

**Supplemental Table S1. Geochemistry of Kidd Creek Borehole Fluids and Service Water.**

| Date                                           | January 24-25 2017 |         |         | June 06-07 2017 |         |         | January 28-29 2018 |         |         |
|------------------------------------------------|--------------------|---------|---------|-----------------|---------|---------|--------------------|---------|---------|
| Sample                                         | Service Water      | FW12261 | FW12299 | Service Water   | FW12261 | FW12299 | Service Water      | FW12261 | FW12299 |
| $\delta^{13}\text{C}_{\text{CH}_4}$ (‰)        | NR                 | -39.6   | -38.5   | NR              | -38.5   | -39.1   | NR                 | -38.5   | -39.0   |
| $\delta^{18}\text{O}_{\text{H}_2\text{O}}$ (‰) | -10.6              | -12.4   | -12.4   | -12.4           | -11.6   | -11.1   | -10.7              | NM      | -12.4   |
| $\delta^2\text{H}_{\text{H}_2\text{O}}$ (‰)    | -80.8              | -33.6   | -34.2   | -89.8           | -33.9   | -34.1   | -83.1              | NM      | -35.5   |
| $\text{Li}^+$ (µg/L)                           | <500               | <500    | 616     | <500            | <500    | 636     | <500               | NM      | <5000   |
| $\text{Na}^+$ (mg/L)                           | 377                | 17300   | 15300   | 194             | 17900   | 17300   | 261                | NM      | 14900   |
| $\text{K}^+$ (mg/L)                            | 53                 | 108     | 100     | 25              | 118     | 123     | 54                 | NM      | 195     |
| $\text{Mg}^{2+}$ (mg/L)                        | 106                | 2020    | 2220    | 76              | 2120    | 2460    | 52                 | NM      | 2110    |
| $\text{Ca}^{2+}$ (mg/L)                        | 422                | 65500   | 49700   | 350             | 68300   | 58200   | 322                | NM      | 50800   |
| $\text{Cl}^-$ (mg/L)                           | 252                | 136000  | 115000  | 201             | 120000  | 110000  | 232                | NM      | 125000  |
| $\text{Br}^-$ (mg/L)                           | 3                  | 2000    | 1730    | 2               | 1910    | 1760    | 3                  | NM      | 1890    |
| $\text{NO}_3^-$ (mg/L)                         | 18                 | <2      | <2      | 15              | <5      | <5      | 6                  | NM      | <20     |
| $\text{NO}_2^-$ (mg/L)                         | 2                  | <2      | <2      | <0.1            | <5      | <5      | <0.2               | NM      | <20     |
| $\text{HPO}_4^{2-}$ (mg/L)                     | <0.2               | <4      | <4      | <0.2            | <10     | <10     | <0.4               | NM      | <30     |
| $\text{SO}_4^{2-}$ (mg/L)                      | 1930               | 20      | 25      | 1300            | 10      | 10      | 1300               | NM      | <40     |
| Mn (µg/L)                                      | 3370               | 33400   | 24900   | 2500            | 33900   | 28700   | 1100               | NM      | 22100   |
| Fe (mg/L)                                      | <5                 | 26      | 35      | <5              | 17      | 16      | 1                  | NM      | 10      |
| Zn (µg/L)                                      | 36900              | <250    | <250    | 29500           | <250    | <250    | 7400               | NM      | <500    |
| Ba (µg/L)                                      | <50                | 43800   | 41700   | <50             | 43300   | 42900   | <200               | NM      | 32700   |
| B (µg/L)                                       | <1500              | 3140    | 2880    | <1500           | 3450    | 3540    | NM                 | NM      | NM      |
| Sr (mg/L)                                      | 4                  | 1200    | NM      | 3               | 1100    | 997     | 3                  | NM      | 971     |
| Total Dissolved Solids (mg/L)                  | 5125               | 225235  | 185062  | 4042            | 212552  | 191887  | 2520               | NM      | 197274  |

