**[Supplementary material]**

**Obsidian Procurement and Exchange at the Apogee of Empire: Wari Political Economy in Arequipa, Peru**

David A. Reid1\*, Patrick Ryan Williams2, Augusto Cardona Rosas3, Robin Coleman Goldstein4, Laure Dussubieux5, Cyrus Banikazemi1, and Kurt Rademaker6

1 Department of Anthropology, University of Illinois – Chicago, 1007 West Harrison Street, Chicago, Illinois 60607-7139, USA

2Arizona State University, School of Human Evolution and Social Change, 900 S. Cady Mall, Tempe, AZ 85284, USA

3Centro de Investigaciones Arqueológicas de Arequipa (CIARQ), Arequipa, Peru

4 Department of Anthropology, Northwestern University, 1810 Hinman Avenue, Evanston, IL 60208, USA

5 The Field Museum of Natural History, 1400 S Lake Shore Dr, Chicago, IL 60605, USA

6 Department of Anthropology, Michigan State University, 655 Auditorium Drive, East Lansing, MI 48824, USA

\* Author for correspondence: [dreid5@uic.edu](file:///C:\Users\GIS%20Workstation%201\Documents\PeruFiles\Publications\03%20Arequipa%20obsidian\dreid5@uic.edu)

**Supplemental Table 3. LA-ICP-MS elemental concentrations (ppm) of obsidian artifacts from Arequipa study sites.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Site** | **Sample ID** | **Source** | **Ba** | **Be** | **B** | **Sc** | **Ti** | **V** | **Zn** | **Rb** | **Sr** | **Zr** | **Nb** | **Cs** | **La** | **Ce** | **Pr** |
| Atitirca | ATP101 | Alca-1 | 950.5 | 2.5 | 18.7 | 2.1 | 731.3 | 3.1 | 41.6 | 165.8 | 83.7 | 86.2 | 14.0 | 3.3 | 28.6 | 58.4 | 6.6 |
| Atitirca | ATP102 | Alca-1 | 851.8 | 2.0 | 21.8 | 1.9 | 646.0 | 2.4 | 39.4 | 132.1 | 69.5 | 71.2 | 11.5 | 2.5 | 24.9 | 49.6 | 5.4 |
| Atitirca | ATP103 | Alca-4 | 992.2 | 2.6 | 33.5 | 2.1 | 689.3 | 2.9 | 42.7 | 127.7 | 140.7 | 79.2 | 10.5 | 3.1 | 24.9 | 48.0 | 5.5 |
| Atitirca | ATP104 | Alca-1 | 954.7 | 2.7 | 19.6 | 2.0 | 690.2 | 2.7 | 39.3 | 147.3 | 79.2 | 79.2 | 12.7 | 2.9 | 29.0 | 58.7 | 6.6 |
| Atitirca | ATP105 | Alca-1 | 900.1 | 2.6 | 18.7 | 1.9 | 685.2 | 2.8 | 43.4 | 151.0 | 77.9 | 72.5 | 12.4 | 3.0 | 27.0 | 55.7 | 6.2 |
| Huamantambo | HMT101 | Alca-1 | 863.1 | 2.8 | 21.2 | 2.0 | 695.9 | 3.2 | 41.7 | 137.7 | 71.6 | 74.3 | 13.4 | 3.2 | 26.2 | 53.7 | 5.6 |
