

Table S1. The classes of pollution and potential ecological risk

| Pollution assessment | | | |
|---|---|--|---|
| Index | Formula | Classes of contamination | Contamination Degree |
| Contamination factor (CF) [34] | $CF_i = \frac{C_i}{B_i}$ | $CF_i < 1$ $1 \leq CF_i < 3$ $3 \leq CF_i < 6$ $CF_i \geq 6$ | Low Moderate Considerable Very high |
| Pollution load index (PLI) [35] | $PLI = \sqrt[n]{\prod_{i=1}^n CF_i}$ | $PLI < 1$ $PLI > 1$ | Unpolluted Polluted |
| Nemerow multi-factor index (PI) [36] | $PI = \sqrt{\frac{(CF_{i\max})^2 + (CF_{i\text{ave}})^2}{2}}$ | $PI < 1$ $1 \leq PI < 2.5$ $2.5 \leq PI < 7$ $PI \geq 7$ | Unpolluted Lowly polluted Moderately polluted Highly polluted [37] |
| Ecological risk assessment | | | |
| Index | Formula | Classes of risk | Potential ecological risk |
| Potential ecological risk index of the single metal (ER) [38] | $ER_i = TR_i \cdot \frac{C_i}{B_i}$ | $ER_i < 40$ $40 \leq ER_i < 80$ $80 \leq ER_i < 160$ $160 \leq ER_i < 320$ $ER_i \geq 320$ | Low Moderate Considerable High Very high |
| Potential ecological risk index (PERI) [38] | $PERI = \sum_{i=1}^n ER_i$ | $PERI < 150$ $150 \leq PERI < 300$ $300 \leq PERI < 600$ $PERI \geq 600$ | Low Moderate High Very high |

Symbols description: C_i is the measured concentration of metal i , B_i is the geochemical background value of metal i , n is the number of heavy metals, $CF_{i\max}$ is the maximum contamination factor, $CF_{i\text{ave}}$ is the average contamination factor ER_i is the potential ecological risk index of the metal i , TR_i is the toxic response factor for metal i (Cd = 30, Zn = 1, Cr = 2, Ni=Cu=Pb=5).