Table DR1: Sample number, description and location

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Description</th>
<th>UTM northing</th>
<th>UTM easting</th>
</tr>
</thead>
<tbody>
<tr>
<td>3JK09</td>
<td>Med-cr sgrained gray vitreous quartzite clast in lower diamictite Oxford ridge, Clifton quad</td>
<td>12T 0412816</td>
<td>4674116</td>
</tr>
<tr>
<td>24JK09</td>
<td>Portion of granite boulder from extrabasinal diamictite below Tertiary intrusion, from base of ledge</td>
<td>12T 0413303</td>
<td>4672991</td>
</tr>
<tr>
<td>65JK09</td>
<td>Quartzite clasts from the cobble conglomerate of Oxford ridge, large drainage SW of Oxford</td>
<td>12T 0413250</td>
<td>4676294</td>
</tr>
<tr>
<td>67JK09</td>
<td>Stratified volcanic diamictite and sandstone, stratigraphically below Oxford Mt tuffite.</td>
<td>12T 0412964</td>
<td>4673869</td>
</tr>
<tr>
<td>68JK09</td>
<td>Volcanic sandstone just below Oxford Ridge crest, east face, quartzite and volc. clasts.</td>
<td>12T 0412359</td>
<td>4674549</td>
</tr>
<tr>
<td>73JK09</td>
<td>Stratigraphically highest diamictite below detachment. brown sandy matrix w/ quartzite and volcanic clasts. Fivemile Canyon</td>
<td>12T 0413735</td>
<td>4665127</td>
</tr>
<tr>
<td>74JK09</td>
<td>Gray vitreous med-grained quartz arenite boulder in lowest exposed diamictite Fivemile Cyn.</td>
<td>12T 0415004</td>
<td>4662210</td>
</tr>
<tr>
<td>75JK09</td>
<td>Lowest exposed diamictite in Fivemile Canyon by road, non-laminated, clast rich, green matrix, brown weathering</td>
<td>12T 0415005</td>
<td>4662210</td>
</tr>
<tr>
<td>Elevation (ft)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7294</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6435</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6060</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7700</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5300</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE DR1: SUMMARY OF LA-MC-ICPMS U-Pb DETRITAL ZIRCON ISOTOPIC DATA

<table>
<thead>
<tr>
<th>Sample</th>
<th>206Pb/238U * (%)</th>
<th>207Pb/235U * (%)</th>
<th>208Pb/232U * (%)</th>
<th>206Pb/204Pb corr.</th>
<th>207Pb/206Pb corr.</th>
<th>208Pb/204Pb corr.</th>
<th>208Pb/206Pb corr.</th>
<th>208Pb/204Pb corr.</th>
<th>208Pb/204Pb corr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>113</td>
<td>0.2651</td>
<td>1.4</td>
<td>4.6634</td>
<td>2.2</td>
<td>3.0328</td>
<td>1.7</td>
<td>0.77</td>
<td>1723.6</td>
<td>26.0</td>
</tr>
<tr>
<td>120</td>
<td>0.2651</td>
<td>1.4</td>
<td>4.6634</td>
<td>2.2</td>
<td>3.0328</td>
<td>1.7</td>
<td>0.77</td>
<td>1723.6</td>
<td>26.0</td>
</tr>
<tr>
<td>179</td>
<td>0.1684</td>
<td>0.9</td>
<td>3.7143</td>
<td>1.6</td>
<td>2.8718</td>
<td>1.4</td>
<td>0.70</td>
<td>1672.8</td>
<td>17.0</td>
</tr>
<tr>
<td>391</td>
<td>0.2038</td>
<td>1.1</td>
<td>4.9858</td>
<td>2.0</td>
<td>3.9634</td>
<td>1.6</td>
<td>0.77</td>
<td>1743.9</td>
<td>29.3</td>
</tr>
<tr>
<td>439</td>
<td>0.192077</td>
<td>1.2</td>
<td>3.0388</td>
<td>1.7</td>
<td>2.4283</td>
<td>1.0</td>
<td>0.53</td>
<td>2036.8</td>
<td>11.0</td>
</tr>
<tr>
<td>245</td>
<td>0.2063</td>
<td>1.1</td>
<td>4.9858</td>
<td>2.0</td>
<td>3.9634</td>
<td>1.6</td>
<td>0.77</td>
<td>1743.9</td>
<td>29.3</td>
</tr>
<tr>
<td>280</td>
<td>0.218673</td>
<td>1.3</td>
<td>4.6634</td>
<td>2.2</td>
<td>3.0328</td>
<td>1.7</td>
<td>0.77</td>
<td>1723.6</td>
<td>26.0</td>
</tr>
<tr>
<td>282</td>
<td>0.2038</td>
<td>1.1</td>
<td>4.9858</td>
<td>2.0</td>
<td>3.9634</td>
<td>1.6</td>
<td>0.77</td>
<td>1743.9</td>
<td>29.3</td>
</tr>
<tr>
<td>110</td>
<td>0.2239</td>
<td>1.0</td>
<td>4.6634</td>
<td>2.2</td>
<td>3.0328</td>
<td>1.7</td>
<td>0.77</td>
<td>1723.6</td>
<td>26.0</td>
</tr>
</tbody>
</table>

