Compositional data supports decentralized model of production and circulation of artifacts in the pre-Columbian south-central Andes

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Abstract

The circulation and exchange of goods and resources at various scales have long been considered central to the understanding of complex societies, and the Andes have provided a fertile ground for investigating this process. However, long-standing archaeological emphasis on typological analysis, although helpful to hypothesize the direction of contacts, has left important aspects of ancient exchange open to speculation. To improve understanding of ancient exchange practices and their potential role in structuring alliances, we examine material exchanges in northwest Argentina (part of the south-central Andes) during 400 BC to AD 1000 (part of the regional Formative Period), with a multianalytical approach (petrography, instrumental neutron activation analysis, laser ablation inductively coupled plasma-MS) to artifacts previously studied separately. We assess the standard centralized model of interaction vs. a decentralized model through the largest provenance database available to date in the region. The results show: (i) intervalley heterogeneity of clays and fabrics for ordinary wares; (ii) intervalley homogeneity of clays and fabrics for a wide range of decorated wares (e.g., painted Ciénaga); (iii) selective circulation of two distinct polychrome wares (Vaquerías and Condorhuasi); (iv) generalized access to obsidian from one major source and various minor sources; and (v) selective circulation of volcanic rock tools from a single source. These trends reflect the multiple and conflicting demands experienced by people in small-scale societies, which may be difficult to capitalize by aspiring elites. The study undermines centralized narratives of exchange for this period, offering a new platform for understanding ancient exchange based on actual material transfers, both in the Andes and beyond.

Significance statement

The exchange of goods is a key factor in the development of complex societies. The Andes have provided a fertile ground for investigating this process, yet the long-standing emphasis on qualitative assessments of artifact similarities has left important aspects of ancient exchange open to speculation. Through a multianalytical and multimaterial approach we examine regional connections in Formative Period northwest Argentina. The results unveil a far more multifaceted, decentralized network than previously thought, challenging standard approaches that have favored centralized patterns of regional interaction. The study opens avenues for investigating the dynamic interaction between local and regional networks in small-scale societies through actual material transfers, both in the Andes and beyond.

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Introduction

The long-distance exchange of goods and resources has long been central to the investigation of cultural complexity in human societies (1-4), with recent developments expanding our understanding of the deep roots of human networked sociality (e.g. (5). The south central Andean region of South America, with its long-term record of socio-material interactions across vast areas (6, 7), has provided a fertile ground for scholarly debates on the role of such practices in the emergence of socio-political hierarchies and statehood (7-15). We examine some of these practices in NW Argentina (NWA), part of the south central Andes, through a multi-analytical approach incorporating petrography, compositional and archaeological analysis of pottery and obsidian artefacts, previously studied separately. Our study examines the circulation of pottery and stone artefacts between 400 BC until AD 1000. This long segment in the region's prehistory is a part of the Formative Period (FP, c. 1500 BC-AD 1000), characterized by the gradual unfolding of sedentary lifestyles, productive subsistence technologies, and new craft technologies (for a comprehensive critical synthesis of the FP and its internal phases, see (16)).

Earlier studies of long-distance mobility and exchange in NWA focused on reconstructing regional networks on the bases of typological similarities, hypothesizing the dominance of different centers through time (17-19). These approaches raised important questions on the degree of integration of the region within the wider south-central Andean context, while developing an important baseline to investigate the general direction of inter-regional contacts. However, the nature and scale of interaction has remained largely speculative until today, with discussions focusing on specific areas that are taken as exemplary (e.g., (12, 20)), or on integrating disparate evidence generated through a variety of approaches and methodologies (e.g., (21-24)).

Specific methodologies oriented to answering questions of inter-community and inter-regional interaction have been implemented in the last 35 years in NWA and in the Andes more widely, with particular emphasis on the combination of petrography and compositional analysis (e.g., (25-29)), or the incorporation of compositional analysis to the study of a variety of materials into broader studies in recent years (30-40). Yet such studies have selectively focused on individual classes of archaeological evidence (i.e. either pottery or obsidian), unintentionally concealing the substantial complexity of ancient exchange practices. While more expansive methodologies involving several analytical approaches to pottery such as the one implemented in this study are starting to be applied elsewhere (41), examples of multi-artefactual studies are rare, both in the study area and beyond. Our methodology was designed to implement the phased integration of different materials into the same study following the conceptual underpinnings of our project, which focuses on understanding the diverse socio-material basis for the constitution of early village societies and their regional spaces of interaction. We follow Gosden's (42) early proposition of 'social landscapes' as the effect of, and precondition for, the development of complex of webs interpersonal and inter-community mutual obligations, understandings, and expectations. Embedded in this concept is an approach that, while not eschewing formal analysis, emphasizes networks as both powerful descriptors for regional social practices and as performative cultural models for how societies imagine and create their own regional worlds (43, 44). The present study considerably expands a successful preliminary study (45), by determining source areas for five hundred and forty two ceramic samples, seventy four obsidian artefacts and thirty nine volcanic rock artefacts from seven sectors in the semi-arid valleys sub-area of NWA (see Materials and Methods) (Fig.1).

Exchange and interaction in the south-central Andes

Within the broader context of Andean exchange and ecological complementarity studies (46, 47), south-central Andean scholars have developed models that consider the region's specificity, particularly in connection to the role of llama caravans (7, 22-24, 48-50). While large caravans were a late development in NWA, llama-assisted long-distance circulation of goods can be traced to the region's earliest human occupations (6, 51). Such practices have been seen as promoting societal integration through the development of symmetrical regional ties that, while long-lasting, became increasingly co-opted by aspiring elites (7, 50, 51). For instance, the expansion of Tiwanaku, particularly in its peak phase (AD 500-1000), is often related to the extension of long-existing networks, which substantiated new inter-elite exchanges and facilitated the growth of regional centers in NW Argentina and Chile (17, 19, 48, 52).

Within this framework, and based on typological analysis, the spatial distribution of diagnostic artefacts and/or motifs has been used to propose internally homogeneous and mutually exclusive regional spaces of interaction (or 'cultural areas') dominated by particular 'head settlements' or nodes. For example, the Alamito culture within Campo del Pucará (c. AD 100-500, Campo from now on), and the sites comprising the 'Aguada complex' in the Ambato Valley (c. AD 600-900, Ambato from now on) (Fig. 1), have been proposed by early researchers (17-19, 53, 54) as centers that controlled the regional dissemination of materials and ideas across NWA at different times in the region's prehistory. This emphasis on the central role of particular areas in regional networks has started to be revised recently, yet it continues to underlie studies of socio-political change (55-58). In particular, the alleged ceremonial centrality of these areas has been recently questioned within a broader discussion of the material basis for assessing ceremonial monumentality in the region (59). Similarly, the extent to which the so-called Aguada 'phenomenon' or 'cultural complex' reflects a hierarchical society, and the nature and scope of its regional influence, continue to be debated (59, 60). Scattolin (61-63) in particular, has documented the sparsity of the characteristic Aguada ceramic styles and iconographic motifs in our core study area, which appears to indicate a very limited, if not altogether absent, Aguada influence. While initially noted (64), this fact became largely obscured by models that treated the chronological sequence of the Hualfín Valley as the 'master sequence' for most of NWA (see (17, 19, 52, 64)). Scattolin's careful revision of stylistic data complements the observation that the distinct spatial layouts recorded at Alamito and Aguada heartlands, which stimulated much examination of their internal complexity and hierarchy as well as their mutual relationship (56, 65), were actually one of the many architectural traditions within the varied settlement landscape of NWA's Formative period (63).

