

**Table S1: Geo-Accumulation Index (Igeo) and associated contamination levels of study area**

Profile No.	Depth (cm)	Igeo						C. level					
		As	Co	Cu	Ni	V	Zn	As	Co	Cu	Ni	V	Zn
1	0-30	-0.5	-2.9	-5.8	-4.0	-6.1	-5.9	U	U	U	U	U	U
	30-50	-2.3	-3.0	-6.3	-4.3	-6.3	-9.2	U	U	U	U	U	U
	50-80	-5.2	-3.6	-6.3	-4.6	-6.2	-12.5	U	U	U	U	U	U
	80-110	-7.2	-3.4	-6.3	-5.4	-6.3	-10.2	U	U	U	U	U	U
2	0-20	3.6	1.1	1.5	1.7	1.9	2.2	S	M	M	M	M	M-S
	20-50	3.5	-0.4	1.3	1.1	1.7	1.3	S	U	M	M	M	M
	50-80	3.4	0.0	1.0	0.5	1.7	-0.1	H	U	U-M	M	M	N
3	0-40	-0.6	-3.0	-5.7	-4.3	-5.5	-3.7	U	U	U	U	U	U
	40-70	-0.5	-3.3	-5.6	-5.0	-5.6	-3.0	U	U	U	U	U	U
	70-100	-5.1	-3.5	-5.9	-5.0	-5.7	-9.2	U	U	U	U	U	U
	100-130	-5.6	-3.6	-6.0	-9.7	-5.7	-10.2	U	U	U	U	U	U
4	0-30	5.3	0.7	1.2	1.6	1.0	2.4	E	U-M	U-M	M	M	M-S
	30-50	4.0	0.1	1.2	1.3	0.9	0.8	S-E	U-M	M	M	U-M	U-M
	50-80	2.9	0.0	1.0	1.2	0.8	-4.1	M-S	U	M	U-M	U-M	U
	80-110	2.9	-0.1	1.0	0.6	0.8	-4.8	M-S	U	M	U-M	U-M	U
	110-150	2.3	-1.0	0.7	0.5	0.7	-5.1	M-S	U	U-M	U-M	U-M	U
5	0-40	-1.6	-2.8	-4.4	-3.8	-5.2	-4.5	U	U	U	U	U	U
	40-70	-5.4	-3.2	-5.1	-5.4	-5.8	-5.5	U	U	U	U	U	U
	70-110	-6.2	-4.1	-6.3	-5.6	-5.8	-10.0	U	U	U	U	U	U
6	0-35	5.0	0.9	1.6	1.8	1.3	1.6	E	U-M	M	M	M	M
	35-65	4.6	0.2	1.3	1.7	1.2	1.5	S-E	U-M	M	M	M	M
	65-80	4.0	-0.5	1.2	1.7	1.1	0.5	S-E	U-M	M	M	M	U-M
	80-150	3.0	-0.7	1.2	1.4	1.1	-0.6	S	U	M	M	M	U
7	0-40	3.2	1.0	1.3	2.3	1.7	1.8	S	M	M	M-S	M	M
	40-70	2.9	0.5	1.2	2.0	1.7	1.5	M-S	U-M	M	M	M	M
	70-90	2.7	0.4	1.1	1.8	1.6	1.0	M-S	U-M	M	M	M	U-M
	90-150	1.3	-0.4	0.9	1.3	1.2	-0.4	M	U	U	U	M	U

