

Supplementary Material Figure S1 - Correlation matrices for pXRF and pSpec data.

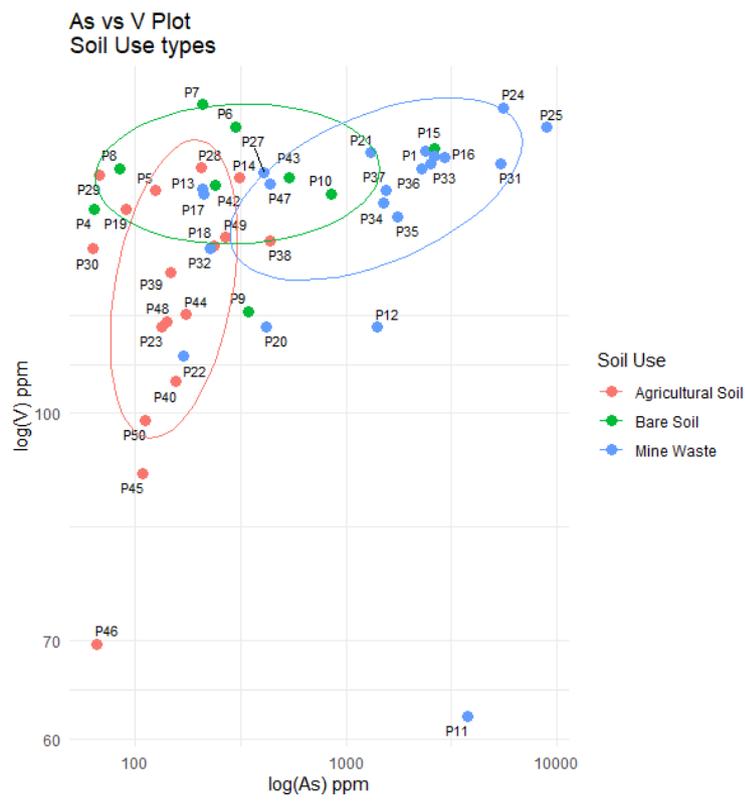
|       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Zn    | -0.54 | -0.18 | -0.27 | -0.41 | -0.5  | -0.45 | -0.66 | -0.53 | -0.54 |
| -0.54 | V     | 0.22  | 0.35  | 0.5   | 0.43  | 0.36  | 0.25  | 0.51  | 0.24  |
| -0.18 | 0.22  | Pb    | 0.61  | 0.6   | 0.75  | 0.75  | 0.29  | 0.54  | 0.6   |
| -0.27 | 0.35  | 0.61  | Mn    | 0.74  | 0.8   | 0.78  | 0.47  | 0.63  | 0.51  |
| -0.41 | 0.5   | 0.6   | 0.74  | Cr    | 0.85  | 0.83  | 0.47  | 0.74  | 0.58  |
| -0.5  | 0.43  | 0.75  | 0.8   | 0.85  | Fe(%) | 0.99  | 0.56  | 0.79  | 0.73  |
| -0.45 | 0.36  | 0.75  | 0.78  | 0.83  | 0.99  | Co    | 0.53  | 0.76  | 0.69  |
| -0.66 | 0.25  | 0.29  | 0.47  | 0.47  | 0.56  | 0.53  | Cu    | 0.59  | 0.6   |
| -0.53 | 0.51  | 0.54  | 0.63  | 0.74  | 0.79  | 0.76  | 0.59  | Ni    | 0.76  |
| -0.54 | 0.24  | 0.6   | 0.51  | 0.58  | 0.73  | 0.69  | 0.6   | 0.76  | As    |

Figure S1. A) Correlation matrix for the analysed elements by pXRF.