| Huamantambo | HMT102 | Alca-1 | 832.4 | 2.5 | 23.6 | 1.7 | 640.4 | 2.4 | 37.4 | 130.1 | 68.4 | 69.6 | 11.2 | 2.5 | 24.5 | 48.8 | 5.4 |
| Huamantambo | HMT103 | Alca-4 | 916.2 | 2.3 | 32.9 | 2.1 | 665.5 | 2.9 | 30.2 | 111.4 | 132.5 | 74.9 | 10.8 | 2.6 | 23.5 | 44.7 | 4.8 |
| Huamantambo | HMT104 | Alca-1 | 823.4 | 2.4 | 16.7 | 1.8 | 634.2 | 2.3 | 35.4 | 131.6 | 67.0 | 71.0 | 12.4 | 2.7 | 25.1 | 50.5 | 5.4 |
| Huamantambo | HMT105 | Alca-1 | 848.0 | 2.4 | 21.5 | 1.7 | 636.1 | 2.2 | 37.6 | 134.1 | 70.3 | 72.1 | 11.5 | 2.5 | 24.5 | 49.3 | 5.5 |
| Huamantambo | HMT106 | Alca-1 | 795.9 | 2.2 | 27.1 | 2.1 | 686.6 | 2.7 | 42.2 | 151.3 | 79.4 | 73.1 | 12.2 | 2.7 | 27.3 | 52.5 | 5.6 |
| Huamantambo | HMT107 | Alca-1 | 897.3 | 2.6 | 23.4 | 1.9 | 654.4 | 2.3 | 38.9 | 139.1 | 73.3 | 75.6 | 11.9 | 2.6 | 26.8 | 54.0 | 6.0 |
| Huamantambo | HMT108 | Alca-1 | 909.7 | 3.2 | 23.1 | 1.9 | 674.2 | 2.6 | 36.5 | 144.0 | 73.6 | 76.7 | 12.3 | 2.9 | 27.3 | 54.1 | 6.1 |
| Huamantambo | HMT109 | Alca-1 | 864.4 | 2.4 | 20.9 | 1.8 | 648.8 | 2.5 | 41.0 | 134.3 | 71.2 | 72.0 | 11.7 | 2.7 | 25.7 | 51.2 | 5.8 |
| Huamantambo | HMT110 | Alca-1 | 900.0 | 1.9 | 18.8 | 1.9 | 662.0 | 2.4 | 39.8 | 140.5 | 72.8 | 73.3 | 12.2 | 3.0 | 26.4 | 54.9 | 6.2 |
| Huamantambo | HMT111 | Alca-1 | 882.3 | 2.4 | 21.2 | 1.8 | 645.4 | 2.4 | 35.9 | 136.9 | 71.2 | 72.2 | 11.7 | 2.7 | 25.7 | 51.8 | 5.8 |
| Huamantambo | HMT112 | Alca-1 | 917.9 | 2.8 | 20.0 | 1.9 | 657.4 | 2.5 | 38.9 | 140.9 | 75.6 | 77.8 | 12.4 | 2.9 | 26.8 | 54.0 | 6.0 |
| Huamantambo | HMT113 | Alca-1 | 864.2 | 2.1 | 19.2 | 1.9 | 646.8 | 3.0 | 37.7 | 138.4 | 71.9 | 78.5 | 12.6 | 2.8 | 27.4 | 55.0 | 5.7 |
| Huamantambo | HMT114 | Quispisisa | 599.5 | 2.1 | 101.3 | 1.6 | 669.2 | 4.1 | 25.2 | 176.9 | 110.7 | 77.3 | 11.5 | 10.2 | 24.7 | 46.4 | 4.7 |
| Huamantambo | HMT115 | Alca-1 | 834.0 | 1.9 | 18.5 | 1.8 | 625.0 | 2.4 | 39.4 | 135.0 | 65.9 | 71.2 | 12.6 | 2.6 | 25.6 | 51.8 | 5.4 |
| Huamantambo | HMT116 | Alca-1 | 839.6 | 2.4 | 17.9 | 1.9 | 644.7 | 2.8 | 37.1 | 132.1 | 67.6 | 72.4 | 12.6 | 2.7 | 25.7 | 51.7 | 5.5 |
| Huamantambo | HMT117 | Alca-1 | 897.8 | 2.5 | 20.2 | 2.1 | 710.8 | 3.2 | 44.4 | 137.1 | 72.2 | 76.0 | 13.1 | 3.0 | 27.4 | 54.7 | 5.9 |
| Huamantambo | HMT118 | Alca-1 | 873.9 | 2.4 | 17.6 | 1.9 | 647.3 | 2.6 | 36.6 | 136.1 | 69.6 | 73.8 | 12.8 | 2.7 | 26.6 | 53.2 | 5.6 |