NM - not measured

NR - not relevant

**Supplemental Table S2. Borehole and service water conditions.**

| Sample                                   | FW12261<br>2017A        | FW12261<br>2017B        | FW12261<br>2018         | FW12299<br>2017A        | FW12299<br>2017B        | FW12299<br>2018         | Biofilm A    | Biofilm B   | Service Water<br>2018 |
|------------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------|-------------|-----------------------|
| Borehole                                 | 12261                   | 12261                   | 12261                   | 12299                   | 12299                   | 12299                   | 12261        | 12261       | NR                    |
| Date Installed                           | Jul 12 2016             | Jul 12 2016             | Jun 06 2017             | Jan 24 2017             | Jan 24 2017             | Jun 06 2017             | NR           | NR          | NR                    |
| Date Collected                           | Jan 24 2017             | Jan 24 2017             | Jan 28 2018             | Jun 06 2017             | Jun 06 2017             | Jan 28 2018             | July 12 2016 | Jun 06 2017 | Jan 28 2018           |
| Deployment<br>Duration (days)            | 196                     | 196                     | 236                     | 133                     | 133                     | 236                     | NR           | NR          | NR                    |
| Flow rate at<br>installation<br>(mL/min) | NM                      | NM                      | Gas: 2729<br>Water: 134 | Gas: 3082<br>Water: 280 | Gas: 3082<br>Water: 280 | Gas: 2729<br>Water: 134 | NR           | NR          | NR                    |
| Flow rate at<br>removal (mL/min)         | Gas: 3082<br>Water: 280 | Gas: 3082<br>Water: 280 | Gas: 5938<br>Water: 127 | Gas: 2729<br>Water: 134 | Gas: 2729<br>Water: 134 | Gas: 5938<br>Water: 127 | NR           | NR          | NR                    |
| Average<br>Temperature (°C)              | 25                      | 25                      | 25                      | 24.5                    | 24.5                    | 24.5                    | 25           | 25          | 23.6                  |
| Average pH                               | 6.3                     | 6.3                     | 6.3                     | 6.7                     | 6.7                     | 6.7                     | 6.3          | 6.3         | 7.2                   |

NM - not measured

NR - not relevant

**Supplemental Table S3. Relative abundance (mole %) of each PLFA detected in all biosamplers, biofilms and service water samples. Where values are absent, PLFA was below the limit of quantification (LoQ < 0.50 µg/mL).**

| PLFA                  | FW12261<br>2017A | FW12261<br>2017B | FW12261<br>2018 | FW12288<br>2017A | FW12288<br>2017B | FW12288<br>2018 | Biofilm<br>2016 | Biofilm<br>2017 | Service<br>Water 2018 |
|-----------------------|------------------|------------------|-----------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------------|
| 12:0                  | 0.4              |                  | 3               | 11               | 26               | 6               |                 |                 |                       |
| 13:0                  |                  |                  |                 | 1                | 0.3              |                 |                 |                 |                       |
| 14:0                  | 2                | 1                | 3               | 5                | 7                | 3               | 1               | 1               | 1                     |
| 15:0                  | 0.3              | 0.2              | 1               | 0.2              | 0.1              | 0.3             | 2               | 3               | 1                     |
| 16:0                  | 26               | 12               | 26              | 24               | 29               | 53              | 41              | 50              | 22                    |
| 17:0                  | 0.4              | 0.2              | 1               | 0.2              | 0.3              | 1               | 2               | 2               | 0.5                   |
| 18:0                  | 8                | 13               | 11              | 30               | 23               | 20              | 5               | 5               | 1                     |
| 19:0                  |                  |                  |                 |                  |                  |                 |                 | 0.2             |                       |
| 20:0                  |                  |                  | 0.5             | 0.01             | 0.3              | 1               |                 | 0.1             |                       |
| 22:0                  |                  |                  | 0.4             |                  |                  |                 |                 |                 |                       |
| 23:0                  |                  |                  |                 |                  |                  | 1               |                 |                 |                       |
| 24:0                  |                  |                  |                 |                  |                  | 1               |                 |                 |                       |
| 14:1 <sup>x</sup>     | 0.1              |                  |                 |                  |                  |                 |                 |                 |                       |
| 15:1 <sup>x</sup>     | 0.1              | 0.1              |                 | 3                | 1                |                 |                 |                 | 1                     |
| 16:1 <sup>x</sup>     | 5                | 8                | 1               | 0.3              |                  | 0.2             | 0.4             | 1               | 49                    |
| 16:1 <sup>9</sup>     |                  |                  | 4               | 1                | 1                | 1               | 5               | 5               |                       |
| 17:1 <sup>x</sup>     | 0.1              | 0.2              | 0.4             |                  |                  | 0.3             |                 |                 | 0.3                   |
| 17:1 <sup>10</sup>    |                  |                  | 1               |                  |                  |                 | 2               | 1               |                       |
| 18:1 <sup>9c</sup>    | 8                | 13               | 0               | 4                | 4                | 9               | 33              | 16              | 2                     |
| 18:1 <sup>9t</sup>    | 8                | 13               | 34              | 1                | 1                | 2               | 2               | 4               | 17                    |
| 18:1 <sup>x</sup>     | 0.3              | 0.1              | 3               |                  |                  |                 |                 |                 |                       |
| 19:1 <sup>x</sup>     |                  |                  |                 |                  |                  |                 | 0.1             |                 | 1                     |
| 20:1 <sup>x</sup>     | 0.004            | 0.1              |                 |                  |                  |                 |                 | 0.1             |                       |
| 18:3 <sup>x,y,z</sup> |                  |                  |                 |                  |                  |                 |                 |                 | 0.3                   |
| 18:2c <sup>9,12</sup> | 1                | 1                |                 | 0.2              | 0.3              | 1               | 3               | 2               | 0.4                   |
| 18:2 <sup>x,y</sup>   |                  |                  | 8               |                  |                  |                 |                 |                 |                       |
| br14:0                |                  |                  |                 |                  |                  |                 |                 | 0.1             |                       |
| br15:0                |                  |                  |                 | 6                |                  |                 |                 |                 |                       |