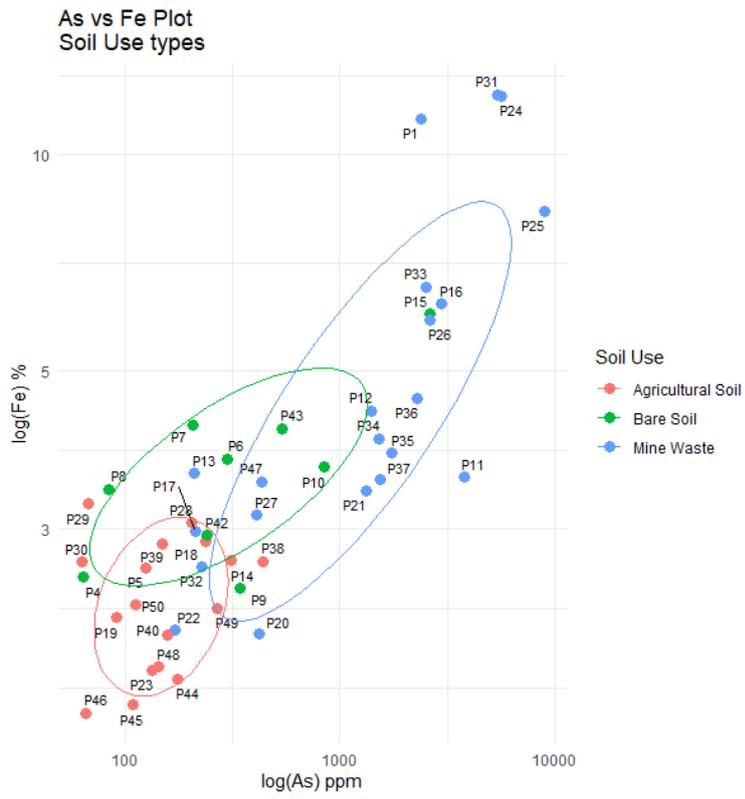
|      |      |      |      |      |       |
|------|------|------|------|------|-------|
| nir  | 1    | 0.88 | 0.76 | 0.82 | 0.87  |
| 1    | x2   | 0.88 | 0.78 | 0.83 | 0.88  |
| 0.88 | 0.88 | red  | 0.89 | 0.94 | 0.97  |
| 0.76 | 0.78 | 0.89 | x1   | 0.98 | 0.94  |
| 0.82 | 0.83 | 0.94 | 0.98 | blue | 0.99  |
| 0.87 | 0.88 | 0.97 | 0.94 | 0.99 | green |

Figure S1 b). Correlation diagram for the spectroradiometric data.

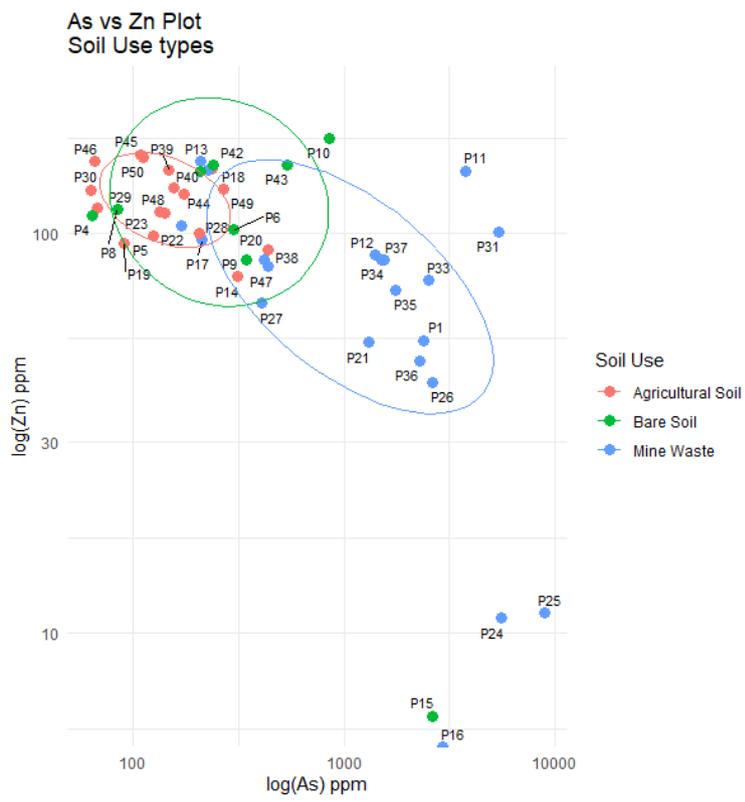
**Supplementary Material Figure S2** -Selected scatter plots of metals: discriminated (colors) by Soil Use.



