Table S1. List of Analytical Method Quality Parameters.

Item	Elements	Method, Instrument Model	Detection Limit
Soil	pH	pH	-
	As	AFS	0. 01 mg•kg^{-1}
	Hg		0.002 mg•kg^{-1}
	Cr	AAS	2 mg•kg^{-1}
	Cd		0.01 mg•kg^{-1}
	Cu	ICP-MS	1.2 mg•kg^{-1}
	Ni		1.9 mg•kg^{-1}
	Pb		2.1 mg•kg^{-1}
Water	pH	pH, PHS-3E	-
	As	AFS, XGY-1011A	0.3 μg•L^{-1}
	Cd	ICP-MS, ICAP RQ	0.05 μg•L^{-1}
	Cr	Visible spectrophotometer, T6	0.004 mg•L^{-1}
	Cu	ICP-MS, ICAP RQ	0.08 μg•L^{-1}
	Pb		0.09 μg•L^{-1}
	Hg	AFS, XGY-1011A	0.04 μg•L^{-1}
	Ni	ICP-MS, ICAP RQ	0.06 μg•L^{-1}

The calculations for the single-factor pollution index and the Nemerow pollution index are shown in Formula (1) and (2), respectively.

$$P_i = C_i / S_i \quad (1)$$

where P_i is the pollution index of a single heavy metal(loid) i; C_i is the concentration of heavy metal(loid)s (mg•kg^{-1}); and S_i is the evaluation standard of heavy metal(loid)s (mg•kg^{-1}) in soil. In this study, GB 36600–2018 was adopted as the evaluation standard, and specified risk screening values are outlined in Table S2.

Table S2. Risk screening values for soil contamination of Construction land (mg•kg^{-1}).

	As	Hg	Cd	Cu	Ni	Pb
Screening values	60	38	65	18000	900	800
Control values	140	82	172	36000	2000	2500

$$P_N = \sqrt{\frac{P_{ave}^2 + P_{max}^2}{2}} \quad (2)$$

where P_N is the Nemerow pollution index of heavy metal(loid)s in soil; P_{ave} is the average value of the single factor index; P_{max} is the maximum value of the single factor pollution index. The classification criteria for the assessment of soil heavy metal(loid) pollution are presented in Table S3.

Table S3. Classification criteria for the assessment of soil heavy metal(loid) pollution assessment.

Level	Nemerow Index	Degree of Pollution
1	$P_N \leq 0.7$	Uncontaminated
2	$0.7 < P_N \leq 1.0$	Warning Level of Caution
3	$1.0 < P_N \leq 2.0$	Low pollution
4	$2.0 < P_N \leq 3.0$	Moderate pollution
5	$P_N > 3.0$	High pollution

The average exposure dose for each pathway ($ADDing$, ADD_{inh} and $ADDderm$) can be calculated using Formulas (3), (4) and (5).

$$ADD_{ing} = C_i \times (R_{ing} \times EF \times ED/BW \times AT) \quad (3)$$

$$ADD_{inh} = C_i \times (R_{inh} \times EF \times ED/PEF \times BW \times AT) \quad (4)$$

$$ADD_{derm} = C_i \times (SA \times SL \times ABF \times EF \times ED/BW \times AT) \quad (5)$$

where the main symbols used in the formulas are explained in Table S4.

Table S4. Parameter values of health risk assessment model.

Parameter	Child	Adult	Reference
R_{ing}（$mg \cdot d^{-1}$）	200	100	[48]
EF($d \cdot a^{-1}$)	350	350	
ED（a）	6	24	
BW(kg)	15.9	56.8	
AT(d)	25550（Carcinogenic） 2190（non-carcinogenic）	25550(Carcinogenic) 8760（non-carcinogenic）	
Rinh($m^3 \cdot d^{-1}$)	7.5	14.5	
PEF($m^3 \cdot kg^{-1}$)	1.36×10^9	1.36×10^9	
SL($mg \cdot (cm^2 \bullet d)^{-1}$)	0.2	0.07	
SA（cm^2）	2800	5700	
ABF（zero dimension）	0.01（Carcinogenic） 0.001（non-carcinogenic）	0.01（Carcinogenic） 0.001（non-carcinogenic）	

The non-carcinogenic risk for each heavy metal(loid) and the total index (HI) is the sum of HQ of heavy metal(loid)s, calculated by Formulas (6) and (7), respectively.

$$HQ = ADD/RfD \quad (6)$$

$$HI = \sum HQ \quad (7)$$

where RfD represents the non-carcinogenic average daily reference dose for heavy metal(loid)s i in ($mg \cdot (kg \cdot d)^{-1}$), k means different pathways of exposure.

The carcinogenic risk for each heavy metal(loid) (CR) and the total carcinogenic risk (TCR) can be estimated using Formulas (8) and (9), respectively.

$$CR = ADD \times SF \quad (8)$$

$$TCR = \sum CR \quad (9)$$

where SF is the carcinogenicity slope factor in ($(kg \cdot d) \cdot mg^{-1}$), specific reference value in-Table S5.

Table S5. Reference dose (RfD) and slope factor (SF) of different exposure routes.

HMs	RfD/(mg·(kg·d)$^{-1}$)			SF/((kg·d)·mg^{-1})			Reference
	Oral Ingestion	Respiratory Inhalation	Skin Exposure	Oral Ingestion	Respiratory Inhalation	Skin Exposure	
Cu	4.00×10^{-2}	4.02×10^{-2}	1.20×10^{-2}	-	-	-	[93]
Ni	2.00×10^{-2}	2.06×10^{-2}	5.40×10^{-3}	1.70	0.84	42.50	
Pb	3.50×10^{-3}	3.52×10^{-3}	5.25×10^{-4}	8.5×10^{-3}	4.2×10^{-2}	1.7×10^{-2}	
Cd	1.00×10^{-3}	1.00×10^{-5}	1.00×10^{-5}	6.10	6.30	6.10	
As	3.00×10^{-4}	1.23×10^{-4}	1.23×10^{-4}	1.50	15.10	3.66	
Hg	3.00×10^{-4}	8.57×10^{-5}	2.10×10^{-5}	3.00×10^{-4}	3.00×10^{-4}	3.00×10^{-7}	[94]