There is therefore much room for improvement in the definition of the nature and scale of the relationship between alleged 'central' areas, as well as within these and 'peripheral' archaeological areas of NWA, in ways that are sensitive to artefactual diversity across several axes of variation (technical, stylistic, spatial, temporal). While inter-elite exchanges of high-value items cannot be ruled out (22, 51, 66), such exchanges and connections need to be contextualized in a broader set of practices of circulation involving a wide range of communities and materials at various spatial scales, before assumptions are made on the capacity of elites or charismatic individuals to build their authority on the bases of regional exchange. Here we build upon data acquired in recent years by members of this project and collaborators, which shows that Formative period communities had a more generalized, non-hierarchical access to materials, resources and skills than previously allowed by elite-oriented models (63, 67, 68), to generate a new approach to regional interaction in the period. Central to our project of re-examining the nature of regional connections are the facts that (a) pottery styles traditionally assumed to have mutually exclusive distributions in specific cultural areas often coexist in the same archaeological contexts (62, 69); (b) traits long-assumed to be 'diagnostic' of particular pottery styles were actually modified and recombined in various ways across the region (70); and (c) obsidian circulation crossed over the distribution areas of a variety of pottery styles, thus connecting communities engaged in the use of very different material assemblages (71). This cumulative body of evidence calls for a concerted effort to revise the standard centralized, elite-driven model of long distance interaction, which continue to be active as the basis for most operative assumptions when investigating the period's socio-political dynamics (55-58, 60), and dominate overall approaches to the region's cultural prehistory (see discussion in (72)). This is not only apparent in our study area, as broader reappraisals on the enduring power of typological approaches in archaeology have shown, (e.g., (2, 73)). Yet unlike other critical reviews of such models (74) our study not only reexamines existing data under new theoretical light, but also provides a large-scale regional multi-analytical dataset of both stone and ceramic artefacts. These dataset enables, for the first time in the region, the careful tracking of concrete, material relations between places, before assuming the importance, or lack thereof, of particular connections.

It is therefore useful to carefully examine the expectations of both approaches to long-distance exchange and interaction. A centralized model would be compatible with the existence of a small number of production areas for key pottery styles as well as with relatively few settlements controlling geographically scarce resources, such as obsidian, which redistributed these goods to sites in the network that lacked access to them. This pattern might be expressed as disproportionate densities of particular artefacts at sites according to rank, and with centralized production of lithic and/or pottery artefacts. Contrary to the centralized model, a decentralized model would expect the circulation of raw materials and finished goods in a variety of directions. This would result in the existence of multiple production areas for a variety of decorated pottery styles. In the cases of goods such as obsidian, which even in generally open regional exchange systems may be subjected to some level of selective or limited access (75), a decentralized model would imply a relatively even distribution of materials and a generally domestic production of artefacts across settlements of different standing in the network, given the absence of mechanisms and facilities for the organized control of production and/or distribution. The decentralized model would also be compatible with smaller, material-specific networks crisscrossing the larger circuits followed by other materials. These contrastive models encompass Nielsen's (76) classification of caravan network patterns: convergent or divergent (according to the degree of concentration in the flow of goods), and segmentary vs continuous (according to the number of interconnected nodes), as well as Tripcevitch's (40) extension of Nielsen's model to discuss diffuse and centralized networks for obsidian. Our study provides the first multi-material regional dataset to assess the occurrence of these patterns and their implications in terms of cultural complexity and socio-political hierarchization. While some of the artefacts that circulated across the region were small components of the overall assemblages at particular sites (e.g., Vaquerías and Condorhuasi wares, obsidian, see Appendix), they provide a window to understand the backbone of this social landscape; that is, how the terrain was shaped through the material connections supporting mutual obligations, expectations and demands experienced by the period's small scale societies. These connections are raw material through which socio-political alliances are built or undermined, therefore understanding theirs structure is of central importance when assessing the regional role played by particular locations. While starting from a contrastive point can be a useful heuristic device, our approach aims at understanding the interaction between social processes of hierarchization and de-centralization rather than fueling either/or discussions on the emergence and development of cultural complexity.

Materials and Methods

The study focuses on a 50-60km wide area in the semi-arid valleys section of NWA, encompassing the southern Calchaquí valleys (Cajón, Santa María), the western hillside of the Aconquija Sierra (Aconquija), and El Bolsón Valley (Bolsón). This core study area provided the bulk of the sample analysed, which were obtained directly through our primary research over the last three decades. The Santa María valley site of Soria 2 has been the focus of another research project (77), which has lent samples for this study. The study also included materials from relevant neighboring valleys and basins, such as Hualfín Valley (Hualfín), Campo del Pucará (Campo), Calchaquí Valley (Calchaquí), Laguna Blanca (Laguna), and Campo de los Alisos (Alisos), which were obtained through museum collections and/or provided by other research projects (see Acknowledgements). More distant areas (around 150-200 Km) include Quebrada del Toro (Toro), and the Lerma Valley (Lerma) (Fig. 1) (SI Appendix, Table SI 1). The methodology combined petrography and instrumental neutron activation (NAA) for ordinary and decorated wares (n=542) as well as for raw clay and experimental samples; X-ray fluorescence (XRF) and NAA for obsidian and volcanic rock artefacts, and targeted laser ablation inductively-coupled plasma mass spectrometry (LA-ICP-MS) for two distinct polychrome wares (Condorhuasi and Vaquerías) (Fig. 2). The targeted approach to these two wares sought to assess earlier hypotheses concerning their non-local origin, which proposed that the Vaquerías style originated at Lerma and spread widely across NWA and Chile trough llama caravans, albeit in very low frequencies (78, 79), see recent discussion in (80). Polychrome Condorhuasi style has been interpreted as originating either at Hualfín or Campo, and it has also been considered an indicator of long-distance llama caravan traffic, although its distribution seems to be limited to the southern sector of NWA (53, 81), see recent discussion in (82). NAA also included clay samples from 10 known sources (Fig. 1), two samples of archaeological raw clays recovered at the site Soria 2 (Santa María), and two modern pottery samples manufactured with other local clays (SI Appendix). Petrographic analysis of 299 sherds (55% of the chemical sample) as well as clay and sand samples was conducted through point-counts as well as qualitative analysis (see SI Appendix 1.4). Both ordinary (Fig. 2 c1) and decorated wares (Fig. 2 c2-c5) were sampled for each region when possible, attending to maximizing the representativeness of the ceramic variability of each area's assemblage (additional details on sampling in section 1.3 SI Appendix). Seventy-four obsidian samples were selected to monitor the range of different kinds of obsidian sources used at particular sites (Fig. 2a). The obsidian results contribute to previous studies conducted by members of this team as part of various projects in the last 23 years, resulting in a total sample of 210 sourced obsidian artefacts available for the study area ((37, 39, 68, 83),Fig. SI 3, Table SI 2, for additional obsidian studies from this period in NWA see (84)). Thirty-nine volcanic rock artefacts (commonly referred locally as vulcanite (85)) from the 'La Ciénaga basaltic industry' identified in the 50's at Hualfín (86) were selected to assess whether this specific type of artefact was made at different locations with different varieties of this raw material (Fig. 2b).