#### Notes
- Entries marked with an asterisk (*) indicate uncertain age determinations due to low confidence in the isotopic ratios.
- The uncertainty in age determinations is typically ±2 Ma, with the exception of samples with extremely low or high 206Pb/238U ratios, where uncertainties can be larger or smaller.
- The 206Pb/238U ratios are corrected for the 206Pb/204Pb contribution from the non-zircon matrix.
<table>
<thead>
<tr>
<th>Sample</th>
<th>ppm</th>
<th>204Pb (%)</th>
<th>207Pb (%)</th>
<th>206Pb (%)</th>
<th>208Pb (%)</th>
<th>203Pb (%)</th>
<th>209Pb (%)</th>
<th>210Pb (%)</th>
<th>224Pb (%)</th>
<th>234U (%)</th>
<th>235U (%)</th>
<th>238U (%)</th>
<th>corr. 238U (Ma)</th>
<th>235U (Ma)</th>
<th>corr. 235U (Ma)</th>
<th>207Pb (Ma)</th>
<th>corr. 207Pb (Ma)</th>
<th>206Pb (Ma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>2098</td>
<td>29.6567</td>
<td>2.7</td>
<td>15.7723</td>
<td>0.2</td>
<td>0.0672</td>
<td>2.6</td>
<td>0.1581</td>
<td>2.5</td>
<td>1.360</td>
<td>444.4</td>
<td>15.6</td>
<td>608.6</td>
<td>12.4</td>
<td>684.3</td>
<td>4.6</td>
<td>644.3</td>
<td>15.6</td>
</tr>
<tr>
<td>106</td>
<td>2098</td>
<td>29.6567</td>
<td>2.6</td>
<td>15.0000</td>
<td>0.2</td>
<td>0.0672</td>
<td>2.6</td>
<td>0.1581</td>
<td>2.5</td>
<td>1.360</td>
<td>444.4</td>
<td>15.6</td>
<td>608.6</td>
<td>12.4</td>
<td>684.3</td>
<td>4.6</td>
<td>644.3</td>
<td>15.6</td>
</tr>
<tr>
<td>88</td>
<td>2098</td>
<td>29.6567</td>
<td>2.3</td>
<td>14.8128</td>
<td>0.2</td>
<td>0.0672</td>
<td>2.6</td>
<td>0.1581</td>
<td>2.5</td>
<td>1.360</td>
<td>444.4</td>
<td>15.6</td>
<td>608.6</td>
<td>12.4</td>
<td>684.3</td>
<td>4.6</td>
<td>644.3</td>
<td>15.6</td>
</tr>
<tr>
<td>69</td>
<td>2098</td>
<td>29.6567</td>
<td>2.0</td>
<td>14.4912</td>
<td>0.2</td>
<td>0.0672</td>
<td>2.6</td>
<td>0.1581</td>
<td>2.5</td>
<td>1.360</td>
<td>444.4</td>
<td>15.6</td>
<td>608.6</td>
<td>12.4</td>
<td>684.3</td>
<td>4.6</td>
<td>644.3</td>
<td>15.6</td>
</tr>
<tr>
<td>50</td>
<td>2098</td>
<td>29.6567</td>
<td>1.7</td>
<td>14.1388</td>
<td>0.2</td>
<td>0.0672</td>
<td>2.6</td>
<td>0.1581</td>
<td>2.5</td>
<td>1.360</td>
<td>444.4</td>
<td>15.6</td>
<td>608.6</td>
<td>12.4</td>
<td>684.3</td>
<td>4.6</td>
<td>644.3</td>
<td>15.6</td>
</tr>
<tr>
<td>31</td>
<td>2098</td>
<td>29.6567</td>
<td>1.4</td>
<td>14.0349</td>
<td>0.2</td>
<td>0.0672</td>
<td>2.6</td>
<td>0.1581</td>
<td>2.5</td>
<td>1.360</td>
<td>444.4</td>
<td>15.6</td>
<td>608.6</td>
<td>12.4</td>
<td>684.3</td>
<td>4.6</td>
<td>644.3</td>
<td>15.6</td>
</tr>
<tr>
<td>11</td>
<td>2098</td>
<td>29.6567</td>
<td>1.1</td>
<td>13.7239</td>
<td>0.2</td>
<td>0.0672</td>
<td>2.6</td>
<td>0.1581</td>
<td>2.5</td>
<td>1.360</td>
<td>444.4</td>
<td>15.6</td>
<td>608.6</td>
<td>12.4</td>
<td>684.3</td>
<td>4.6</td>
<td>644.3</td>
<td>15.6</td>
</tr>
</tbody>
</table>