Profile No.	Depth (cm)	Igeo						C. level					
		As	Co	Cu	Ni	V	Zn	As	Co	Cu	Ni	V	Zn
8	0-20	3.4	0.7	1.5	2.0	2.3	2.3	S	U-M	M	M	M-S	M-S
	20-50	1.3	0.3	1.3	1.9	2.1	1.4	M	U-M	M	M	M-S	M
	50-80	-1.7	0.0	1.3	1.7	2.1	1.2	U	U	M	M	M-S	M
	80-110	-1.9	-0.8	0.9	1.5	1.7	-1.9	U	U	U-M	M	M	U
9	0-40	3.7	1.1	1.9	2.4	2.1	1.5	S	M	M	M-S	M-S	M
	40-75	2.7	0.9	1.4	1.8	1.9	1.0	M-S	U-M	M	M	M	U-M
	75-100	2.3	0.9	1.0	0.8	1.4	0.9	M-S	U-M	U-M	U-M	M	U-M
	100-150	2.2	0.7	0.4	0.7	1.3	0.4	M-S	U-M	U-M	U-M	M	U-M
10	0-30	3.3	0.4	1.8	2.0	1.6	2.3	S	U-M	M	M	M	M-S
	30-65	3.1	0.2	1.5	1.7	0.9	2.3	S	U-M	M	M	U-M	M-S
	65-100	3.2	0.0	1.2	1.5	0.8	-2.5	S	U	M	M	U-M	U
	100-150	2.7	-0.2	1.0	1.2	0.7	-4.2	M-S	U	U-M	M	U-M	U
11	0-30	3.5	1.8	1.4	2.8	2.2	2.0	S	M	M	M	M-S	M
	30-60	2.1	1.2	1.3	2.5	1.9	1.1	M-S	M	M	M-S	M	M
	60-80	1.5	0.9	1.3	2.0	1.9	1.0	M	U-M	M	M	M	U-M
	80-110	0.3	0.8	1.3	1.0	1.7	-4.0	U-M	U-M	M	U-M	M	N
12	0-30	3.6	0.8	1.5	2.5	2.0	1.9	S	U-M	M	M-S	M	M
	30-60	3.2	0.6	1.4	2.4	2.0	1.9	S	U-M	M	M-S	M	M
	60-90	1.6	0.6	1.3	2.1	2.0	-3.3	M	U-M	M	M-S	M	U
	90-120	-0.3	0.6	1.1	1.4	1.9	-4.1	U	L	M	M	M	U
	120-150	-2.5	0.0	0.9	1.3	1.8	-4.3	U	U	L	U-M	M	N
13	0-40	4.7	0.3	1.7	2.6	2.1	2.3	S-E	U-M	M	M-S	M-S	M-S
	40-60	4.3	0.1	1.6	2.5	2.1	2.2	S-E	U-M	M	M-S	M-S	M-S
	60-80	3.7	-0.8	1.3	2.1	1.8	2.2	S	U	M	M-S	M	M-S
	80-110	1.6	-1.5	1.3	1.7	1.8	2.0	M	U	M	M	M	M
	110-150	-1.9	-3.8	1.1	1.2	1.6	2.0	U	U	M	M	M	M
14	0-10	-2.5	-2.3	-6.0	-4.3	-5.5	-2.9	U	U	U	U	U	U
	10-30	-5.1	-2.5	-6.1	-4.3	-5.7	-3.6	U	U	U	U	U	U
	30-60	-5.4	-2.8	-6.2	-5.0	-6.2	-10.7	U	U	U	U	U	U

	Depth	Igeo						C. level					
		As	Co	Cu	Ni	V	Zn	As	Co	Cu	Ni	V	Zn
	<b>60-80</b>	-8.2	-2.7	-6.4	-4.6	-6.3	-10.5	U	U	U	U	U	U
<b>15</b>	<b>0-40</b>	4.5	-2.9	1.4	1.9	1.2	2.0	S-E	U	M	M	M	M
	<b>40-70</b>	4.3	-0.1	1.2	1.8	1.2	2.0	S-E	U	M	M	M	M
	<b>70-100</b>	3.7	-0.3	1.1	1.1	1.0	1.8	S	U	M	M	U-M	M
	<b>100-150</b>	3.2	0.9	1.0	0.2	1.0	-0.8	S	U-M	U-M	M	U-M	N

Notes: U= Uncontaminated, U-M= Uncontaminated to moderately contaminated, M= Moderately contaminated, M-S= Moderately contaminated to Strongly, S= Strongly, S-E= Strongly to Extremely, E= Extremely.