To better monitor variations in the use and circulation of sources across the long period considered in this study, we divided our samples following stylistic and newly calibrated radiocarbon data (62, 87) in four phases or temporal groups: T1 (400 BC-AD 100); T2 (AD 100-450), T3 (AD 450-650) and T4 (AD 650-1000). Condorhuasi and Vaquerías have a temporal distribution limited to T1 and T2, while other motifs and decorative and manufacture techniques—including modelled, polished grey or buff and incised decoration—continue across the sequence. Ciénaga wares vary considerably in time, with the variety red on buff being characteristic of T2 (see SI Appendix section 1.1.). Statistical analysis showed that the observed spatial and temporal variation of pottery chemical group frequency is significant (SI Appendix, Section 2, Fig. SI 1). All elemental data can be accessed at the MURR Archaeometry Laboratory website http://archaeometry.missouri.edu/datasets/ Petrographic data can be accessed at the University of Exeter's repository https://ore.exeter.ac.uk/repository/

Results

Lithic source assignments

The analysis identified three sources that supplied most of the sites in the study area: Cueros de Purulla (Cueros), Ona-Las Cuevas (Ona), and Laguna Cavi (Cavi) (Figs. 3a, Fig. SI 3; Table SI 2). These results support the macroscopic identification of Ona obsidian, while highlighting that the same approach can be misleading when applied to opaque obsidian from either Cavi or Cueros. The results also strengthen previous observations regarding the preeminence and spatial reach of Ona. Cavi and Cueros obsidian were less frequently used and had geographically restricted distributions, with the former being relatively more frequent among the opaque sources. Toro continues to appear as a region with privileged access to obsidian as identified in previous studies (39), including both the main northern source (Laguna Blanca-Zapaleri) and the principal southern source (Ona). Toro also had access to Alto Tocomar and an unidentified source in the Atacama region of Chile (Fig.1). The minor sources Cavi and Cueros did not reach Toro. The overall pattern confirms a decentralized, diffuse network (in the sense discussed above, (76)) of circulation of this material, particularly in connection with Ona. The results also show that areas such as Cajón, Bolsón, Aconquija and Santa María had access to all the sources from the southern sector of NWA, although Cajón and Bolsón appear to have much larger frequencies of Cavi and Cueros compared to other areas.

The volcanic artefact samples analyzed mostly fell within Type 1 (n=26), and a few in Type 2 (n=7, Figs. 3 b, Fig. SI 4, Table SI 3). Three samples were considered outliers, while one sample was considered an extreme outlier. It is very significant that the Type 1 includes La Ciénaga material collected at Hualfín in the 1950's (86), providing further support to the results obtained by the preliminary study mentioned earlier. Type 1 vulcanite connects Hualfín with Aconquija and Cajón (Figs. 1, 4), while Type 2 vulcanite circulated between Bolson and Aconquija, with a minimal presence at Santa María. While the geological source remains unidentified, outcrops of the same geological formations located in both Hualfín and Cajón are likely sources for this material (88). These results show that the raw material used for making the highly formalized and very large side scrapers came largely from a single source, indicating the existence of a direction-specific, segmentary network in the sense discussed above (76), involving these artefacts during T2 and part of T3.

Pottery results

The geology of our core study area makes it a difficult region to employ petrographic and compositional analyses of pottery because most of the sediments suitable for pottery production form through weathering and run off of similar parent materials in the mountains (88-90). While mineralogical and chemical differences among the raw materials used to manufacture pottery appear across space within interior drainage basins, these differences tend to be very subtle due to the mixing of sediments. In this context, petrography analysis identified 16 fabric groups, which can be grouped in three large classes: coarse, intermediate, and fine fabrics (SI Appendix, Figs. SI 2, SI 5a), but the classification in different petrographic groups was often dependent on minimal mineralogical variations (82).

Because of the difficulties of chemical sourcing in this region, we employed a staged analysis for NAA involving firstly the construction of core reference groups, and secondly a canonical discriminant analysis (CDA) on the core reference groups. We then used these discriminant functions to assign the remaining specimens to the best group, which served as bases for the creation of macrogroups (see Appendix, section 1.10). NAA results show twelve core groups and nine macrogroups obtained through CDA, of which 8 are relevant to the sample discussed here: MG2, MG3, MG5, MG6, MG7, MG8, MG9 and MG11 (Fig. 3; Table SI 4). The core chemical groups that were the bases to construct the chemical macrogroups are described in the SI Appendix. Table SI 5 shows the distribution of ordinary and decorated wares in the assigned samples (n=417). These assignments accord fairly well with the results of petrography analysis (Fig. SI 5a, see also Fig. SI 6 for Canonical Discriminant factor loadings for chemical macrogroups), while showing clear differences between closely related or undistinguishable samples at petrographic level. For instance, most samples from petrographic groups A and A', identified in ordinary wares local to the western and eastern slopes of the Aconquija Sierra respectively, fall within the clearly distinct MG5 and MG8 (there is also some presence of each of the petrographic groups in both MGs, which will be addressed below). Tables SI 7, SI 8, SI 9 and SI 10 provide details of the uncertainty of values measured in ceramics, the detection limits, the mean and coefficient of variation (CV) for every macrogroup, and the discriminant factor loadings for the first 4 canonical discriminant factors (see SI Appendix). The results also accord well with the chemical group structure identified through previous analyses (45), though increasing sample sizes over time typically requires some restructuring (SI Appendix, Section 1.7-1.7.2, Figure SI 5c).

Some of the clay samples analyzed approximate certain chemical macrogroups: La Viña/Las Conchas to MG2; Jujuil to MG3; Los Colorados to MG6, and one Aconquija sample to MG8 (Fig. 1, and SI Appendix, Fig. SI 5b). However, these trends are not sufficiently strong to assert the membership of the clay samples into these groups. This is not surprising, as the location form where we took the sample may not have been where ancient potters collected their local clay for firing, while the addition or removal of aplastics may further complicate chemical matching between sample and raw clay. These associations are therefore best treated as hypothesis for further work. We discuss below the main trends in the pottery data:

1) **Inter-valley *heterogeneity* of clays and fabrics in ordinary wares within the core study area.**

Petrography analysis identified distinct coarse fabrics, with intentionally added sands (33-46%) of wide granulometric range at Aconquija, Cajón, Santa María, Campo, and Toro. Chemical results obtained for ordinary wares have assigned ordinary ware samples to five macrogroups (Table SI 4) discussed below (Fig. SI 10). The criterion of abundance, which states that the most common composition at any given site is likely of local production in societies that lack mass transportation technologies (91), is often used for determining source areas in compositional analysis. However, this principle should be applied alongside archaeological and petrographic observations, as an abundance of samples from particular areas may be signaling sampling biases due to availability, among other issues (29). Caution should also be exercised when interpreting the potential production areas and circulation routes of ordinary wares in basins such as our core study area, given the geologic homogeneity mentioned above. With these considerations in mind, we advance the following source areas:

