	1.5	20.3	101.5
SM1001-100-105	24.5	2	3.3	117.5	0.67	0.06	7.6	>0.385	0.42	2.5	1.3	23.4	112
H1-10-15	13.6	11	2	101.5	0.5	0.11	5.7	0.31	0.32	4	1.3	14.6	89.2
H1-20-25	15.7	7	2.3	118.5	0.57	0.07	6.3	0.37	0.37	4.2	1.4	15.8	98.6
H1-30-35	15.2	5	2.1	114.5	0.57	0.05	6	0.35	0.35	4	1.3	14.7	95.1
H1-40-45	13.4	3	2	99	0.52	0.08	5.6	0.34	0.32	3.3	1.2	14	90.1
H1-50-55	14.8	2	1.8	115.5	0.57	0.08	6.2	0.37	0.39	4.2	1.2	16.2	100.5
H1-60-65	13	2	1.5	110	0.51	0.05	5.7	0.32	0.34	2.8	1.1	14.4	89.7

Table A2: Bulk sample geochemical results as determined by ICPAES

Sample	Ag ppm	Al %	As ppm	B ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cu ppm
SM1001-0-5	9.6	6.3	226	<10	200	1.2	6	1.15	99.7	50	24	177	481
SM1001-5-10	10.5	6.47	240	<10	210	1.3	5	1.23	108	<50	25	188	495
SM1001-10-15	11.2	6.32	259	<10	210	1.2	7	1.05	118	<50	27	198	544
SM1001-15-20	11.5	6.45	284	<10	210	1.3	7	0.97	115	50	26	217	550
SM1001-20-25	10.6	6.25	273	<10	210	1.3	5	0.98	106	<50	26	205	521
SM1001-25-30	14	6.23	376	<10	210	1.3	6	1.11	147.5	<50	29	192	674
SM1001-30-35	15.1	6.14	428	<10	210	1.2	8	1.17	151.5	<50	29	183	720
SM1001-35-40	12.7	5.76	340	<10	190	1.1	8	1.14	125.5	<50	25	263	575
SM1001-40-45	14.1	4.68	425	<10	170	1	8	0.94	145	<50	25	126	631
SM1001-45-50	37.2	6.17	1100	<10	200	1.2	13	0.73	300	<50	62	132	951
SM1001-50-55	37	5.8	1010	<10	190	1.1	13	0.95	274	<50	51	115	945
SM1001-55-60	21.5	5.36	749	<10	170	1.1	7	1.03	140	<50	33	173	678
SM1001-60-65	16.7	6.63	476	<10	210	1.3	5	1.34	63.4	50	35	138	627
SM1001-65-70	14.3	7.09	309	<10	220	1.4	3	1.86	22.3	50	32	137	415
SM1001-70-75	4.4	7.47	78	<10	230	1.4	2	1.32	4.6	50	19	133	109
SM1001-75-80	0.6	7.57	25	<10	230	1.3	2	0.98	1	50	16	121	43
SM1001-80-85	0.7	6.85	23	<10	190	1.2	2	3.54	0.7	50	15	137	42
SM1001-85-90	<0.5	7.08	19	<10	190	1.3	<2	1.04	<0.5	50	17	144	40
SM1001-90-95	<0.5	7.07	16	<10	190	1.3	2	1.09	<0.5	50	18	143	37
SM1001-95-100	<0.5	6.36	12	<10	180	1.2	3	1.04	<0.5	<50	15	149	32
SM1001-100-105	0.5	7.91	21	<10	210	1.5	<2	0.86	1.8	50	17	109	44
H1-10-15	<0.5	4.37	13	<10	150	0.8	<2	0.8	<0.5	<50	10	220	31
H1-20-25	<0.5	4.96	14	<10	170	0.9	<2	0.94	<0.5	<50	12	170	33
H1-30-35	<0.5	4.65	16	<10	160	0.9	<2	0.89	<0.5	<50	11	156	32
H1-40-45	<0.5	4.26	13	<10	150	0.8	<2	0.76	<0.5	<50	11	170	24
H1-50-55	<0.5	4.74	16	<10	170	0.9	<2	0.93	<0.5	<50	13	128	23
H1-60-65	<0.5	4.23	11	<10	150	0.8	<2	0.96	<0.5	<50	10	143	20