**Table S2: Contamination factor (CF) and associated contamination levels of study area**

Profile No.	Depth (cm)	CF						C. level					
		As	Co	Cu	Ni	V	Zn	As	Co	Cu	Ni	V	Zn
<b>1</b>	<b>0-30</b>	1.09	0.20	0.03	0.10	0.02	0.03	M	L	L	L	L	L
	<b>30-50</b>	0.32	0.19	0.02	0.08	0.02	0.00	L	L	L	L	L	L
	<b>50-80</b>	0.04	0.12	0.02	0.06	0.02	0.00	L	L	L	L	L	L
	<b>80-110</b>	0.01	0.15	0.02	0.03	0.02	0.00	L	L	L	L	L	L
<b>2</b>	<b>0-20</b>	18.38	3.15	4.20	4.80	5.64	6.97	VH	C	C	C	C	VH
	<b>20-50</b>	16.65	1.18	3.69	3.30	5.01	3.74	VH	M	C	C	C	C
	<b>50-80</b>	16.01	1.54	3.04	2.16	4.86	1.37	VH	M	C	M	C	M
<b>3</b>	<b>0-40</b>	1.02	0.19	0.03	0.08	0.03	0.12	M	L	L	L	L	L
	<b>40-70</b>	1.09	0.15	0.03	0.05	0.03	0.19	M	L	L	L	L	L
	<b>70-100</b>	0.05	0.13	0.03	0.05	0.03	0.00	L	L	L	L	L	L
	<b>100-130</b>	0.03	0.13	0.02	0.00	0.03	0.00	L	L	L	L	L	L
<b>4</b>	<b>0-30</b>	60.60	2.40	3.52	4.47	3.09	7.68	VH	M	C	C	C	VH
	<b>30-50</b>	23.63	1.60	3.40	3.72	2.78	2.55	VH	M	C	C	M	M
	<b>50-80</b>	11.50	1.51	2.94	3.36	2.65	0.09	VH	M	M	C	M	L
	<b>80-110</b>	11.10	1.38	2.92	2.31	2.64	0.05	VH	M	M	M	M	L
	<b>110-150</b>	7.28	0.76	2.49	2.13	2.51	0.04	VH	L	M	M	M	L
<b>5</b>	<b>0-40</b>	0.51	0.22	0.07	0.11	0.04	0.07	L	L	L	L	L	L
	<b>40-70</b>	0.04	0.16	0.04	0.04	0.03	0.03	L	L	L	L	L	L
	<b>70-110</b>	0.02	0.09	0.02	0.03	0.03	0.00	L	L	L	L	L	L
<b>6</b>	<b>0-35</b>	47.26	2.76	4.45	5.37	3.72	4.40	VH	M	C	C	C	C
	<b>35-65</b>	35.87	1.76	3.58	4.86	3.41	4.26	VH	M	C	C	C	C
	<b>65-80</b>	23.70	1.09	3.49	4.71	3.27	2.12	VH	M	C	C	C	M
	<b>80-150</b>	12.15	0.94	3.42	3.96	3.13	0.98	VH	L	C	C	C	L
<b>7</b>	<b>0-40</b>	13.32	3.00	3.74	7.14	4.83	5.26	VH	C	C	VH	C	C
	<b>40-70</b>	10.86	2.14	3.53	5.88	4.74	4.26	VH	M	C	C	C	C
	<b>70-90</b>	9.69	1.91	3.29	5.07	4.45	2.98	VH	M	C	C	C	M
	<b>90-150</b>	3.79	1.18	2.83	3.78	3.43	1.12	C	M	M	C	C	M