MG3 has a majority of ordinary samples from Santa María and Aconquija. Given the proximity of this group with the clay source Quebrada de Jujuil (Fig. 1, Fig. SI 5b), and the abundance of Santa María ordinary wares, it is possible to propose the southern Santa María as the source area for this group (Source area MG3). The clay was also used to manufacture a few decorated wares from both areas as well as from Cajón, which appear to be local to the valleys where they were found, but petrography is inconclusive in this regard. **MG5** has a majority of Aconquija ordinary wares, with samples from Campo and Cajón in second and third place, and a few specimens from Santa María, Bolsón and Hualfín. The petrography of the Aconquija and Campo samples included in this macrogroup is very similar, due to the similarity in the inclusions and the clay used on both sides weathering from the same parent material. Petrography analysis of a subset of the remaining samples in this group appears to indicate that these potsherds belonged to vessels made locally at each of the valleys where they were recovered, therefore cannot be considered imports. We therefore consider Aconquija as the soruce ara for this group (Source area MG5). **MG6** contains a majority of samples from Cajón and Santa María, with three samples from Aconquija and one sample from Bolsón. As mentioned above, MG6 associates with the Los Colorados clay sample from Santa María (Fig. 1, Fig. SI 5b). Petrography analysis, however, shows that the samples in this macrogroup are local to the valleys where they were recovered from, therefore we cannot assert whether Cajón or Santa María were the source areas for this group. **MG8** has a majority of Aconquija ordinary wares, with Campo samples second in frequency, and it also contains a few ordinary samples from Bolsón and Cajón. This group presents a similar problem as MG5 in terms of source area allocation, with the difference that MG8 is closely associated to the clay source La Aspereza, in Aconquija (Fig. 1, Fig. SI 5b). This means that this clay was used on both sides of the Aconquija range to manufacture similar ordinary wares as indicated by petrography analysis. While the majority of Aconquija samples could signal a sampling bias due to sample accessibility, the Chi square test conducted shows that the distribution of macrogrup frequencies across valleys is not random (see SI Appendix, Section 2), therefore Aconquija could be considered the source area for this macrogroup (Source area MG8). Samples from the Bolsón and Cajón included in this group could represent imports of the clay to these valleys, as their fabrics appear to be local, but petrography is inconclusive in this regard. **MG11** includes most ordinary wares from Toro, and petrography clearly identifies the fabric as local (Source area MG11). Two specimens from Cajón are also included in this group and they can be considered clear imports, as their petrography is also clearly similar to the samples from Toro as shown by their metamorphic content (fabric VC, see SI Appendix, section 1.4).

2) Inter-valley *homogeneity* of clays and fabrics for *decorated wares* within the core study area.

Petrography analysis identified two major groups of fine fabrics, with either very low percentage of intentionally added very fine aplastics (Fabric L) (10-30%) or absence of intentionally added aplastics (Fabric M). These fabrics were employed in the manufacture of a wide array of decorated wares found in most valleys and areas (SI Appendix, Section 1). These results agree well with the results of NAA, which was able to distinguish two distinct chemical groups for decorated wares of fine and intermediate paste fabrics that were largely dominant in the manufacture of decorated wares in the core study region (Fig. SI 11). **MG2** includes 76 percent of the all assigned fine wares, and many of the unassigned specimens are also chemically similar to MG2. The samples come largely from Santa María and Aconquija, but also from Hualfín, Bolsón and Cajón. We consider Santa María as a potential source area for this group (Source area MG2, Fig. 4). No samples from Campo or Toro were assigned to this group. **MG7** mainly includes decorated wares from Hualfín, as well as decorated and ordinary wares from the Bolsón. No ordinary wares from Hualfín were available at the time of the study, but given this results and that both valleys belong to the same basin, it is possible to consider Bolsón and Hualfín as a single source area (Source area MG7, Fig. 4).

The case of decorated style Ciénaga (red on buff painted variety), a characteristic style of the period (T1 and T2) thought to originate from Hualfín, (Fig. 2 c5) is particularly interesting. Fragments of this style of pottery found at Aconquija sites were made with materials of the MG7 chemical group, while a few but similar Ciénaga specimens recovered at Hualfín sites were made with materials of the MG2 chemical group. MG2 could potentially be divided into two subgroups, MG2a and MGb, with predominance of Santa Maria/Aconquija and Hualfín specimens respectively (Fig. SI 5c). MG2b in particular includes a range of diagnostic styles traditionally associated with Hualfín, such as painted Ciénaga and incised Ciénaga, and painted Aguada wares. The manufacture, decorative techniques and motifs are distinctive and the whole group clearly separates from the rest of MG2 wares. However, petrography analysis has not identified differences in the fabrics of potsherds belonging to both MG2 sub-groups, therefore this division cannot be explained due to the inclusion of different aplastics. If the current association MG2 with Santa María clay sources is confirmed in further studies, the pattern shows a complex scenario in which (a) Hualfín potters were using a range of clays to manufacture Ciénaga, Aguada and other characteristic pots, which then moved around the core study area; (a network involving the movement of clay and/or skill initially, and then the pots themselves); and/or (b) painted Ciénaga pots were made at different locations with different clays and then circulated between those areas (a network involving the relocation of potters who then exchanged pots of a particular style). These options should be evaluated alongside the possibility that MG2b is the result of the mixing of different clays; targeted analysis of the clay matrix of these wares was not available at the time of this study but it is planned for the next phase of analysis.

3) Selective circulation of two *distinct* polychrome wares: Vaquerías and Condorhuasi.

The application of LA-ICP-MS to Condorhuasi, Vaquerías, (Fig. 2 c3, Fig. 2 c4), and ordinary wares found in the same archaeological contexts (n=96), enabled the integration of the three different analysis (Figs. SI 7, SI 8, SI 9; Table SI 6).

***Vaquerías*: **Petrography identified a distinctive intermediate fabric (Fabrics N, N') which include metamorphic components that indicate that Toro and/or Lerma may have been the source areas. Fifty two percent of the Vaquerías samples analyzed through petrography fall within NAA MG9, which showed their unique temper to be high in Sb. The clay fraction is also fairly homogenous. Eighty-seven percent of Vaquerías samples fall within ICP-Group A (Fig. SI 7, SI8). One Vaquerías sample from Cajón was found to have similar clay fraction to ICP-Group B, but it is borderline and intermediate with the main ICP-Group A. Further studies would be needed to assess whether a second variety of Vaquerías was made locally in the southern sector of the study area with the same fabric but different clay. Additionally, the study showed that the potters who made Vaquerías style used different clay than the one they used for ordinary wares in Toro, which were made with ICP-Group D clay. This does not necessarily mean that Vaquerías was foreign to Toro. The generalized use of metamorphic rocks as aplastics, both for Toro ordinary wares and Vaquerías, points at the Toro/Lerma basin as the source area for this ware. In the future, balancing the sample to include more specimens from Lerma (unavailable at the time of the study) could clarify the relationship between these two sectors of the same basin. The results strongly indicate the existence of a consistent technical mode and clay choice across the samples from various locations. It should be noted that among the Vaquerías samples, four could be considered local copies of this style made in Cajón, as shown by their petrographic pattern and their assignation to MG2 (these samples were not subjected to LA-ICP-MS).

