

**Table S1.** Laboratory tests samples physico-chemical parameters.

|              |      | EC ( $\mu\text{S}/\text{cm}$ ) | $\text{HCO}_3^-$ (mg/l) | $\text{SiO}_2$ (mg/L) | $\text{NO}_3^-$ (mg/L) | $\text{NH}_4^+$ (mg/L) | pH    |
|--------------|------|--------------------------------|-------------------------|-----------------------|------------------------|------------------------|-------|
| Column tests | MA1  | 650                            | 57.575                  | 3.116                 | 199.561                | 1.151                  | 6.941 |
|              | MA2  | 786                            | 57.836                  | 7.324                 | 276.979                | 1.307                  | 7.159 |
|              | MA3  | 576                            | 70.305                  | 9.785                 | 130.252                | 1.151                  | 7.379 |
|              | MA4  | 466                            | 81.863                  | 8.515                 | 53.593                 | 1.082                  | 7.445 |
|              | MA5  | 406                            | 96.827                  | 11.214                | 80.455                 | 1.203                  | 7.500 |
|              | MA6  | 369                            | 92.292                  | 11.135                | 29.139                 | 1.099                  | 7.504 |
|              | MAM1 | 11680                          | 517.222                 | 25.665                | 1014.546               | 6.894                  | 7.151 |
|              | MAM2 | 9455                           | 547.017                 | 25.188                | 652.542                | 6.026                  | 7.365 |
|              | MAM3 | 6298                           | 637.187                 | 30.270                | 394.058                | 4.916                  | 7.456 |
|              | MAM4 | 3937                           | 695.037                 | 32.176                | 150.778                | 5.801                  | 7.717 |
|              | MAM5 | 2549                           | 620.801                 | 32.970                | 17.608                 | 5.731                  | 7.817 |
|              | MAM6 | 1559                           | 637.609                 | 29.952                | 0.000                  | 5.020                  | 7.875 |
|              | PM1  | 1638                           | 130.706                 | 8.674                 | 655.836                | 2.695                  | 7.577 |
|              | PM2  | 1534                           | 70.968                  | 14.073                | 514.430                | 1.932                  | 7.052 |
|              | PM3  | 958                            | 103.531                 | 18.678                | 343.121                | 1.585                  | 7.112 |
|              | PM4  | 964                            | 134.902                 | 18.519                | 215.399                | 1.637                  | 7.271 |
|              | PM5  | 824                            | 161.257                 | 19.869                | 232.758                | 1.862                  | 7.354 |
|              | PM6  | 726                            | 155.269                 | 18.757                | 176.627                | 1.966                  | 7.448 |
|              | PMM1 | 11347                          | 967.225                 | 60.600                | 1004.537               | 14.510                 | 7.613 |
|              | PMM2 | 8832                           | 907.701                 | 54.090                | 831.073                | 14.250                 | 7.670 |
|              | PMM3 | 6355                           | 913.131                 | 61.236                | 598.564                | 12.480                 | 7.665 |
|              | PMM4 | 4524                           | 913.295                 | 64.253                | 442.080                | 11.509                 | 7.746 |
|              | PMM5 | 3237                           | 1001.088                | 65.841                | 150.652                | 12.116                 | 7.775 |
|              | PMM6 | 2380                           | 920.967                 | 65.047                | 26.731                 | 10.745                 | 7.793 |
| Flask tests  | PM1  | 286                            | 75.211                  | 3.680                 | 5.740                  | 0.310                  | 7.752 |
|              | PM2  | 282                            | 106.854                 | 3.445                 | 9.959                  | 0.249                  | 8.486 |
|              | PM3  | 278                            | 101.262                 | 3.758                 | 6.589                  | 0.318                  | 7.702 |
|              | MA1  | 270                            | 73.559                  | 3.288                 | 19.424                 | 0.336                  | 7.415 |
|              | MA2  | 262                            | 91.370                  | 3.209                 | 3.725                  | 0.310                  | 7.523 |
|              | MA3  | 278                            | 84.747                  | 3.288                 | 2.496                  | 0.370                  | 7.896 |
|              | PMM1 | 584                            | 161.391                 | 13.319                | 2.052                  | 2.565                  | 8.397 |
|              | PMM2 | 608                            | 166.227                 | 15.670                | 11.353                 | 3.727                  | 8.357 |
|              | PMM3 | 603                            | 170.776                 | 13.946                | 3.396                  | 3.701                  | 8.692 |
|              | MAM1 | 608                            | 167.364                 | 14.337                | 2.040                  | 2.036                  | 8.400 |
|              | MAM2 | 596                            | 152.702                 | 14.964                | 1.102                  | 1.862                  | 8.521 |
|              | MAM3 | 622                            | 175.169                 | 14.729                | 8.983                  | 2.123                  | 8.564 |