**TABLE DR1 (CONTINUED): SUMMARY OF LA-MC-ICPMS U-Pb DETRITAL ZIRCON ISOTOPIC DATA**
<table>
<thead>
<tr>
<th>Sample</th>
<th>204Pb/206Pb (%)</th>
<th>207Pb/206Pb (%)</th>
<th>208Pb/206Pb (%)</th>
<th>235U* (%)</th>
<th>238U (%)</th>
<th>corr. 238U* (Ma)</th>
<th>235U (Ma)</th>
<th>207Pb* (Ma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>1.7</td>
<td>5.9752</td>
<td>0.5</td>
<td>10.9355</td>
<td>2.0</td>
<td>0.4739</td>
<td>1.9</td>
<td>0.96</td>
</tr>
<tr>
<td>53</td>
<td>2.4</td>
<td>9.1861</td>
<td>0.9</td>
<td>4.7627</td>
<td>2.2</td>
<td>0.3173</td>
<td>2.0</td>
<td>0.92</td>
</tr>
<tr>
<td>45</td>
<td>2.9</td>
<td>9.4457</td>
<td>0.8</td>
<td>4.3544</td>
<td>1.9</td>
<td>0.2983</td>
<td>1.7</td>
<td>0.91</td>
</tr>
<tr>
<td>31</td>
<td>2.3</td>
<td>9.5315</td>
<td>1.0</td>
<td>4.2678</td>
<td>1.8</td>
<td>0.2950</td>
<td>1.5</td>
<td>0.91</td>
</tr>
<tr>
<td>50</td>
<td>1.2</td>
<td>9.5718</td>
<td>1.7</td>
<td>4.3232</td>
<td>2.7</td>
<td>0.3001</td>
<td>2.0</td>
<td>0.75</td>
</tr>
<tr>
<td>29</td>
<td>1.9</td>
<td>9.7076</td>
<td>0.6</td>
<td>4.1462</td>
<td>1.6</td>
<td>0.2919</td>
<td>1.4</td>
<td>0.92</td>
</tr>
<tr>
<td>34</td>
<td>2.3</td>
<td>9.7329</td>
<td>2.3</td>
<td>4.1704</td>
<td>2.7</td>
<td>0.2944</td>
<td>1.4</td>
<td>0.51</td>
</tr>
<tr>
<td>55</td>
<td>5.6</td>
<td>10.9352</td>
<td>2.7</td>
<td>3.1341</td>
<td>3.9</td>
<td>0.2486</td>
<td>2.9</td>
<td>0.73</td>
</tr>
<tr>
<td>27</td>
<td>2.7</td>
<td>11.3115</td>
<td>1.0</td>
<td>2.8669</td>
<td>3.7</td>
<td>0.2352</td>
<td>3.6</td>
<td>0.96</td>
</tr>
<tr>
<td>57</td>
<td>1.5</td>
<td>11.4604</td>
<td>3.7</td>
<td>2.8437</td>
<td>4.4</td>
<td>0.2364</td>
<td>2.4</td>
<td>0.54</td>
</tr>
<tr>
<td>11</td>
<td>1.2</td>
<td>13.0056</td>
<td>1.3</td>
<td>1.8250</td>
<td>4.1</td>
<td>0.1721</td>
<td>3.9</td>
<td>0.94</td>
</tr>
<tr>
<td>7</td>
<td>2.2</td>
<td>15.4774</td>
<td>3.6</td>
<td>1.0488</td>
<td>4.1</td>
<td>0.3143</td>
<td>3.7</td>
<td>0.92</td>
</tr>
<tr>
<td>37</td>
<td>2.5</td>
<td>15.5381</td>
<td>2.9</td>
<td>0.9886</td>
<td>3.3</td>
<td>0.3114</td>
<td>1.6</td>
<td>0.49</td>
</tr>
<tr>
<td>76</td>
<td>3.6</td>
<td>8.9985</td>
<td>0.6</td>
<td>4.9412</td>
<td>0.8</td>
<td>0.3235</td>
<td>0.8</td>
<td>0.75</td>
</tr>
<tr>
<td>97</td>
<td>4.7</td>
<td>9.3530</td>
<td>0.7</td>
<td>4.1482</td>
<td>4.1</td>
<td>0.2814</td>
<td>4.0</td>
<td>0.98</td>
</tr>
<tr>
<td>79</td>
<td>4.7</td>
<td>9.4345</td>
<td>0.4</td>
<td>4.5957</td>
<td>1.8</td>
<td>0.3145</td>
<td>1.8</td>
<td>0.98</td>
</tr>
<tr>
<td>96</td>
<td>6.4</td>
<td>9.6862</td>
<td>0.7</td>
<td>4.4490</td>
<td>3.9</td>
<td>0.2932</td>
<td>3.2</td>
<td>0.91</td>
</tr>
<tr>
<td>52</td>
<td>3.9</td>
<td>9.7542</td>
<td>1.3</td>
<td>0.9886</td>
<td>3.3</td>
<td>0.3114</td>
<td>1.6</td>
<td>0.49</td>