Sample	Fe %	Ga ppm	Hf ppm	Hg ppm	In ppm	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Nb ppm
SM1001-0-5	5.93	10	<10	10	<10	1.03	20	30	1.11	780	4	4.13	10
SM1001-5-10	6.06	20	<10	10	<10	1.06	20	30	1.12	864	3	3.97	10
SM1001-10-15	5.86	20	<10	10	10	1.03	20	30	1.08	863	4	3.79	10
SM1001-15-20	5.93	10	<10	10	10	1.04	20	30	1.06	767	4	3.8	10
SM1001-20-25	5.78	10	<10	10	<10	1.03	20	30	1.05	749	4	3.66	10
SM1001-25-30	6.16	20	<10	10	10	1.05	20	30	1.16	858	5	4.15	10
SM1001-30-35	6.48	20	<10	10	10	1.05	20	30	1.24	874	5	4.54	10
SM1001-35-40	6.11	20	<10	10	<10	0.93	20	30	1.18	864	5	4.42	10
SM1001-40-45	5.24	10	<10	10	<10	0.81	10	20	0.99	972	2	3.6	<10
SM1001-45-50	11	20	<10	10	10	1.02	20	30	1.01	4060	4	3.42	<10
SM1001-50-55	10.1	20	<10	10	20	0.99	20	30	1.08	3850	4	3.56	10
SM1001-55-60	6.42	20	<10	10	10	0.93	10	20	0.96	1780	3	2.83	10
SM1001-60-65	5.93	20	<10	<10	10	1.15	20	30	1.13	1160	2	3.22	10
SM1001-65-70	5.35	20	<10	<10	<10	1.25	20	40	1.07	740	3	2.88	10
SM1001-70-75	4.96	20	<10	<10	<10	1.31	20	40	1.05	462	3	2.88	10
SM1001-75-80	4.86	20	<10	<10	<10	1.24	20	40	1.03	331	2	2.8	10
SM1001-80-85	4.35	20	<10	<10	<10	1.15	20	30	0.98	265	2	2.85	10
SM1001-85-90	4.69	20	<10	<10	<10	1.15	20	40	0.99	218	3	2.73	10
SM1001-90-95	4.57	20	<10	<10	<10	1.21	20	40	0.97	205	2	2.46	10
SM1001-95-100	4.17	10	<10	<10	<10	1.06	20	40	0.88	197	2	2.19	10
SM1001-100-105	5.01	20	<10	<10	<10	1.29	20	50	1.03	226	2	2.53	10
H1-10-15	3.18	10	<10	<10	<10	1.02	20	10	0.92	128	3	2.59	<10
H1-20-25	3.58	10	<10	<10	<10	1.19	20	20	1.13	168	5	3.34	10
H1-30-35	3.58	10	<10	<10	<10	1.15	20	30	1.07	163	5	3.09	<10
H1-40-45	3.23	10	<10	<10	<10	1.04	20	30	0.93	177	5	2.43	10
H1-50-55	3.47	10	<10	<10	<10	1.16	20	30	1	235	8	2.54	10
H1-60-65	3.12	10	<10	<10	<10	1.04	20	30	0.92	163	4	2.39	10