S2 a) As vs V

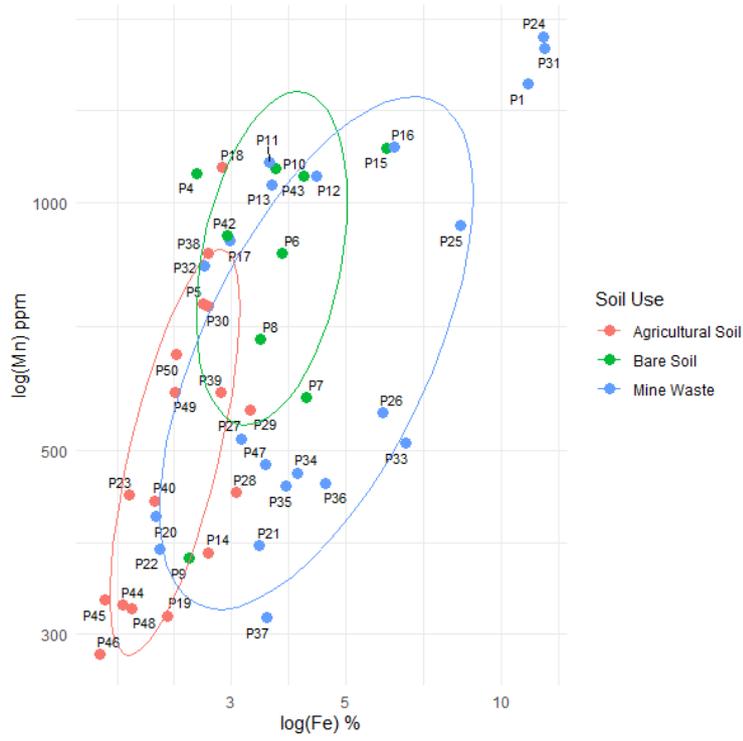


S2 b) As vs Fe



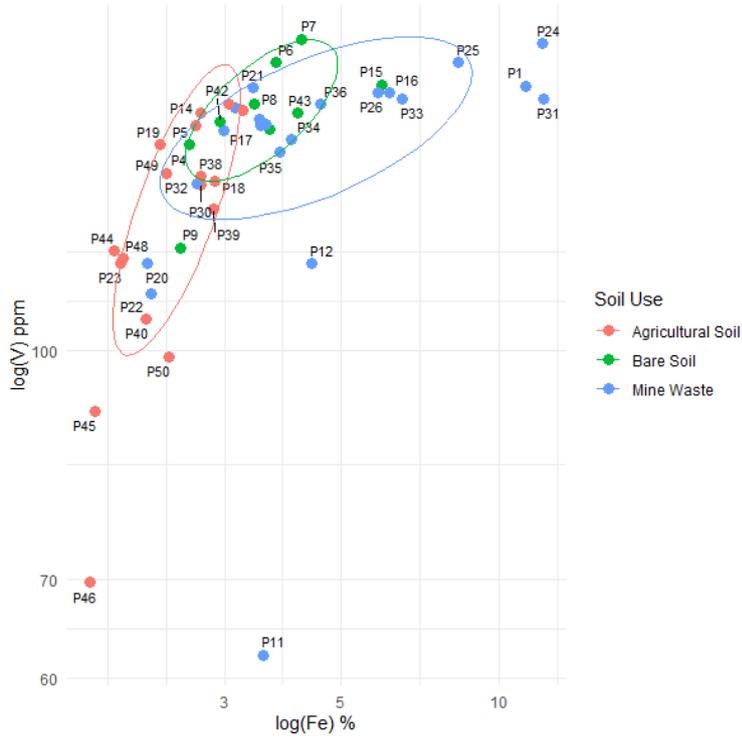
S2 c) As vs Zn

Fe vs Mn Plot  
Soil Use types



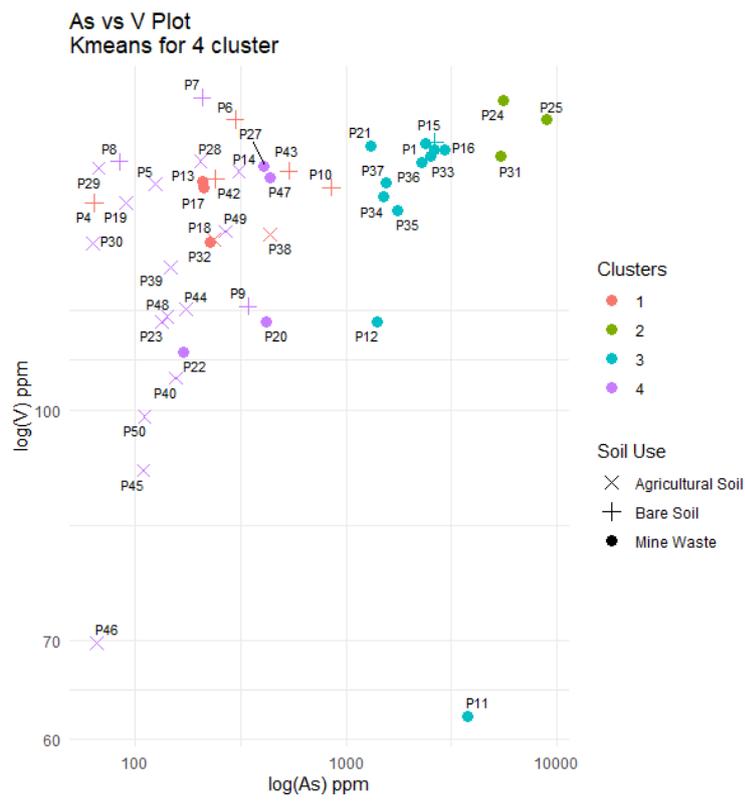
S2 d) Fe vs Mn