***Condorhuasi*:** Petrography analysis only identified very slight variations in the mineralogical composition of ordinary and Condorhuasi fabrics from Aconquija and Campo (Fabrics A, D and A', D' respectively, Fig. SI 7, SI 9). This is not surprising given the closeness between these two areas. Additionally, NAA placed the samples in several groups with predominately ordinary wares: MG3 (n=7), which is related to the southern sector of the Santa María Valley, and MG5 (n=3) and MG8 (n=1), related to the Aconquija. Two samples with intermediate fabrics fell within MG2. The combined petrography and NAA results emphasized the local nature of Condorhuasi in Aconquija and Campo, although it was not possible to distinguish clear production areas. Importantly, some of the samples recovered at Campo sites had aplastics that were closer to the geology of the Aconquija and viceversa, signaling a complex pattern of technical practices to manufacture this ware at these two locations. In order to clarify this pattern, LA-ICP-MS was applied and results show that 93 % of the Condorhuasi samples recovered at sites in Aconquija and Campo were all made with ICP-Group B clay, while 77% of Campo ordinary wares also fall in this group (as shown by the red lines in diagram in Fig. SI 9). These samples are chemically distinct from ordinary wares found at Aconquija sites, which all fall in ICP-Group C (green lines in diagram, Fig. SI 9). At the same time, five ordinary samples from Campo were included in ICP Group-E (black lines in diagram, Fig. SI 9), which is characterized by high Rb and Cs. This group is tentative and further studies may suggest these samples are better considered to be outliers. However, it should be noted that these samples were all included in NAA MG8, which was also defined based on its extreme values of Cs and Rb. Petrography indicates the samples are similar to those in the Aconquija, but with slight textural variations indicating their local origin to Campo (petrography group A', see SI Appendix), therefore it is more likely that these samples are local to Campo, even though they might have used clay from Aconquija. The main results from the LA-ICP-MS support the hypothesis that Condorhuasi wares from these two areas were made at sites in Campo, or that people used the same clay to make this ware at a number of locations on both sides of the Aconquija range. More broadly, the results indicate that the circulation of Condorhuasi was part of a bidirectional movement of craft skills and materials between the communities on the western slope of the Aconquija Sierra and Campo, akin to what Gosselain (92) and others have described as "communities of practice"; small-to-medium scale networks involving the transmission of habitual learning practices through material and knowledge exchanges, more than centralized and/or directed exchange of specialist-produced fine wares.

Discussion

The wide range of connections implied by these results can be partially visualized in Figure 4, and in the pottery distribution maps in Figs. SI 10 and SI 11. While for the sake of clarity the circulation of Type 2 vulcanite and of clays and/or ordinary wares was not represented in Figure 4, these should be considered when assessing the overall significance of these connections. Importantly, Figure 4 also leaves out other elements, such as metals, salt, animals, produce, and organic materials (fibers, hides, shells) that may have circulated alongside, or in return for, the more durable ones considered here. The present section will draw the various strands of evidence generated by this study together.

Obsidian circulation, while low in volume (see Appendix), provides a persistent signal of these wide range of connections across areas throughout the whole period. The main source, Ona, reached as far as the fringe of the humid lowlands on the eastern side of Aconquija (Alisos) among other areas in the eastern lowlands, Fig. 4, Table SI 2), and to the north as far as Toro. Many of the sites that shared access to this source had very different material culture assemblages, which shows that groups involved in different communities of practice and even different cultural identities were engaged in exchange (e.g., sites in Aconquija and Antofagasta de la Sierra, Fig. 4) (68, 71). Through obsidian the region was connected farther afield, becoming a part of a long chain of sites (both in NWA and Chile) involved in the exploitation of the same sources. While on the one hand obsidian acted as a mediator of a wide range of connections, at times even between disparate groups, the circulation of the very large side scrapers made on volcanic rocks was basically limited to Hualfín, Aconquija and Cajón (Fig. 4), with a minor circulation of a secondary type of vulcanite between Bolsón, Aconquija and Santa María. This shows that smaller and more directionally-specific networks traversed the social spaces created by the larger networks, carrying particular sets of artefacts and the associated social and technical knowledge.

Ceramic results show a strong agreement among analytical techniques for ordinary and decorated wares. Petrography analysis indicates that "technical modes" of manufacture (82) for ordinary wares varied across valleys mostly qualitatively (in terms of type of aplastics) but not so much quantitatively (in terms of size and frequency of inclusions). The technical modes of decorated wares, on the contrary, did not vary so much across the study area, as a limited number were employed for a great diversity of decorative styles (most decorated wares have fabrics with little or no aplastics; decorated wares with intermediate fabrics, such as Condorhuasi or Ciénaga Red on Buff and Vaquerías, have limited temporal distribution). NAA complements this picture by showing clear distinctions in the chemical fingerprint of ordinary wares across specific valleys and areas, and a limited number of clays employed for decorated wares found across the region (MG2 and MG7) (Fig. 4). This pattern strongly suggests that there was a set of middle-range distance connections involving not only the circulation of raw materials and artefacts, but also the transmission of skills and concepts of manufacture and design that were not exclusionary. Some of these middle range networks appear to have involved the associated circulation of particular styles and specific stone tools, as indicated by the circulation of vulcanite artefacts originated in the Hualfín valley and of Ciénaga wares between Santa María, Aconquija and Cajón.

Condorhuasi and Vaquerías, clearly stand out from the rest of the pottery styles, as the networks involved in their production, circulation and use were temporally limited and geographically selective (Fig. 4). LA-ICP-MS results for Condorhuasi appear to strongly support the hypothesis that this ware was produced at Campo sites, however, this should not lead to the conclusion that Campo had a central or exclusive role in its production. Published records show low frequency of this ware in Campo assemblages (53), and our own excavations have shown that it is actually more abundant at some sites in Aconquija (at the site Ingenio Arenal-Falda, Figs. 1, 4). While Campo had a strong connection with Aconquija, its role in regional exchange may have been more nuanced than the one assumed by earlier studies (e.g., (54)), which argued, as discussed earlier, that Campo sites controlled emergent caravan networks and developed an important regional ceremonial role as a consequence of that purported control. The circulation of Condorhuasi wares between Campo and Aconquija has to be seen as part of one of the many movements of artefacts, skills and possibly clays that took place across the Aconqija sierra. This agrees with the expectation of the de-centralized model regarding the existence of artefact-specific networks crisscrossing the circuits followed by other types of artefacts that circulated larger distances and/or more frequently. Future work should focus on assessing the significance of Condorhuasi presence in other areas, such as the funerary assemblages at Hualfín and Laguna (81), and the domestic assemblages at Cajón and Bolsón (67, 69) (Fig. 1).

The integrated analysis of Vaquerías samples showed that there was a technical mode of making Vaquerías—with aplastics including metamorphic rocks, quartz, sandstone, and crushed pots —that was characteristic of the Toro/Lerma basin. Most of the samples found outside Toro/Lerma are clear imports, while only four can be considered local imitations. The results clearly show that Cajón was the only place in the core study area with substantial presence of Vaquerías style (as well as a small presence of MG11 ordinary wares from Toro), which reveals the role of this traditionally 'peripheral' valley in connecting the core study area with the Toro/Lerma basin, and indirectly, to the northern sector of NWA Chile. Here it should be noted that lithic assemblages from Cajón have a relatively higher frequency of the minor obsidian sources (Cavi, Cueros) compared to contemporary sites, while Toro had access to a wide range of obsidian sources, including one in Chile (Fig. 4).