</tr>
<tr>
<td>100</td>
<td>4.4</td>
<td>9.8067</td>
<td>0.6</td>
<td>4.3468</td>
<td>3.9</td>
<td>0.2932</td>
<td>3.2</td>
<td>0.91</td>
</tr>
<tr>
<td>31</td>
<td>2.9</td>
<td>10.2135</td>
<td>1.6</td>
<td>0.9886</td>
<td>3.3</td>
<td>0.3114</td>
<td>1.6</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Notes:
1. Analyses with 10% uncertainty (1 sigma) in 207Pb/206Pb age are not included.
2. 206Pb age is determined from 204Pb/206Pb age for each sample and from 206Pb/207Pb age for analyses with 207Pb/206Pb = 1.000.
3. Concrastence is based on 208Pb/206Pb Age. Value is reported for 208Pb/206Pb age = 206Pb age because of large uncertainty in 208Pb/206Pb age.
4. Analyses with 208Pb/206Pb > 0.55 and with > 10% discordance of 206Pb ages are not included.
5. Analyses with 208Pb/206Pb > 0.55 and with > 10% discordance of 206Pb ages are not included.
6. 206Pb ages are reported at the level of accuracy and include only measurement uncertainty.
7. Analytical errors band (2 sigma) (ppm) = [2 + 0.5*206Pb/207Pb + 1.4 + 0.5*207Pb/206Pb]. These values are reported on both 206Pb/207Pb and 207Pb/206Pb.
8. U-Pb ages determined using the 204Pb/206Pb and 207Pb/206Pb isochrons. All uncertainties are 2 sigma.
9. Common Pb correction is unmeasured 204Pb/206Pb and 207Pb/206Pb from U-Ton 206Pb/207Pb data.
10. Common Pb correction is based on 204Pb/206Pb = 0.000 for 206Pb/207Pb, 3.52 for 207Pb/206Pb, and 2.85 for 208Pb/206Pb and 206Pb/207Pb.
11. 10% and 20% uncertainty (1 and 2 sigma) in 207Pb/206Pb are indicated in parentheses.
12. 10% and 20% uncertainty (1 and 2 sigma) in 207Pb/206Pb are indicated in parentheses.
13. 10% and 20% uncertainty (1 and 2 sigma) in 207Pb/206Pb are indicated in parentheses.
14. 10% and 20% uncertainty (1 and 2 sigma) in 207Pb/206Pb are indicated in parentheses.
15. 10% and 20% uncertainty (1 and 2 sigma) in 207Pb/206Pb are indicated in parentheses.
<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Analysis</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>06PL00</td>
<td>SHRIMP &amp; CA-ID-TIMS</td>
<td>12T 0412893 4674064 7200</td>
<td>Crystal-rich volcaniclastic rock on Oxford Ridge</td>
</tr>
<tr>
<td>34PL05</td>
<td>CA-ID-TIMS</td>
<td>12T 0412962 4673861 7170</td>
<td>Crystal-rich volcaniclastic rock on Oxford Ridge</td>
</tr>
<tr>
<td>15PL08</td>
<td>SHRIMP</td>
<td>12T 0369147 4737317 5426</td>
<td>Plagioclase arkose immediately above lower diamictite at Portneuf Narrows</td>
</tr>
<tr>
<td>03JK09</td>
<td>LA-MC-ICPMS</td>
<td>12T 0412816 4674116 7294</td>
<td>Medium- to coarse-grained gray quartzite clast</td>
</tr>
<tr>
<td>04JK09</td>
<td>SHRIMP &amp; CA-ID-TIMS</td>
<td>12T 0412979 4673877 7120</td>
<td>Crudely-stratified volcaniclastic diamictite above wavy laminations</td>
</tr>
<tr>
<td>24JK09</td>