| La Angostura | 02-03-0001 | Quispisisa | 565.3 | 2.1 | 90.8 | 2.8 | 706.0 | 3.6 | 29.7 | 142.7 | 89.2 | 68.7 | 9.1 | 9.0 | 20.5 | 39.3 | 4.0 |
| La Angostura | 02-04-0002 | Alca-4 | 900.0 | 2.0 | 20.5 | 3.1 | 671.0 | 3.3 | 36.6 | 89.6 | 128.7 | 70.1 | 8.4 | 2.1 | 24.2 | 47.6 | 5.1 |
| La Angostura | 02-06-0006 | Quispisisa | 583.0 | 2.3 | 95.5 | 2.8 | 709.4 | 3.7 | 29.5 | 143.5 | 92.4 | 69.4 | 9.1 | 9.2 | 21.6 | 40.1 | 4.2 |
| La Angostura | 02-07-0010 | Alca-4 | 897.5 | 2.0 | 20.6 | 3.1 | 701.8 | 3.6 | 32.6 | 88.2 | 135.8 | 66.3 | 8.2 | 2.1 | 23.4 | 46.2 | 5.0 |
| La Angostura | 02-07-0014 | Alca-4 | 926.1 | 2.0 | 20.7 | 3.1 | 752.4 | 4.9 | 36.7 | 88.1 | 114.7 | 66.3 | 8.3 | 2.1 | 23.9 | 47.0 | 5.1 |
| La Angostura | 02-07-0016a | Alca-4 | 851.3 | 1.8 | 20.8 | 2.9 | 664.1 | 3.5 | 35.3 | 85.1 | 125.1 | 56.6 | 8.1 | 2.1 | 20.1 | 44.2 | 4.4 |
| La Angostura | 02-07-0016b | Alca-4 | 763.3 | 1.8 | 21.8 | 2.9 | 664.6 | 3.9 | 37.6 | 90.6 | 97.5 | 49.0 | 7.9 | 2.2 | 18.0 | 42.3 | 4.1 |
| La Angostura | 02-07-0020 | Alca-4 | 879.5 | 2.0 | 26.5 | 3.1 | 679.9 | 2.7 | 35.1 | 88.7 | 105.2 | 65.2 | 8.3 | 2.3 | 19.5 | 38.1 | 4.1 |
| Número 8 | No8101 | Alca-1 | 874.2 | 3.0 | 19.4 | 1.9 | 664.2 | 2.7 | 40.6 | 134.0 | 73.1 | 73.1 | 12.8 | 2.7 | 26.5 | 53.4 | 5.6 |
| Número 8 | No8102 | Alca-1 | 807.0 | 2.1 | 24.1 | 2.0 | 676.6 | 2.6 | 41.6 | 149.6 | 82.5 | 74.5 | 11.9 | 2.7 | 27.8 | 53.2 | 5.7 |
| Número 8 | No8103 | Alca-1 | 809.3 | 2.4 | 17.8 | 2.1 | 672.1 | 5.3 | 36.9 | 141.8 | 66.6 | 71.3 | 12.8 | 2.5 | 24.9 | 50.4 | 5.4 |
| Número 8 | No8104 | Alca-1 | 840.5 | 2.7 | 18.8 | 1.9 | 649.3 | 2.7 | 38.3 | 136.1 | 65.7 | 70.4 | 12.9 | 2.6 | 25.0 | 51.4 | 5.3 |
| Número 8 | No8105 | Alca-1 | 874.2 | 3.0 | 19.4 | 1.9 | 664.2 | 2.7 | 40.6 | 134.0 | 73.1 | 73.1 | 12.8 | 2.7 | 26.5 | 53.4 | 5.6 |
| Pakaytambo | 03-03-0001 | Alca-1 | 841.8 | 2.3 | 15.9 | 3.0 | 690.1 | 2.2 | 41.7 | 112.8 | 57.2 | 67.3 | 10.3 | 2.3 | 22.6 | 45.7 | 4.9 |
| Pakaytambo | 03-03-0003 | Alca-1 | 859.4 | 2.3 | 16.5 | 3.0 | 670.9 | 2.2 | 40.5 | 111.4 | 57.4 | 68.5 | 10.2 | 2.4 | 23.3 | 46.8 | 5.1 |
| Pakaytambo | 03-07-0007 | Alca-1 | 767.6 | 9.9 | 27.7 | 4.8 | 683.7 | 3.7 | 41.3 | 120.0 | 49.3 | 53.0 | 10.5 | 3.1 | 18.4 | 43.1 | 4.2 |