One of the major outcomes of this study is the absence of Ambato Valley compositions (8) among our samples. Not only were the characteristic Ambato engraved grey-black wares absent from our study area, but also the clay used by Ambato Valley potters for these wares was not employed to make any of our samples. Together with the observed low frequency of painted Aguada varieties in our core study area (most of which are local versions of the style), the results of the geochemical analysis support a reconsideration of the purported central role of this valley. Recent analysis done by Giesso and collaborators (93) at MURR suggest that some of the Ambato valley Aguada wares were manufactured with MG2 clay, thus opening new avenues to rethink the relationship between our study area and the Ambato valley outside the traditional centralized models that have dominated regional discussions.

While the core study area can be considered to have been highly integrated through the circulation of materials and skills, this integration was not seamless. Resource circulation shows that rather than single, bounded cultural areas, the circulation of different materials and the enactment of various communities of practices created various regional spaces of participation and exchange, as shown by the shared modes of manufacture of ordinary wares in some cases (e.g., Campo and Aconquija), and the technical and chemical homogeneity observed among decorated wares in others (e.g., Aconquja, Santa María-Cajón-Hualfín, Bolsón). Collectively, the results demonstrate that a wide range of complex, intersecting networks were active simultaneously, without clear dominance of any particular node in time. While it is possible that some wares may have been produced at the same time in different areas, the hypothesis that clays, aplastics, and/or potters circulated across the region should be considered. These scenarios have been amply documented among present-day potters in the Andes (25, 94, 95) and our study contributes to improve the modelling of these practices in the past. This shows that ancient material circulation networks may have involved multiple mechanisms, including but not reducible to, camelid-assisted transport (24, 68). It also shows that different types of networks (i.e. segmentary, continuous, divergent , convergent, diffuse or centralized (40, 76)) are not necessarily associated with specific types of socio-political organization, but rather they are part of the wide repertoire of strategies that communities drew upon in order to build regional worlds of belonging through socio-material connections.

Implications

Early sedentary communities in NWA were embedded in a widespread range of transactions, projecting their daily activities onto a complex and ever-widening network of associations and mutual dependencies. These exchanges, while primarily integrative, were not devoid of competition and conflict, as earlier interpretations emphasized (e.g., (7, 51)). Mutual obligations among members of small-scale societies are fraught with stress over the possibility of their breaking down (96). This decentralized social landscape, a web of places connected through mutual obligations over the long term (42), certainly reflects the multiple and conflictive demands experienced by these societies. The importance of these demands for increasing social complexity cannot be minimized, as they can stimulate technological innovation, economic specialization, and social control. However, the diverse connections identified in this study show that communities did not need centralized organization to maintain flourishing networks. Intercommunity exchanges deployed a wealth of material and immaterial resources, which if used strategically, could limit the efforts of aspiring elites seeking to capitalize upon long-distance links. The results preclude simplistic interpretations of the role of exchange in the emergence and transformation of early sedentary societies, both in the Andes and elsewhere. Artefactual homogeneity across space can result from other types of interaction different from those proposed by centralized models, as communities may have participated in several scales or transactions: from the habitual learning networks that result in specific pottery manufactures modes (which may include both decorated and ordinary wares, e.g., Campo and Aconquija wares, including Condorhuasi); to the movements of raw materials and decorated vessels as part of the exchange of a wide (but not homogeneously distributed) range of materials (e.g., Vaquerías; various obsidian types); and even the movement of specific decorated types and formalized tools, involving perhaps the relocation of people across specific valleys (e.g., Ciénaga). Focusing on close intercommunity links rooted on common craft practices rather than solely on stylistic reconstructions is a more fruitful avenue to explore the ancient circulation of goods, skills, and people without assuming the capacity of early elites to manipulate and capitalize on such networks.

The recognition that small-scale, early sedentary pre-Columbian societies may have been able to manipulate exchange networks and reduce the capacity of aspiring elites to capitalize upon them for their own projects, challenges conventional wisdom of the nature of power and social interaction in small-scale societies. Our findings not only contribute to this debate, but also demonstrate how ancient, long-enduring practices of circulation and exchange—with their cumulative effects on land modification through routes and other infrastructure, as well as on the uses and cultural understandings of resources—have shaped past and present landscapes. While our conclusions are based on interpretations of the multi-technique and multi-artefactual analysis undertaken here, and we recognize that additional sampling will serve to refine our reconstruction in the future, our study shows that evidence-based, theoretically informed research can substantially enrich our interpretations of ancient connectivity practices, both in the study area and more widely.

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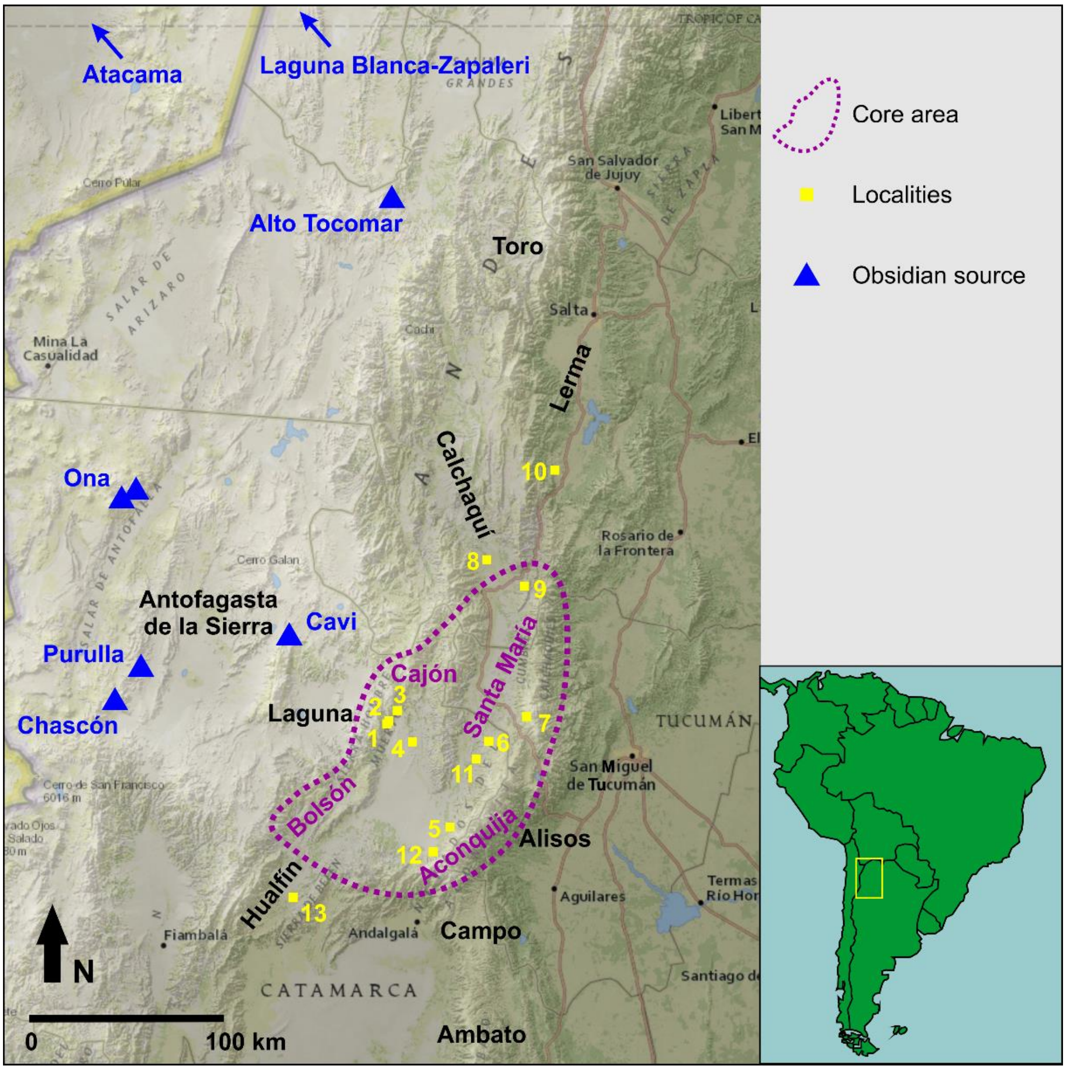

