**Supplementary materials:**

*Physicochemical environment of the water at the vent mouth, surrounding water and surface water*

From one-way ANOVA, concentration of Ca2+ (F (4, 10) = 12.6, p < 0.05) Cl- (F (4, 10) = 283.5, p < 0.05), Fe2+, 3+ ((F (32.2, 10) = 152.5, p < 0.05) Mg2+ (F (4, 10) = 20.3, p < 0.05) Mn2+ (F (4, 10) = 152.5, p < 0.05) NO3- ((F (4, 10) = 43.2, p < 0.05) and SiO2 (F (4, 10) = 8.3, p < 0.05) was significantly different among the fluids from the yellow and white vents, 1 m apart from both vents and on the surface water. Mn2+ and SO42- did not differ among regions. Among the cations and anions tested, yellow vents have significantly greater concentration of Fe2+, 3+ (yellow vent: 1.93 ± 0.75 , white vent: 1.46 ± 1.2 mmol kg-1) and SiO2 (yellow vent: 110.0 ± 91.0 , white vent: 53.8 ± 22.9 mmol kg-1) than white vents (p < 0.05, SNK tests), whilst concentrations of others ions were similar between the two vents (Supplementary Fig. 1).

Comparing the physicochemical environment of the vent mouths and waters at 1 m apart from the vents, Al3+, PO42-, and S2- were only present in fluids from the yellow and white vents but absent from the waters at 1 m apart from the yellow and white vents. From SNK tests, fluids from the yellow vents contained significantly higher concentration of Fe2+, 3+ (yellow vents: 1.93 ± 0.75, 1 m apart from yellow vents: 0.1 ± 0.12 mmol kg-1) and SiO2 (yellow vents: 110.0 ± 91, 1 m apart from yellow vents: 8.2 ± 1.8 mmol kg-1) but lower concentration of NO3- (yellow vents: 18.0 ± 3.4 m apart from yellow vents: 20.1 ± 1.6 mmol kg-1) from the waters at 1 m apart from the yellow vent. Fluids from the mouth of the white vents have significantly greater concentration of SiO2 (white vents: 53.8 ± 22.9 m apart from white vents: 9.3 ± 2.9 mmol kg-1) but lower concentration of NO3- (white vents: 16.3 ± 1.2 m apart from white vents: 20.0 ± 0.8 mmol kg-1) from the waters at 1 m apart from the yellow vent (Supplementary Fig. 1).

From SNK pairwise comparisons, the surface water above the vent region have significantly higher concentration of Ca2+, Mg2+, Cl-, and lower concentration of NO3- than the fluid collected from the white and yellow vents and waters at 1 m apart from yellow and white vents. Arsenic in the fluids from the mouths of yellow (0.03 mgl-1) appears to be higher than the fluid collected at the mouth of the white vents (0.002 mgl-1) and the waters at 1 m apart from the yellow and white vents (0.002 mgl-1 for both regions) (Supplementary Fig. 1).