

|                     | Fe<br>(nM)               | Cu<br>(nM)       | Mn<br>(nM)        | Zn<br>(nM)                | Co<br>(pM)            | Ni<br>(nM)          | Cd<br>(pM)     | Pb<br>(pM)        |
|---------------------|--------------------------|------------------|-------------------|---------------------------|-----------------------|---------------------|----------------|-------------------|
| Air blanks<br>(n=7) | 0.10 ±<br>0.019<br>(n=6) | 0.018 ±<br>0.004 | 0.006 ±<br>0.0008 | 0.042 ±<br>0.006<br>(n=4) | 0.45 ±<br>0.28        | 0.021<br>±<br>0.014 | 0.28 ±<br>0.23 | 2.70<br>±<br>0.53 |
| LoD                 | 0.058                    | 0.012            | 0.002             | 0.019                     | 0.9                   | 0.041               | 0.7            | 1.6               |
| SaFe S1<br>(n=4)    | 0.089 ±<br>0.01          | 0.505 ±<br>0.018 | 0.87 ±<br>0.01    | 0.082 ±<br>0.024          | 4.2 ±<br>0.6          | 2.29 ±<br>0.01      | 2.4 ±<br>3.7   | 47.5<br>± 1       |
| Consensus           | 0.095 ±<br>0.008         | 0.53 ±<br>0.05   | 0.810 ±<br>0.06   | 0.071 ±<br>0.01           | 5 ± 1                 | 2.34 ±<br>0.09      | 1.0 ±<br>0.3   | 50 ±<br>3         |
| SaFe D2<br>(n=9)    | 0.986 ±<br>0.083         | 2.399 ±<br>0.069 | 0.421 ±<br>0.029  | 8.076 ±<br>0.300          | 48 ±<br>1.1<br>(*n=4) | 8.688<br>±<br>0.157 | 1000 ±<br>26   | 28.2<br>± 1.7     |
| Consensus           | 1.011 ±<br>0.024         | 2.34 ±<br>0.15   | 0.36 ±<br>0.05    | 7.62 ±<br>0.26            | 47 ± 3                | 8.85 ±<br>0.26      | 1005 ±<br>20   | 29 ±<br>2         |
| NASS-7<br>(n=4)     | 6.18 ±<br>0.27           | 2.92 ±<br>0.05   | 13.65 ±<br>0.38   | 6.54 ±<br>0.12            | 244 ±<br>5.6          | 4.31 ±<br>0.37      | 142 ±<br>3     | 12.9<br>± 1.5     |
| Consensus           | 6.27 ±<br>0.46           | 3.16 ±<br>0.22   | 13.64 ±<br>1.1    | 6.36 ±<br>1.2             | 247 ±<br>23.7         | 4.13 ±<br>0.30      | 145 ±<br>1.4   | 12.5<br>± 3.8     |

Table S1. The blanks, limit of detection (LoD;  $3\sigma$  of air blank), and reference material values measured using seaFAST-pico preconcentration system and the respective consensus value for each metal presented in  $\text{nmol L}^{-1}$ . Consensus values were converted to  $\text{nmol L}^{-1}$  using an assumed seawater density of  $1.025 \text{ kg L}^{-1}$ . Consensus values for SaFe reference material can be found at:

<https://websites.pmc.ucsc.edu/~kbruland/GeotracesSaFe/kwbGeotracesSaFe.html>

Certified values for NASS-7 can be found at:

<https://nrc.canada.ca/en/certifications-evaluations-standards/certified-reference-materials/list/68/html>