Sample	Ni ppm	P ppm	Pb ppm	Rb ppm	S %	Sb ppm	Sc ppm	Se ppm	Si ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm
SM1001-0-5	41	1360	1700	60	2	22	20	<10	<10	10	136	<10	<10
SM1001-5-10	40	1320	1840	60	2.04	27	20	<10	170	10	139	<10	<10
SM1001-10-15	39	1190	2010	60	2.14	25	20	<10	410	10	123	<10	<10
SM1001-15-20	39	1150	1990	60	2.4	24	20	<10	600	10	121	<10	<10
SM1001-20-25	37	1140	1910	60	2.36	26	20	<10	720	10	123	<10	<10
SM1001-25-30	37	1060	2490	60	3.23	26	20	<10	900	10	135	<10	<10
SM1001-30-35	36	1000	2750	60	4.3	31	20	<10	1030	10	141	<10	<10
SM1001-35-40	35	930	2380	50	3.92	29	20	<10	1030	10	135	<10	<10
SM1001-40-45	29	810	2680	50	3.45	31	10	<10	900	10	117	<10	<10
SM1001-45-50	35	740	6980	60	3.31	147	20	<10	1230	10	98	<10	<10
SM1001-50-55	33	750	6680	50	3.33	137	20	<10	1440	10	113	<10	<10
SM1001-55-60	36	630	3420	50	3.25	61	20	<10	1320	10	105	<10	<10
SM1001-60-65	36	680	2470	70	3.31	53	20	<10	1490	10	129	<10	<10
SM1001-65-70	37	620	1590	70	2.97	34	20	<10	1480	<10	147	<10	<10
SM1001-70-75	39	570	363	70	2.27	7	20	<10	1650	<10	138	<10	<10
SM1001-75-80	39	570	68	80	2.15	<5	20	<10	1970	<10	120	<10	<10
SM1001-80-85	38	640	63	70	2.07	<5	20	<10	2060	<10	262	<10	<10
SM1001-85-90	43	590	44	70	2.2	<5	20	<10	2030	<10	116	<10	<10
SM1001-90-95	42	580	29	70	2.01	<5	20	<10	1860	<10	118	<10	<10
SM1001-95-100	38	520	25	60	1.84	<5	20	<10	1700	<10	111	<10	<10
SM1001-100-105	42	600	63	80	2.15	<5	20	<10	1900	<10	110	<10	<10
H1-10-15	800	610	19	50	1.06	<5	10	<10	80	<10	94	<10	<10
H1-20-25	418	540	23	60	2.02	<5	10	<10	190	<10	114	<10	<10
H1-30-35	391	530	22	60	1.96	<5	10	<10	220	<10	110	<10	<10
H1-40-45	523	410	21	50	2.25	<5	10	<10	320	<10	95	<10	<10
H1-50-55	274	480	15	70	2.6	<5	10	10	390	<10	106	<10	<10
H1-60-65	395	450	11	50	2.45	<5	10	<10	330	<10	102	<10	<10

	Th	Ti	Tl	U	V	W	Y	Zn	Zr
Sample	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
SM1001-0-5	<20	0.35	<10	<10	104	<10	20	>10150	94
SM1001-5-10	<20	0.358	<10	<10	106	<10	20	>11250	95
SM1001-10-15	<20	0.352	<10	<10	108	<10	20	>12200	93
SM1001-15-20	<20	0.361	<10	<10	109	<10	20	>11800	96
SM1001-20-25	<20	0.35	<10	<10	108	<10	20	>10950	94
SM1001-25-30	<20	0.353	<10	<10	106	<10	20	>14750	94
SM1001-30-35	<20	0.34	<10	<10	106	<10	20	>15500	92
SM1001-35-40	<20	0.305	<10	<10	95	<10	20	>12300	81
SM1001-40-45	<20	0.258	<10	<10	83	<10	20	>14800	70
SM1001-45-50	<20	0.307	<10	<10	126	10	20	>43200	86
SM1001-50-55	<20	0.315	<10	<10	118	10	20	>39900	85
SM1001-55-60	<20	0.306	<10	<10	101	<10	20	>19550	79
SM1001-60-65	<20	0.395	<10	<10	115	<10	20	>10100	98
SM1001-65-70	<20	0.428	<10	<10	113	<10	20	5540	105
SM1001-70-75	<20	0.435	<10	<10	116	<10	20	1470	108
SM1001-75-80	<20	0.4	<10	<10	111	<10	20	246	100
SM1001-80-85	<20	0.384	<10	<10	105	<10	20	208	97
SM1001-85-90	<20	0.392	<10	<10	111	<10	20	142	99
SM1001-90-95	<20	0.408	<10	<10	114	<10	20	93	104
SM1001-95-100	<20	0.358	<10	<10	95	<10	20	80	91
SM1001-100-105	<20	0.42	<10	<10	118	<10	20	333	108
H1-10-15	<20	0.267	<10	10	88	<10	10	59	88
H1-20-25	<20	0.295	<10	10	93	<10	20	72	99
H1-30-35	<20	0.289	<10	10	94	<10	10	69	93
H1-40-45	<20	0.278	<10	10	82	<10	10	57	93
H1-50-55	<20	0.302	<10	<10	90	<10	20	56	97
H1-60-65	<20	0.267	<10	10	79	<10	10	47	89

Final analyses for Zn analyses that are above detection limits are reported in (Gregory et al., 2013)

REFERENCES

Gregory, D., Meffre, S., and Large, R. (2013) Mineralogy of metal contaminated estuarine sediments, Derwent estuary, Hobart, Australia: implications for metal mobility. Australian Journal of Earth Sciences(ahead-of-print), 1-15.