Figure 1 Study area, with valleys, obsidian sources, and localities mentioned in the text. **Clay sources**: 1 & 2- Cardonal; 3-Yutopian; 4- Arcillas Verdes; 5- La Aspereza; 6-Quebrada de Jujuil; 7- Los Colorados; 8- Palo Pintado: 9- Las Conchas; 10- La Viña. **Archeological sites**: 11- Soria 2; 12- Ingenio del Arenal-Falda; 13- La Ciénaga. Full list of sites included in the study available in Tables SI 1, SI 2 and SI 3.

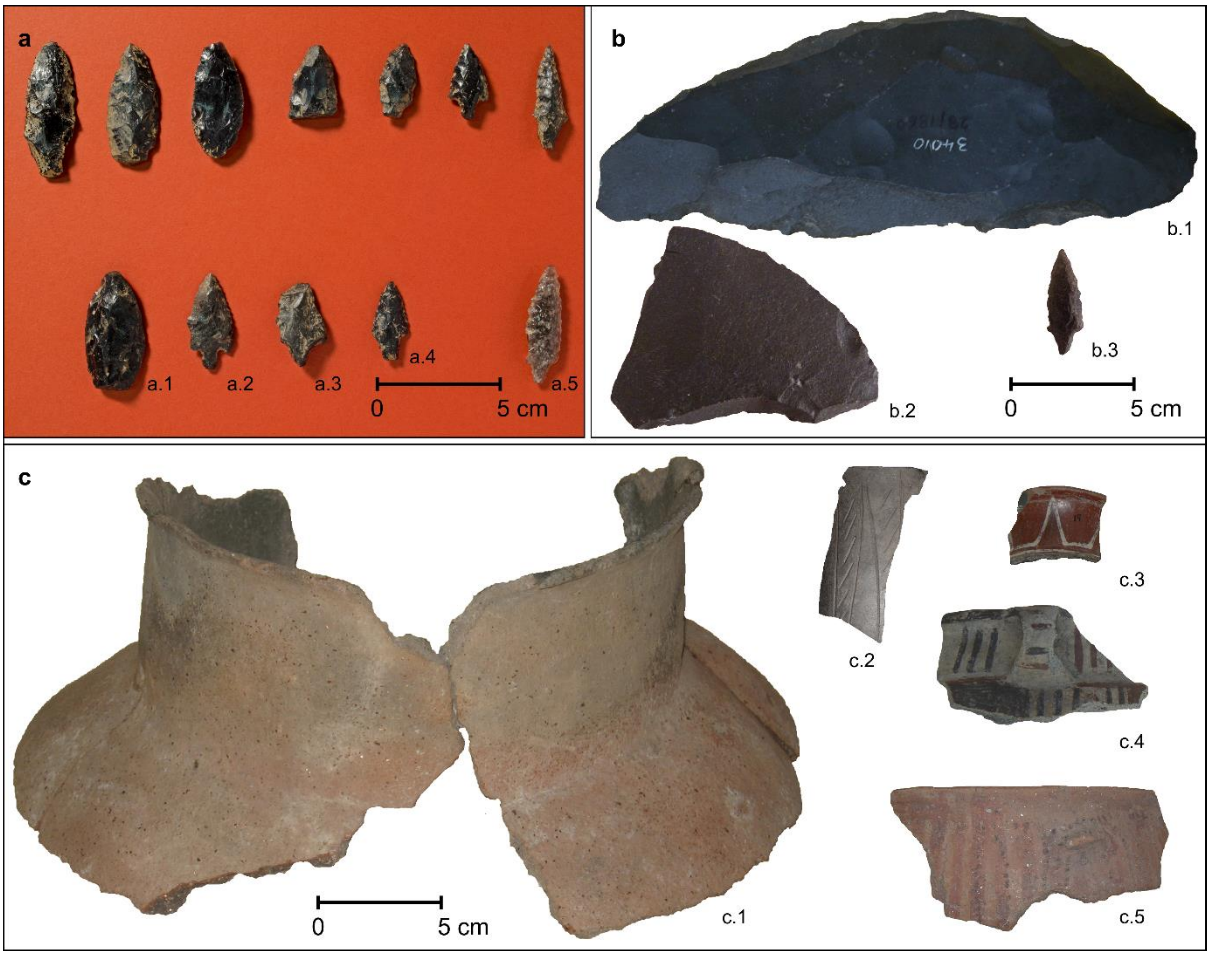

Figure 2 (A) Obsidian artifacts from Cajón: Cavi source (top row and A.1); Purulla source (A.2–A.4), and Ona source (A.5); photograph courtesy of Sean Goddard. (B) Volcanic rock artifacts: from Hualfín (B.1) [# 34010, Museo Etnográfico (U of Buenos Aires], Cajón (B.2) and Aconquija (B.3). (C) Ceramics: ordinary (C.1), polished grey incised (C.2), Condorhuasi (C.3) [UDM 6/R3, Museo de Antropología, U of Córdoba], Vaquerías (C.4), and Ciénaga Red on Buff (C.5) [# 32180, Museo Etnográfico, U of Buenos Aires].