<td>LA-MC-ICPMS</td>
<td>12T 0413303 4672991 6435</td>
<td>Granite boulder from extrabasinal diamictite below Tertiary intrusion</td>
</tr>
<tr>
<td>62JK09</td>
<td>SHRIMP</td>
<td>12T 0388782 4738116 4690</td>
<td>Lowest diamictite. Portneuf Narrows</td>
</tr>
<tr>
<td>63JK09</td>
<td>SHRIMP</td>
<td>12T 0388950 4738116 5090</td>
<td>Lower diamictite at 100m, Portneuf Narrows</td>
</tr>
<tr>
<td>64JK09</td>
<td>SHRIMP</td>
<td>12T 0381013 4746937 5500</td>
<td>Purple Rhyolite clast from cobble cong mb., Ft Hall Mine section, Portneuf Narrows</td>
</tr>
<tr>
<td>68JK09</td>
<td>LA-MC-ICPMS</td>
<td>12T 0412359 4674549 5700</td>
<td>Stratigraphically highest diamictite below Clifton fault, Fivemile Canyon</td>
</tr>
<tr>
<td>74JK09</td>
<td>LA-MC-ICPMS</td>
<td>12T 0415004 4662210 5300</td>
<td>Gray vitreous medium-grained quartz arenite boulder in lowest exposed diamictite Fivemile Canyon.</td>
</tr>
<tr>
<td>75JK09</td>
<td>LA-MC-ICPMS</td>
<td>12T 0415005 4662210 5300</td>
<td>Lowest exposed diamictite in Fivemile Canyon</td>
</tr>
<tr>
<td>13JK10</td>
<td>CA-ID-TIMS</td>
<td>12T 0412160 4672760 7620</td>
<td>Laminated tuffe with pyroclasts and epiclasts depressing laminations</td>
</tr>
<tr>
<td>15JK10</td>
<td>CA-ID-TIMS</td>
<td>12T 0411780 4677607 7000</td>
<td>Non-stratified volcaniclastic diamictite</td>
</tr>
<tr>
<td>16JK10</td>
<td>CA-ID-TIMS</td>
<td>12T 0410413 4678523 8640</td>
<td>Crudely-stratified volcaniclastic diamictite with thin wavy laminations</td>
</tr>
<tr>
<td>17JK10</td>
<td>CA-ID-TIMS</td>
<td>12T 0410413 4678523 8640</td>
<td>Trachyte clast in non-stratified volcaniclastic diamictite</td>
</tr>
<tr>
<td>19JK10</td>
<td>CA-ID-TIMS</td>
<td>12T 0411739 4677978 7780</td>
<td>Trachyte clast in non-stratified volcaniclastic diamictite</td>
</tr>
<tr>
<td>23JK10</td>
<td>CA-ID-TIMS</td>
<td>12T 0412979 4673877 7120</td>
<td>Crudely-stratified volcaniclastic diamictite with thin wavy laminations</td>
</tr>
</tbody>
</table>
Concordia Age = 701.8 ± 5.1 Ma
(95% confidence, decay-const.
errs included)

Concordia Age = 704.9 ± 5.1 Ma
(95% confidence, decay-const.
errs included)

Concordia Age = 703.6 ± 4.8 Ma
(95% confidence, decay-const.
errs included)

Concordia Age = 681.5 ± 3.6 Ma
(95% confidence, decay-const.
errs included)

MSWD (of concordance) = 0.100,
Probability (of concordance) = 0.75

MSWD (of concordance) = 0.63,
Probability (of concordance) = 0.43

MSWD (of concordance) = 0.72,
Probability (of concordance) = 0.40

MSWD (of concordance) = 2.4,
Probability (of concordance) = 0.12

data-point error ellipses
are 68.3% confidence
Concordia Age = 689.4 ±3.9 Ma
(95% confidence, decay-const. errors included)

MSWD (of concordance) = 7.3,
Probability (of concordance) = 0.007

data-point error ellipses are 68.3% confidence