| Pakaytambo | 03-07-0009 | Alca-4 | 896.4 | 2.0 | 20.4 | 4.5 | 683.1 | 3.5 | 34.5 | 85.2 | 117.1 | 66.9 | 8.2 | 2.1 | 23.6 | 45.8 | 4.9 |
| Pakaytambo | 03-07-0059 | Alca-1 | 837.3 | 2.3 | 16.8 | 2.9 | 682.1 | 2.3 | 43.5 | 110.7 | 55.1 | 64.0 | 10.2 | 2.3 | 22.1 | 46.2 | 5.0 |
| Pascuita | PAS101 | Alca-1 | 861.7 | 2.3 | 19.1 | 1.9 | 656.2 | 2.4 | 38.8 | 134.3 | 69.1 | 73.5 | 13.0 | 2.6 | 26.1 | 52.5 | 5.6 |
| Qosqospa | QOS101 | Alca-1 | 765.5 | 2.0 | 22.9 | 1.8 | 571.1 | 2.4 | 42.6 | 132.7 | 74.3 | 70.3 | 11.4 | 2.6 | 27.4 | 51.2 | 5.4 |
| Qosqospa | QOS102 | Alca-1 | 825.0 | 2.0 | 21.0 | 1.9 | 644.6 | 2.6 | 40.7 | 140.2 | 78.6 | 71.3 | 11.8 | 2.7 | 28.5 | 54.2 | 5.7 |
| Qosqospa | QOS103 | Alca-1 | 866.2 | 2.2 | 25.4 | 1.9 | 636.6 | 2.4 | 38.9 | 142.3 | 78.6 | 72.1 | 12.0 | 2.8 | 29.4 | 56.8 | 6.0 |
| Qosqospa | QOS104 | Alca-1 | 801.3 | 2.0 | 21.7 | 2.0 | 641.9 | 2.5 | 37.0 | 143.1 | 75.6 | 69.7 | 11.6 | 2.7 | 27.4 | 52.6 | 5.5 |
| Qosqospa | QOS105 | Alca-1 | 790.8 | 1.8 | 22.5 | 2.0 | 634.3 | 2.5 | 42.9 | 144.8 | 77.1 | 70.9 | 11.7 | 2.6 | 27.3 | 51.7 | 5.4 |
| Qosqospa | QOS106 | Alca-1 | 815.3 | 2.0 | 19.7 | 2.0 | 637.3 | 2.5 | 37.4 | 139.2 | 75.0 | 68.8 | 11.5 | 2.7 | 28.0 | 53.9 | 5.6 |
| Qosqospa | QOS107 | Alca-1 | 767.7 | 2.0 | 22.3 | 2.0 | 637.4 | 2.5 | 42.1 | 140.8 | 77.4 | 70.1 | 11.3 | 2.5 | 26.7 | 50.2 | 5.4 |
| Qosqospa | QOS108 | Quispisisa | 545.3 | 2.0 | 135.4 | 1.6 | 661.8 | 4.2 | 32.7 | 187.3 | 125.9 | 76.3 | 10.4 | 10.3 | 25.8 | 43.6 | 4.4 |
| Qosqospa | QOS109 | Alca-1 | 883.2 | 2.1 | 24.9 | 2.0 | 660.0 | 3.4 | 41.9 | 148.3 | 81.3 | 73.8 | 12.5 | 3.1 | 30.7 | 60.0 | 6.3 |
| Qosqospa | QOS110 | Alca-1 | 803.8 | 2.0 | 21.6 | 2.0 | 640.9 | 2.4 | 40.4 | 145.2 | 77.8 | 72.3 | 11.6 | 2.7 | 27.9 | 52.9 | 5.6 |
| Alca-1 geologic | KRA-065 | Alca-1 | 868.6 | 2.3 | 16.0 | 4.4 | 682.2 | 2.2 | 42.6 | 111.3 | 55.9 | 64.6 | 10.2 | 2.4 | 22.6 | 46.3 | 5.0 |
| Alca-2 geologic | KRA-003 | Alca-2 | 836.8 | 2.6 | 12.7 | 4.0 | 983.2 | 3.9 | 44.3 | 116.5 | 97.1 | 111.7 | 10.5 | 2.3 | 35.4 | 68.3 | 7.2 |
| Alca-3 geologic | KRA-012 | Alca-3 | 887.3 | 2.2 | 23.7 | 4.0 | 1012.2 | 4.6 | 46.1 | 104.6 | 154.2 | 110.7 | 9.5 | 2.9 | 28.9 | 56.0 | 6.1 |