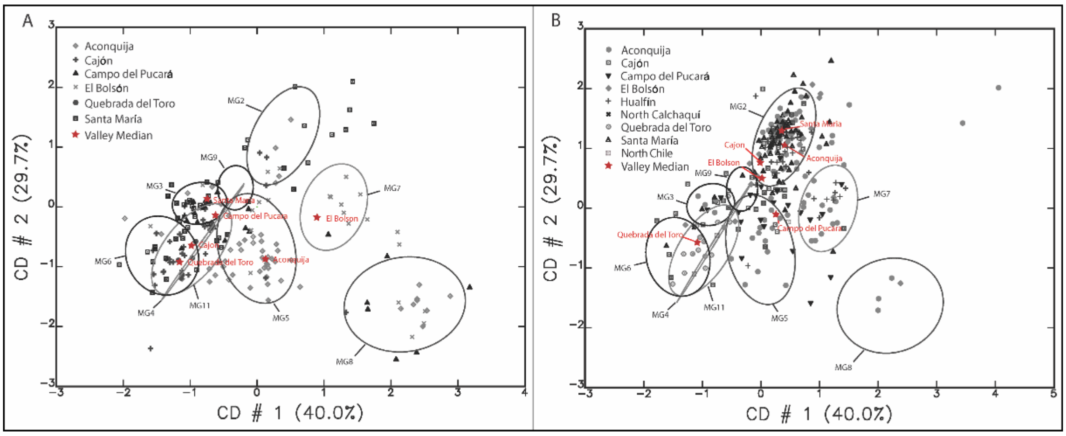

Figure 3 Bulk NAA chemical data for (A) ordinary wares and (B) decorated wares, coded by valley where samples were collected. Axes are canonical discriminant function #1 and #2. Ellipses represent 90 percent confidence intervals of membership within macrogrups. Data points represent chemical composition of individual samples. Red stars represent the median chemical composition for each valley. See Fig. SI 6 for elements that are determinant of canonical discriminant factors 1 and 2.

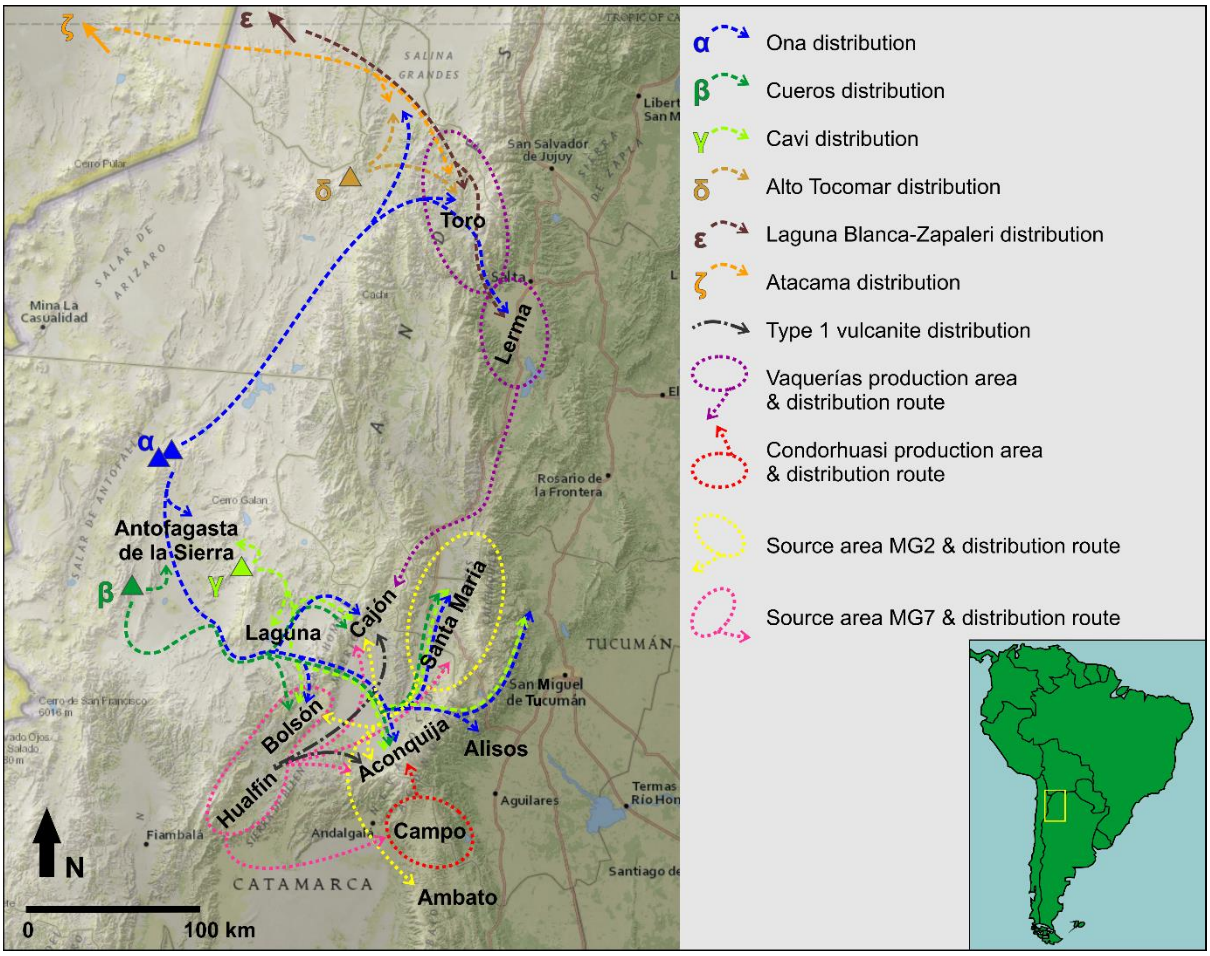

Figure 4 Distribution routes for obsidian sources, decorated MG2 and MG7 pottery wares, Vaquerías and Condorhuasi wares, and Type 1 vulcanite.

Supporting Information Appendix

Compositional data supports decentralized model of artefact production and circulation in the pre-Columbian Andes

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SECTION 1: MATERIALS AND METHODS

1.1. Northwestern Argentina's chronology and the temporal groups considered in this study

The traditional pre-Columbian chronology of NWA has been usually divided in the following way: Archaic or Pre-Ceramic Period (6000-1500 BC); Formative Period (c. 1500 BC to AD 600); Middle Period or Regional Integration period (AD 600- 1000); Regional Developments Period (also known as Late Period, AD 1000-1436); Inca Period (AD 1436-1536) (for variations in NWA's Formative period sequence according to different authors, and its relation to central and south-central Andean periods, see (1, 2)).

In order to better monitor variation in chemical group and source use throughout the period considered here, we segmented our sample in four temporal groups: T1 (400 BC- AD100), T2 (AD 100-450), T3 (AD 450-650) and T4 (AD 650-1000) (Table S1, Fig. S1). T1 includes material from outside our core study area, namely polychrome Vaquerías wares from Toro, following recent recalibrated dates by De Feo (3). The remaining temporal groups coincide with Scattolin's (1, 4-6) phases, which she proposed as part of a temporal scheme that could more accurately reflect the observed changes in our core study area, as well as in nearby archaeological areas in the eastern lowlands and western highlands, rather than NWA's master chronological sequence originally developed at Hualfín valley (7) and uncritically applied to NWA.

For the first millennium AD, Scattolin (4) proposes the following phases: *Chimpa* (AD 100-450), *Bañado* (AD 450-650), and *Colalao* (AD 650-900). These phases coincide with shifts observed in other regions but indicate an overall different pace of change while questioning the assumed orientation of cultural transmission, at least regarding ceramics.

Our temporal group 2 (T2) coincides with Scattolin's *Chimpa* phase, in which the regional stylistic universe consisted of mainly polished brown and grey surfaces. Surface decoration included incised, modelled and appliqué techniques, which predominated over painted ones. