Supplementary information to the article "*Arsenic pollution of groundwater in Vietnam exacerbated by deep aquifer exploitation for more than a century*", published in PNAS. doi:10.1073/pnas.1011915108

Weblink: www.eawag.ch/arsenic-vietnam

Quality Assurance and Quality Control (QA/QC)

The robustness of the chemical analyses was assured by intermittent analysis of certified reference samples (SLRS-4 River Water Canada, TM-28.2 Lake Ontario, SPS-SW2 Surface Water Level 2 and reference samples from the international interlaboratory quality evaluations ARS13-16, ARS17-20, and ARS21-24 (*1*). In addition, cross-evaluation between different analytical techniques applied in our laboratories in Vietnam and Switzerland were carried out, e.g. AAS versus ICP-MS (see results in Table S1 below).
The results of certified samples and cross-checking agreed within ±5%. Calibration curves had r^2 >0.999 with the exception of Na and K where r^2 were 0.990 (ICP-OES). Standard deviations of triplicates were always <5%. The limits of quantification (LOQ, 10 x standard deviation of noise) were:

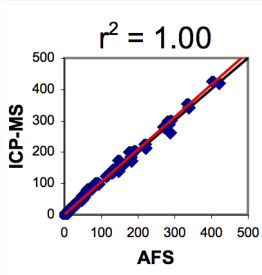
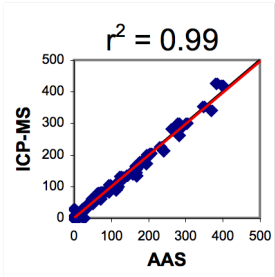
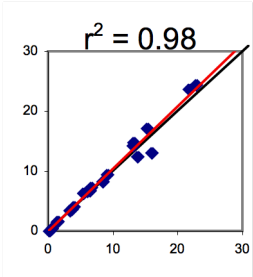
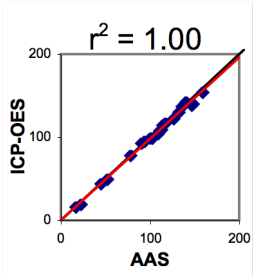
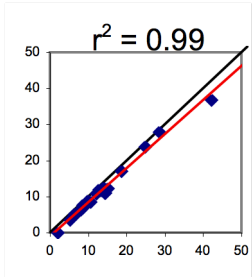
0.1 mg/L	for As, Cd, Co, Cr, Cu, Hg, Li, Ni, Pb, Sb, Se, U, and Zn
0.5 µg/L	for Al
1 µg/L	for B
5 mg/L	for Ba
0.01 mg/L	for Fe, Mn and Ammonium (NH_4^+-N)
0.1 mg/L	for Ca, K, Mg, Na, Phosphate (PO_4^{3-}-P), and Sulphate (SO_4^{2-})
0.25 mg/L	for Nitrate (NO_3^--N)
0.5 mg/L	for Chloride (Cl^-) and Dissolved Organic Carbon (DOC)
1 mg/L	for Br and I
2 mg/L	for Si
12 mg/L	for HCO_3^- (0.2 mmol/L)

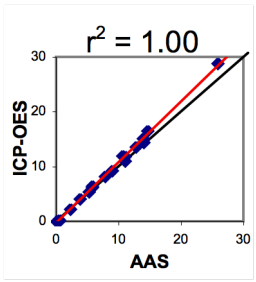
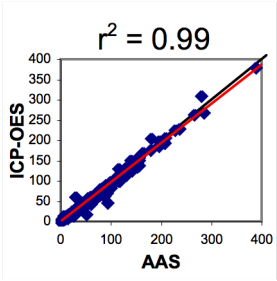
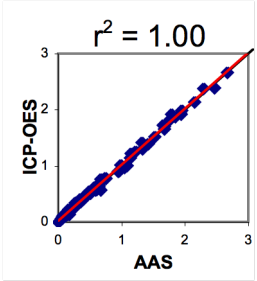
Reference

1. Berg M, Stengel C (2006) ARS21-24 arsenic reference samples Interlaboratory Quality Evaluation (IQE). Report to Participants, Eawag, Swiss Federal Institute of Aquatic Science and Technology, Dubendorf, Switzerland.

Table S1. Cross-correlations of selected parameters determined by various methods in our laboratories in Vietnam and Switzerland.

(1) Analyses conducted by the Swiss Federal Institute of Aquatic Science and Technology (Eawag), Dübendorf, Switzerland.
(2) Analyses conducted by the Research Centre for Environmental Technology and Sustainable Development (CETASD), Hanoi University of Science, Vietnam National University.

Parameter	Analytical methods	Samples	Cross-correlation
Arsenic (A)	ICP-MS(1) vs. AFS(1)	n = 216	
Arsenic (B)	ICP-MS(1) vs. AAS(2)	n = 461	
Ammonium	Photometry(1) vs. Photometry(2)	n = 21	
Calcium	ICP-OES(1) vs. AAS(2)	n = 21	
Chloride	IC(1) vs. IC(2)	n = 21	

Iron	ICP-OES[1] vs. AAS[2]	n = 21	
Magnesium	ICP-OES[1] vs. AAS[2]	n = 460	
Manganese	ICP-OES[1] vs. AAS[2]	n = 74	
Silicon	Photometry[1] vs. Photometry[2]	n = 21