| Alca-4 geologic | KRA-254 | Alca-4 | 879.3 | 1.9 | 27.3 | 4.1 | 643.7 | 2.6 | 35.2 | 85.4 | 99.1 | 59.0 | 7.9 | 2.3 | 18.9 | 38.2 | 4.1 |
| Alca-5 geologic | KRA-112 | Alca-5 | 883.6 | 2.4 | 15.6 | 4.1 | 589.5 | 1.4 | 39.1 | 102.8 | 75.9 | 59.9 | 9.4 | 2.3 | 25.2 | 49.4 | 5.4 |
| Alca-7 geologic | KRA-101 | Alca-7 | 672.3 | 2.4 | 31.7 | 4.2 | 532.7 | 2.8 | 30.2 | 130.4 | 96.0 | 54.2 | 9.7 | 4.0 | 24.1 | 45.0 | 4.7 |
| Anillo geologic | Anillo | Anillo | 821.4 | 2.4 | 17.9 | 3.1 | 707.1 | 2.8 | 40.1 | 148.1 | 104.0 | 96.4 | 11.9 | 3.6 | 34.3 | 65.0 | 6.9 |
| Chivay geologic | Q02002-1-1 | Chivay | 108.5 | 3.8 | 72.6 | 5.1 | 467.4 | 2.3 | 34.6 | 207.6 | 30.2 | 58.9 | 18.2 | 8.5 | 14.6 | 32.8 | 3.9 |
| Quispisisa geologic | 9007.2.4 | Quispisisa | 583.6 | 2.0 | 93.2 | 3.7 | 705.7 | 3.5 | 29.1 | 145.7 | 87.2 | 62.6 | 9.0 | 9.2 | 20.0 | 39.5 | 4.0 |

**Table S3 cont. LA-ICP-MS elemental concentrations (ppm) of obsidian artifacts from Arequipa study.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Site** | **Sample ID** | **Source** | **Y** | **U** | **Nd** | **Sm** | **Eu** | **Gd** | **Tb** | **Dy** | **Ho** | **Er** | **Tm** | **Yb** | **Lu** | **Hf** | **Th** |
| Atitirca | ATP101 | Alca-1 | 12.9 | 3.2 | 19.5 | 3.4 | 0.5 | 2.4 | 0.4 | 2.1 | 0.4 | 1.1 | 0.2 | 1.2 | 0.2 | 4.2 | 29.5 |
| Atitirca | ATP102 | Alca-1 | 10.3 | 3.7 | 17.4 | 3.0 | 0.5 | 2.1 | 0.3 | 2.0 | 0.4 | 0.9 | 0.1 | 1.0 | 0.2 | 3.2 | 12.4 |
| Atitirca | ATP103 | Alca-4 | 11.4 | 2.0 | 16.9 | 2.7 | 0.6 | 2.1 | 0.3 | 1.9 | 0.4 | 1.1 | 0.2 | 1.1 | 0.2 | 3.4 | 23.3 |
| Atitirca | ATP104 | Alca-1 | 11.7 | 4.2 | 20.5 | 3.7 | 0.5 | 2.5 | 0.4 | 2.2 | 0.5 | 1.2 | 0.2 | 1.1 | 0.2 | 3.8 | 13.9 |
| Atitirca | ATP105 | Alca-1 | 11.0 | 3.8 | 19.5 | 3.3 | 0.5 | 2.3 | 0.3 | 1.9 | 0.4 | 1.1 | 0.2 | 1.0 | 0.2 | 3.4 | 53.9 |
| Huamantambo | HMT101 | Alca-1 | 11.0 | 3.6 | 18.3 | 3.1 | 0.5 | 2.2 | 0.3 | 1.9 | 0.4 | 0.9 | 0.1 | 1.1 | 0.2 | 3.2 | 12.6 |
| Huamantambo | HMT102 | Alca-1 | 10.4 | 3.7 | 16.7 | 3.1 | 0.5 | 2.3 | 0.4 | 1.9 | 0.4 | 0.9 | 0.1 | 1.0 | 0.2 | 3.2 | 11.7 |
| Huamantambo | HMT103 | Alca-4 | 10.6 | 2.2 | 15.2 | 2.4 | 0.5 | 1.9 | 0.3 | 1.9 | 0.4 | 0.9 | 0.1 | 1.1 | 0.1 | 3.1 | 12.0 |
| Huamantambo | HMT104 | Alca-1 | 10.8 | 3.4 | 16.4 | 2.8 | 0.5 | 2.0 | 0.3 | 1.8 | 0.3 | 1.0 | 0.1 | 1.2 | 0.1 | 3.2 | 12.2 |
| Huamantambo | HMT105 | Alca-1 | 10.7 | 3.7 | 16.9 | 2.8 | 0.4 | 2.2 | 0.3 | 2.0 | 0.4 | 0.9 | 0.2 | 1.0 | 0.1 | 3.1 | 13.4 |
| Huamantambo | HMT106 | Alca-1 | 10.9 | 4.0 | 17.4 | 2.9 | 0.4 | 2.4 | 0.4 | 1.9 | 0.4 | 0.8 | 0.2 | 1.1 | 0.2 | 3.4 | 16.2 |
| Huamantambo | HMT107 | Alca-1 | 11.2 | 4.1 | 19.0 | 3.1 | 0.5 | 2.4 | 0.4 | 1.9 | 0.4 | 1.0 | 0.2 | 1.1 | 0.2 | 3.5 | 13.8 |
| Huamantambo | HMT108 | Alca-1 | 11.4 | 4.3 | 19.1 | 3.5 | 0.5 | 2.4 | 0.4 | 2.2 | 0.5 | 1.1 | 0.2 | 1.2 | 0.2 | 3.8 | 14.5 |
| Huamantambo | HMT109 | Alca-1 | 10.7 | 4.0 | 17.9 | 3.1 | 0.5 | 2.3 | 0.4 | 2.1 | 0.4 | 0.9 | 0.1 | 1.1 | 0.2 | 3.4 | 23.3 |
| Huamantambo | HMT110 | Alca-1 | 10.8 | 4.2 | 18.6 | 3.6 | 0.6 | 2.3 | 0.5 | 2.1 | 0.5 | 1.0 | 0.3 | 1.3 | 0.2 | 3.5 | 123.4 |
| Huamantambo | HMT111 | Alca-1 | 10.5 | 4.1 | 18.1 | 3.3 | 0.5 | 2.4 | 0.4 | 2.0 | 0.4 | 0.9 | 0.2 | 1.0 | 0.2 | 3.5 | 19.2 |
| Huamantambo | HMT112 | Alca-1 | 11.6 | 4.0 | 18.4 | 3.4 | 0.6 | 2.3 | 0.4 | 2.2 | 0.4 | 1.0 | 0.2 | 1.1 | 0.2 | 3.4 | 24.7 |
| Huamantambo | HMT113 | Alca-1 | 10.7 | 4.0 | 18.3 | 3.1 | 0.5 | 2.2 | 0.3 | 2.0 | 0.3 | 1.0 | 0.2 | 1.0 | 0.1 | 3.4 | 13.0 |
| Huamantambo | HMT114 | Quispisisa | 10.0 | 10.3 | 14.9 | 2.4 | 0.5 | 1.7 | 0.3 | 1.7 | 0.4 | 1.0 | 0.2 | 1.1 | 0.2 | 3.2 | 16.3 |
| Huamantambo | HMT115 | Alca-1 | 10.7 | 4.0 | 16.9 | 2.8 | 0.4 | 2.2 | 0.3 | 1.9 | 0.3 | 0.9 | 0.1 | 1.0 | 0.1 | 3.4 | 11.8 |
| Huamantambo | HMT116 | Alca-1 | 10.9 | 3.8 | 17.0 | 3.0 | 0.5 | 2.1 | 0.3 | 2.0 | 0.3 | 0.9 | 0.2 | 1.1 | 0.2 | 3.3 | 16.8 |
| Huamantambo | HMT117 | Alca-1 | 11.3 | 3.7 | 18.6 | 3.3 | 0.5 | 2.2 | 0.3 | 1.9 | 0.4 | 1.0 | 0.1 | 1.2 | 0.2 | 3.6 | 13.9 |
| Huamantambo | HMT118 | Alca-1 | 11.1 | 4.0 | 17.7 | 3.2 | 0.5 | 2.3 | 0.3 | 1.9 | 0.4 | 1.0 | 0.2 | 1.1 | 0.2 | 3.4 | 12.7 |
| La Angostura | 02-03-0001 | Quispisisa | 7.5 | 8.1 | 13.4 | 2.2 | 0.4 | 1.6 | 0.2 | 1.4 | 0.3 | 0.8 | 0.1 | 0.9 | 0.1 | 2.7 | 16.9 |
| La Angostura | 02-04-0002 | Alca-4 | 7.8 | 2.2 | 17.6 | 2.9 | 0.5 | 2.0 | 0.2 | 1.5 | 0.3 | 0.8 | 0.1 | 0.9 | 0.1 | 2.9 | 8.9 |
| La Angostura | 02-06-0006 | Quispisisa | 7.6 | 8.2 | 13.9 | 2.3 | 0.4 | 1.7 | 0.2 | 1.4 | 0.3 | 0.9 | 0.1 | 1.0 | 0.1 | 2.8 | 17.5 |