Fe vs V Plot  
Soil Use types

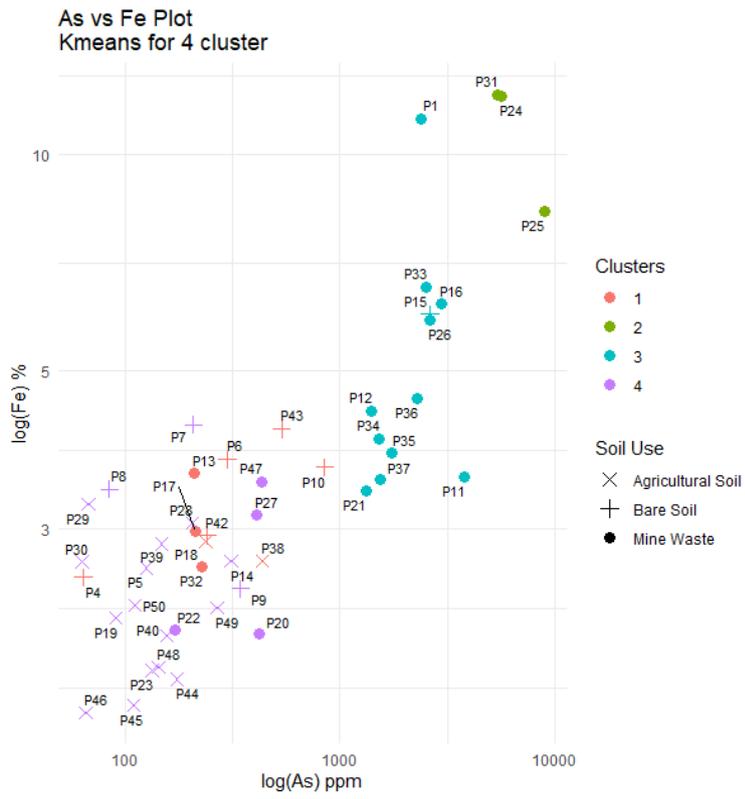


S2 e) Fe vs V

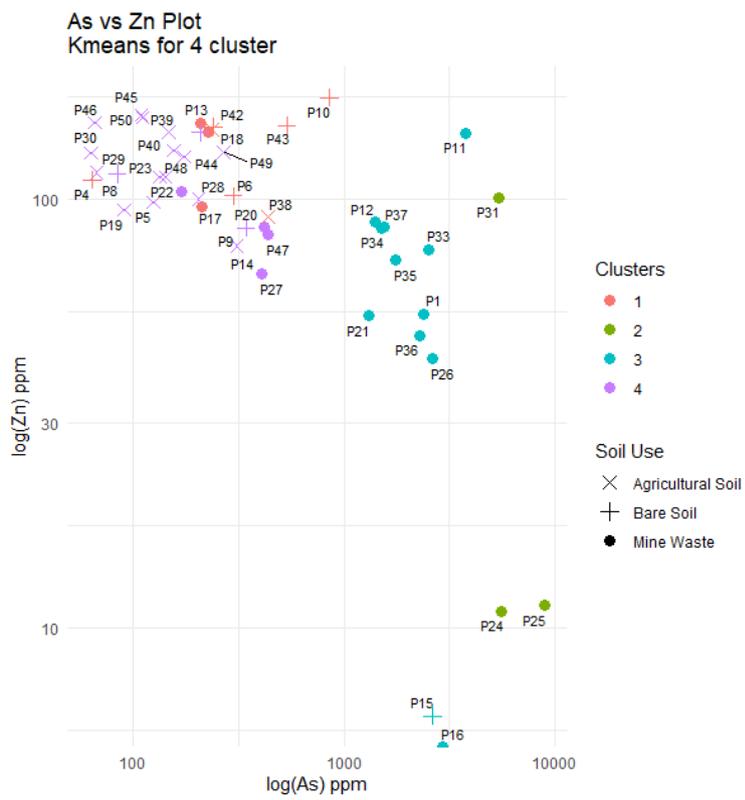
**Supplementary Material Figure S3** - Selected scatter plot of metals: discriminated by K-means cluster.