**Table S2.** Groundwater physico-chemical parameters.

| Month     | Value | Fl <sup>-</sup> | Cl <sup>-</sup> | NO <sub>2</sub> <sup>-</sup> | NO <sub>3</sub> <sup>-</sup> | SO <sub>4</sub> <sup>2-</sup> | Na <sup>+</sup> | NH <sub>4</sub> <sup>+</sup> | K <sup>+</sup> | Mg <sub>2</sub> <sup>+</sup> | Ca <sub>2</sub> <sup>+</sup> | SiO <sub>2</sub> | EC    | pH    |
|-----------|-------|-----------------|-----------------|------------------------------|------------------------------|-------------------------------|-----------------|------------------------------|----------------|------------------------------|------------------------------|------------------|-------|-------|
| July      | Min   | 0.153           | 4.514           | NA                           | 9.893                        | 7.626                         | 3.762           | 0.035                        | 1.156          | 8.626                        | 35.687                       | 6.449            | 498.0 | 6.910 |
|           | Mean  | 0.194           | 6.307           | NA                           | 14.137                       | 10.027                        | 5.833           | 1.426                        | 2.065          | 11.575                       | 42.607                       | 8.162            | 522.5 | 7.005 |
|           | Max   | 0.235           | 8.101           | NA                           | 22.536                       | 12.428                        | 7.904           | 2.816                        | 2.974          | 14.524                       | 49.527                       | 9.875            | 547.0 | 7.100 |
|           | SD    | 0.058           | 2.537           | NA                           | 5.939                        | 3.395                         | 2.929           | 1.967                        | 1.285          | 4.170                        | 9.786                        | 2.422            | 34.6  | 0.134 |
| August    | Min   | 0.231           | 3.724           | 1.405                        | 1.339                        | 11.744                        | 4.065           | 0.031                        | 0.960          | 8.947                        | 18.961                       | 6.019            | 370.0 | 7.210 |
|           | Mean  | 0.280           | 7.261           | 1.869                        | 20.298                       | 14.020                        | 6.734           | 0.122                        | 2.024          | 12.837                       | 31.621                       | 10.694           | 505.4 | 7.510 |
|           | Max   | 0.337           | 9.143           | 2.199                        | 45.778                       | 19.368                        | 9.509           | 0.257                        | 4.726          | 16.950                       | 44.882                       | 21.837           | 597.0 | 7.732 |
|           | SD    | 0.033           | 1.605           | 0.268                        | 18.545                       | 2.691                         | 1.763           | 0.091                        | 1.342          | 2.572                        | 8.862                        | 4.742            | 79.5  | 0.192 |
| September | Min   | 0.238           | 7.837           | NA                           | 1.128                        | 15.577                        | 4.538           | 0.052                        | 0.996          | 8.419                        | 28.019                       | 5.887            | 328.0 | 6.860 |
|           | Mean  | 0.278           | 9.141           | NA                           | 31.241                       | 18.793                        | 7.216           | 0.123                        | 1.951          | 14.110                       | 39.569                       | 7.414            | 437.9 | 7.639 |
|           | Max   | 0.306           | 11.389          | NA                           | 64.181                       | 22.176                        | 10.711          | 0.194                        | 3.047          | 18.240                       | 51.250                       | 10.995           | 522.0 | 8.087 |
|           | SD    | 0.025           | 1.177           | NA                           | 26.033                       | 2.326                         | 1.988           | 0.101                        | 0.763          | 3.491                        | 8.160                        | 2.041            | 66.1  | 0.501 |
| October   | Min   | 0.234           | 6.572           | 1.298                        | 0.796                        | 15.114                        | 3.730           | 0.018                        | 0.800          | 6.742                        | 21.479                       | 3.973            | 390.0 | 7.510 |
|           | Mean  | 0.270           | 8.923           | 1.922                        | 25.273                       | 18.565                        | 6.186           | 0.043                        | 1.303          | 11.954                       | 31.643                       | 6.657            | 567.6 | 7.755 |
|           | Max   | 0.299           | 10.467          | 2.220                        | 46.267                       | 20.931                        | 8.791           | 0.077                        | 2.043          | 16.145                       | 45.321                       | 8.577            | 632.0 | 7.890 |
|           | SD    | 0.022           | 1.206           | 0.319                        | 19.059                       | 1.895                         | 1.814           | 0.024                        | 0.407          | 4.188                        | 7.854                        | 1.704            | 81.6  | 0.132 |
| November  | Min   | 0.234           | 7.595           | NA                           | 0.796                        | 16.853                        | 6.146           | 0.027                        | 1.062          | 9.149                        | 51.132                       | 9.762            | 422.0 | 7.181 |
|           | Mean  | 0.256           | 10.371          | NA                           | 39.802                       | 18.928                        | 7.836           | 0.048                        | 2.381          | 16.116                       | 90.361                       | 12.184           | 537.4 | 7.386 |
|           | Max   | 0.323           | 17.246          | NA                           | 95.938                       | 20.688                        | 9.974           | 0.081                        | 5.461          | 19.021                       | 120.508                      | 14.084           | 687.0 | 7.497 |
|           | SD    | 0.029           | 3.062           | NA                           | 39.978                       | 1.461                         | 1.323           | 0.029                        | 1.434          | 3.081                        | 19.639                       | 1.533            | 79.2  | 0.119 |
| December  | Min   | 0.136           | 7.199           | 1.027                        | 2.363                        | 11.807                        | 6.308           | 0.014                        | 1.098          | 12.023                       | 60.179                       | 7.702            | 365.0 | 7.387 |
|           | Mean  | 0.177           | 8.987           | 1.027                        | 20.354                       | 13.728                        | 7.864           | 0.123                        | 2.445          | 16.909                       | 95.741                       | 12.937           | 526.5 | 7.732 |
|           | Max   | 0.235           | 11.578          | 1.027                        | 38.890                       | 16.204                        | 9.867           | 0.262                        | 5.497          | 19.044                       | 118.131                      | 15.785           | 643.0 | 8.046 |
|           | SD    | 0.028           | 1.512           | NA                           | 18.270                       | 1.264                         | 1.128           | 0.120                        | 1.246          | 2.127                        | 16.478                       | 2.502            | 72.1  | 0.250 |