| La Angostura | 02-07-0010 | Alca-4 | 7.3 | 2.2 | 17.2 | 2.8 | 0.5 | 1.9 | 0.2 | 1.5 | 0.3 | 0.8 | 0.1 | 0.8 | 0.1 | 2.7 | 8.6 |
| La Angostura | 02-07-0014 | Alca-4 | 7.4 | 2.2 | 17.5 | 2.9 | 0.5 | 2.0 | 0.2 | 1.5 | 0.3 | 0.8 | 0.1 | 0.9 | 0.1 | 2.8 | 8.7 |
| La Angostura | 02-07-0016a | Alca-4 | 6.1 | 2.1 | 14.6 | 2.4 | 0.5 | 1.6 | 0.2 | 1.2 | 0.2 | 0.6 | 0.1 | 0.8 | 0.1 | 2.3 | 7.4 |
| La Angostura | 02-07-0016b | Alca-4 | 5.2 | 2.2 | 13.4 | 2.1 | 0.4 | 1.4 | 0.2 | 1.1 | 0.2 | 0.6 | 0.1 | 0.6 | 0.1 | 1.8 | 6.4 |
| La Angostura | 02-07-0020 | Alca-4 | 7.9 | 1.8 | 14.5 | 2.5 | 0.4 | 1.8 | 0.3 | 1.6 | 0.3 | 0.8 | 0.1 | 0.9 | 0.1 | 2.6 | 7.5 |
| Numero 8 | No8101 | Alca-1 | 10.7 | 3.7 | 17.5 | 3.2 | 0.5 | 2.2 | 0.3 | 1.8 | 0.4 | 0.9 | 0.2 | 1.2 | 0.2 | 3.3 | 12.6 |
| Numero 8 | No8102 | Alca-1 | 11.1 | 4.0 | 17.4 | 2.9 | 0.5 | 2.6 | 0.4 | 2.0 | 0.4 | 0.9 | 0.1 | 1.1 | 0.1 | 3.4 | 16.2 |
| Numero 8 | No8103 | Alca-1 | 10.5 | 3.4 | 16.4 | 2.9 | 0.5 | 2.0 | 0.3 | 1.9 | 0.3 | 1.0 | 0.2 | 1.1 | 0.2 | 3.3 | 12.9 |
| Numero 8 | No8104 | Alca-1 | 10.3 | 3.6 | 16.7 | 2.9 | 0.3 | 2.1 | 0.3 | 1.8 | 0.3 | 0.9 | 0.1 | 1.1 | 0.1 | 3.2 | 12.3 |
| Numero 8 | No8105 | Alca-1 | 10.7 | 3.7 | 17.5 | 3.2 | 0.5 | 2.2 | 0.3 | 1.8 | 0.4 | 0.9 | 0.2 | 1.2 | 0.2 | 3.3 | 12.6 |
| Pakaytambo | 03-03-0001 | Alca-1 | 8.6 | 3.0 | 16.8 | 3.0 | 0.4 | 2.1 | 0.3 | 1.7 | 0.3 | 0.9 | 0.1 | 1.0 | 0.1 | 3.0 | 12.5 |
| Pakaytambo | 03-03-0003 | Alca-1 | 8.7 | 3.0 | 17.6 | 3.1 | 0.4 | 2.2 | 0.3 | 1.8 | 0.3 | 0.9 | 0.1 | 1.0 | 0.1 | 3.1 | 13.0 |
| Pakaytambo | 03-07-0007 | Alca-1 | 6.3 | 3.7 | 14.1 | 3.2 | 0.6 | 1.8 | 0.3 | 2.1 | 0.4 | 1.0 | 0.2 | 1.2 | 0.1 | 2.9 | 9.9 |
| Pakaytambo | 03-07-0009 | Alca-4 | 7.4 | 2.2 | 16.9 | 2.8 | 0.5 | 1.9 | 0.2 | 1.5 | 0.3 | 0.8 | 0.1 | 0.9 | 0.1 | 2.8 | 8.9 |
| Pakaytambo | 03-07-0059 | Alca-1 | 8.1 | 3.0 | 16.7 | 2.9 | 0.4 | 2.0 | 0.3 | 1.7 | 0.3 | 0.9 | 0.1 | 0.9 | 0.1 | 2.9 | 12.2 |
| Pascuita | PAS101 | Alca-1 | 10.8 | 3.4 | 17.2 | 3.0 | 0.5 | 2.1 | 0.3 | 1.9 | 0.3 | 0.9 | 0.1 | 1.1 | 0.1 | 3.2 | 12.4 |
| Qosqospa | QOS101 | Alca-1 | 10.5 | 3.8 | 16.6 | 2.9 | 0.5 | 2.4 | 0.4 | 2.0 | 0.4 | 0.9 | 0.2 | 1.1 | 0.2 | 3.4 | 15.3 |
| Qosqospa | QOS102 | Alca-1 | 10.5 | 4.0 | 17.6 | 3.0 | 0.5 | 2.4 | 0.4 | 2.0 | 0.4 | 0.9 | 0.2 | 1.0 | 0.2 | 3.6 | 17.7 |