S3 a) As vs V

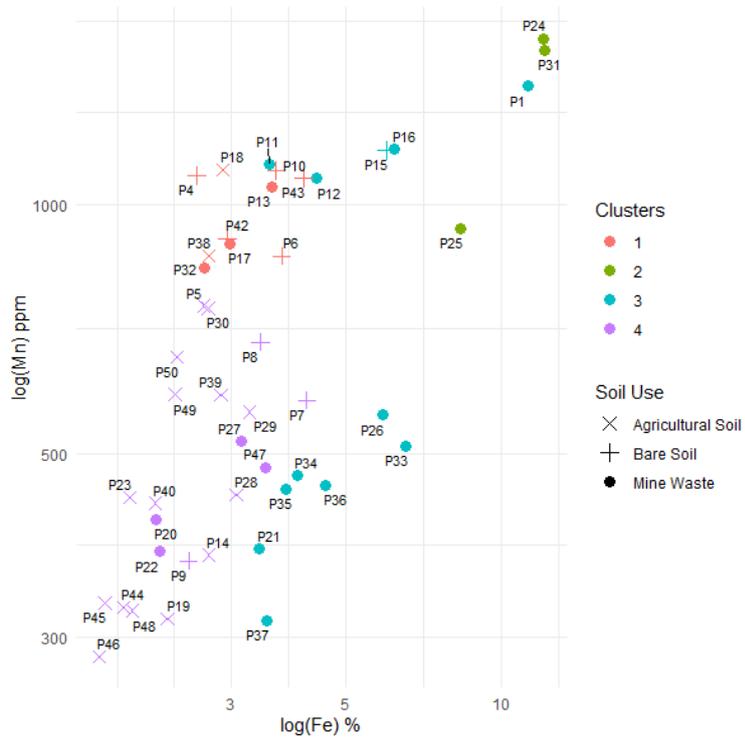


S3 b) As vs Fe

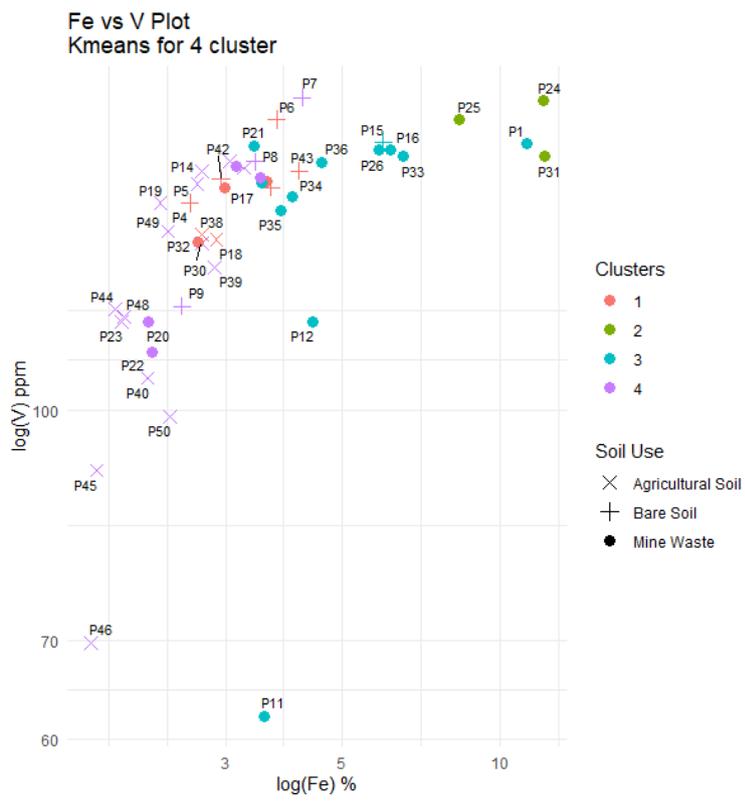


S3 c) As vs Zn

Fe vs Mn Plot  
Kmeans for 4 cluster

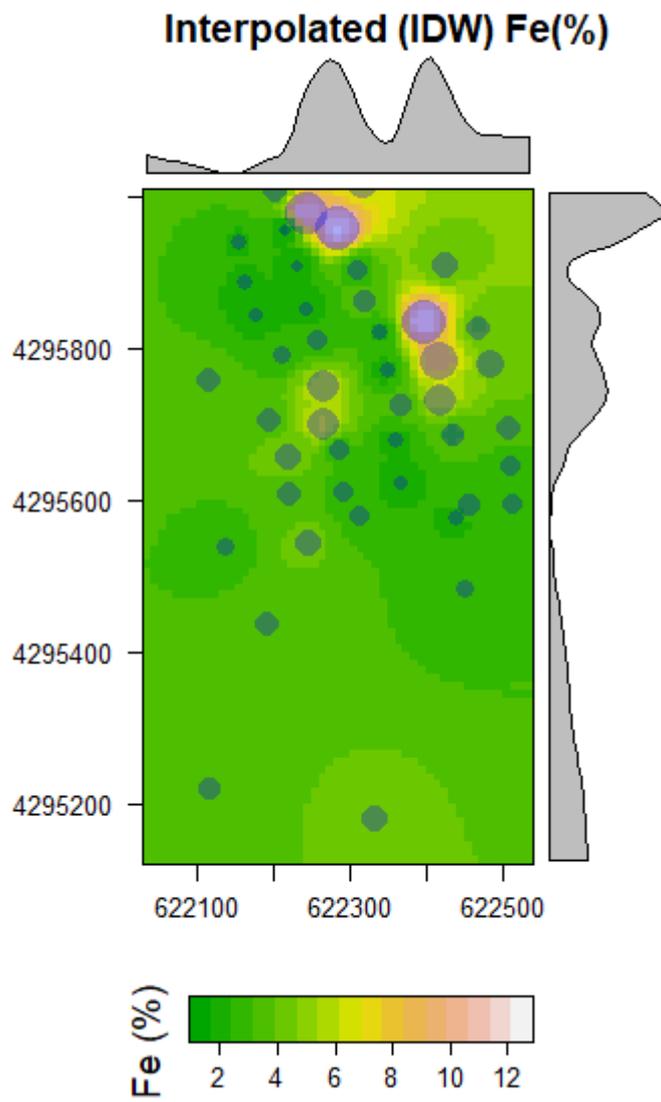


S3 d) Fe vs Mn

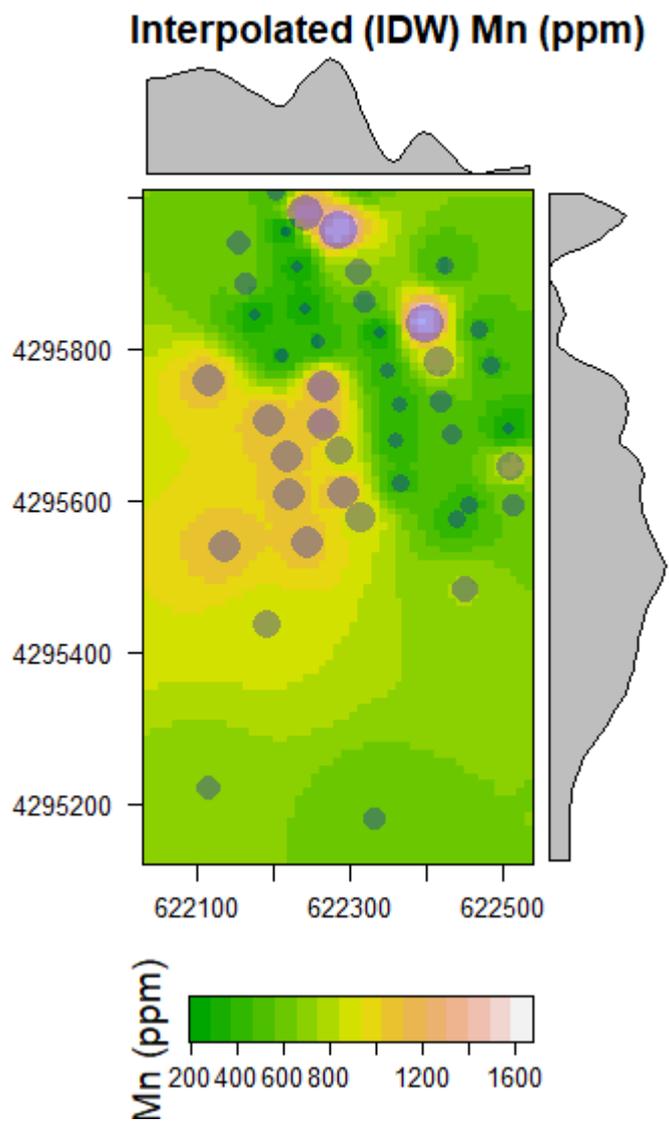


S3 e) Fe vs V

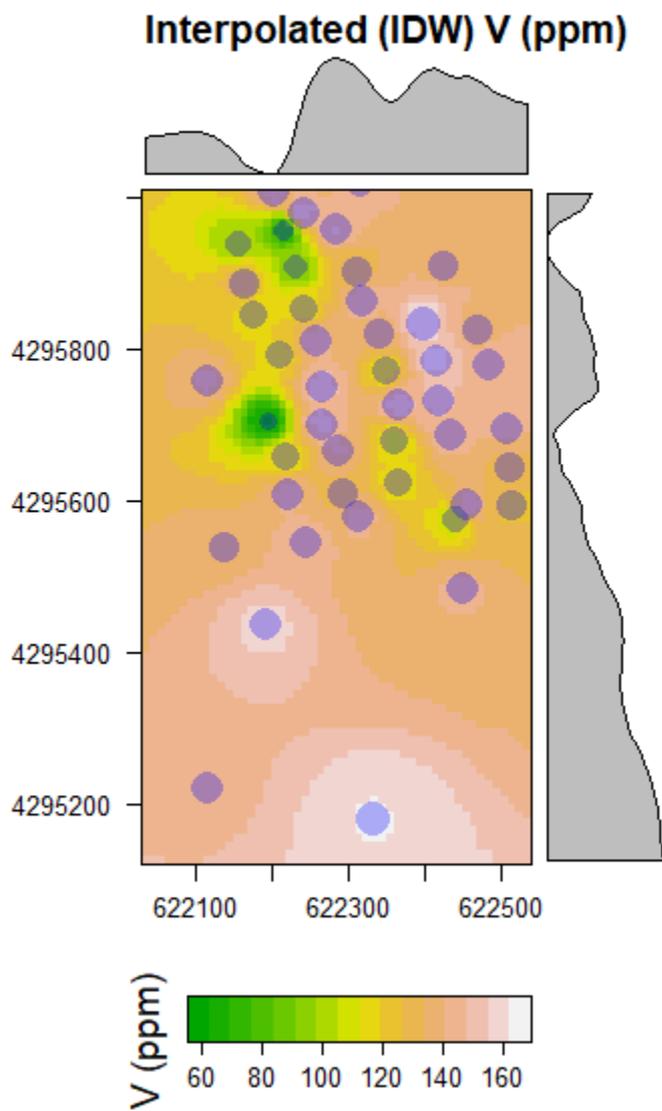
Supplementary Material Figure S4 - Interpolated maps (IDW) of Fe, Mn, and V.



S4 a) Interpolated (IDW) map with the Fe(%) distribution.



S4 b) Interpolated (IDW) map with the Mn (ppm) distribution.



S4 c) Interpolated (IDW) map with the V (ppm) distribution.