Profile No.	Depth (cm)	CF						C. level					
		As	Co	Cu	Ni	V	Zn	As	Co	Cu	Ni	V	Zn
8	0-20	15.37	2.44	4.22	6.12	7.12	7.39	VH	M	C	VH	VH	VH
	20-50	3.79	1.87	3.65	5.64	6.20	3.97	C	M	C	C	VH	C
	50-80	0.47	1.49	3.58	4.92	6.30	3.55	L	M	C	C	VH	C
	80-110	0.41	0.89	2.88	4.29	4.78	0.41	L	L	M	C	C	L
9	0-40	19.87	3.15	5.65	7.62	6.48	4.26	VH	C	C	VH	VH	C
	40-75	10.01	2.80	4.03	5.07	5.46	2.98	VH	M	C	C	C	M
	75-100	7.53	2.80	3.00	2.58	3.99	2.83	VH	M	C	M	C	M
	100-150	6.88	2.51	1.99	2.37	3.65	1.98	VH	M	M	M	C	M
10	0-30	14.72	2.02	5.11	5.85	4.58	7.54	VH	M	C	C	C	VH
	30-65	12.79	1.67	4.34	4.83	2.84	7.39	VH	M	C	C	M	VH
	65-100	13.44	1.51	3.47	4.23	2.64	0.27	VH	M	M	C	M	L
	100-150	10.03	1.27	3.04	3.51	2.36	0.08	VH	M	M	C	M	L
11	0-30	16.65	5.17	3.90	10.51	6.74	6.18	VH	C	C	VH	VH	VH
	30-60	6.27	3.47	3.80	8.22	5.77	3.26	VH	C	C	VH	C	C
	60-80	4.33	2.74	3.72	5.85	5.60	2.98	C	M	C	C	C	M
	80-110	1.86	2.62	3.71	3.09	4.84	0.09	M	M	C	C	C	L
12	0-30	18.58	2.69	4.13	8.38	5.80	5.76	VH	M	C	VH	C	C
	30-60	14.08	2.29	4.06	7.71	5.93	5.61	VH	M	C	VH	C	C
	60-90	4.43	2.33	3.57	6.45	5.81	0.15	C	M	C	VH	C	L
	90-120	1.21	2.22	3.13	3.99	5.39	0.09	M	M	C	C	C	L
	120-150	0.26	1.53	2.83	3.72	5.16	0.08	L	M	M	C	C	L
13	0-40	38.53	1.87	4.90	9.31	6.43	7.25	VH	M	C	VH	VH	VH
	40-60	29.52	1.58	4.44	8.38	6.38	6.97	VH	M	C	VH	VH	VH
	60-80	19.87	0.85	3.76	6.39	5.06	6.75	VH	L	C	VH	C	VH
	80-110	4.43	0.54	3.71	4.83	5.19	6.00	C	L	C	C	C	VH
	110-150	0.41	0.11	3.30	3.45	4.58	5.83	L	L	C	C	C	C
14	0-10	0.26	0.30	0.02	0.08	0.03	0.20	L	L	L	L	L	L
	10-30	0.05	0.27	0.02	0.08	0.03	0.13	L	L	L	L	L	L
	30-60	0.04	0.21	0.02	0.05	0.02	0.00	L	L	L	L	L	L

	Depth	CF						C. level					
		As	Co	Cu	Ni	V	Zn	As	Co	Cu	Ni	V	Zn
	<b>60-80</b>	0.01	0.23	0.02	0.06	0.02	0.00	L	L	L	L	L	L
<b>15</b>	<b>0-40</b>	33.38	0.20	3.83	5.64	3.54	5.97	VH	L	C	C	C	C
	<b>40-70</b>	28.88	1.40	3.49	5.37	3.34	5.83	VH	M	C	C	C	C
	<b>70-100</b>	19.68	1.23	3.15	3.30	3.09	5.26	VH	M	C	C	C	C
	<b>100-150</b>	13.44	2.71	2.93	1.74	3.02	0.84	VH	M	M	M	C	L

Notes: L= Low contamination, M= Moderate contamination, C= Considerable contamination, VH= Very High contamination.