| Qosqospa | QOS103 | Alca-1 | 10.7 | 4.4 | 18.6 | 3.3 | 0.5 | 2.6 | 0.4 | 2.0 | 0.4 | 1.0 | 0.2 | 1.1 | 0.2 | 3.7 | 18.2 |
| Qosqospa | QOS104 | Alca-1 | 10.4 | 4.0 | 16.8 | 2.9 | 0.4 | 2.4 | 0.3 | 1.9 | 0.4 | 0.9 | 0.2 | 1.1 | 0.2 | 3.4 | 15.8 |
| Qosqospa | QOS105 | Alca-1 | 10.6 | 3.8 | 17.2 | 2.8 | 0.5 | 2.6 | 0.3 | 2.0 | 0.4 | 0.9 | 0.1 | 1.1 | 0.2 | 3.5 | 16.0 |
| Qosqospa | QOS106 | Alca-1 | 10.2 | 4.1 | 17.5 | 3.1 | 0.5 | 2.4 | 0.4 | 1.9 | 0.4 | 0.9 | 0.2 | 1.1 | 0.2 | 3.5 | 17.2 |
| Qosqospa | QOS107 | Alca-1 | 10.2 | 3.7 | 16.3 | 2.9 | 0.5 | 2.3 | 0.3 | 2.0 | 0.3 | 0.8 | 0.2 | 1.1 | 0.2 | 3.2 | 15.8 |
| Qosqospa | QOS108 | Quispisisa | 9.6 | 9.9 | 13.4 | 2.2 | 0.4 | 1.8 | 0.3 | 1.7 | 0.3 | 0.8 | 0.1 | 1.2 | 0.2 | 3.2 | 20.8 |
| Qosqospa | QOS109 | Alca-1 | 10.8 | 4.6 | 19.9 | 3.4 | 0.6 | 2.8 | 0.4 | 2.3 | 0.4 | 1.0 | 0.2 | 1.2 | 0.2 | 3.8 | 19.1 |
| Qosqospa | QOS110 | Alca-1 | 10.8 | 3.8 | 17.7 | 2.9 | 0.5 | 2.6 | 0.4 | 2.2 | 0.4 | 0.8 | 0.2 | 1.1 | 0.1 | 3.4 | 15.5 |
| Alca-1 geologic | KRA-065 | Alca-1 | 8.3 | 3.0 | 17.1 | 3.0 | 0.4 | 2.1 | 0.3 | 1.7 | 0.3 | 0.9 | 0.1 | 0.9 | 0.1 | 2.9 | 12.4 |
| Alca-2 geologic | KRA-003 | Alca-2 | 8.9 | 3.6 | 24.4 | 3.7 | 0.6 | 2.6 | 0.3 | 1.9 | 0.3 | 1.0 | 0.1 | 1.1 | 0.2 | 4.1 | 15.4 |
| Alca-3 geologic | KRA-012 | Alca-3 | 9.0 | 2.9 | 20.5 | 3.3 | 0.6 | 2.3 | 0.3 | 1.8 | 0.3 | 1.1 | 0.1 | 1.2 | 0.2 | 3.9 | 12.4 |
| Alca-4 geologic | KRA-254 | Alca-4 | 7.2 | 1.8 | 14.4 | 2.5 | 0.4 | 1.8 | 0.2 | 1.5 | 0.3 | 0.8 | 0.1 | 0.9 | 0.1 | 2.5 | 7.3 |
| Alca-5 geologic | KRA-112 | Alca-5 | 8.5 | 3.1 | 18.2 | 3.1 | 0.5 | 2.3 | 0.3 | 1.8 | 0.3 | 0.9 | 0.1 | 1.0 | 0.1 | 2.9 | 13.1 |
| Alca-7 geologic | KRA-101 | Alca-7 | 8.8 | 4.1 | 15.9 | 2.7 | 0.4 | 2.1 | 0.3 | 1.8 | 0.3 | 1.0 | 0.1 | 1.1 | 0.2 | 2.5 | 15.2 |
| Anillo geologic | Anillo | Anillo | 10.9 | 4.6 | 23.4 | 3.7 | 0.6 | 2.6 | 0.3 | 2.1 | 0.4 | 1.1 | 0.2 | 1.3 | 0.2 | 3.6 | 19.7 |
| Chivay geologic | Q02002-1-1 | Chivay | 12.6 | 7.1 | 14.4 | 3.3 | 0.2 | 2.6 | 0.4 | 2.5 | 0.5 | 1.4 | 0.2 | 1.5 | 0.2 | 3.3 | 21.6 |
| Quispisisa geologic | 9007.2.4 | Quispisisa | 6.9 | 8.4 | 13.1 | 2.2 | 0.3 | 1.6 | 0.2 | 1.3 | 0.3 | 0.8 | 0.1 | 0.9 | 0.1 | 2.5 | 16.8 |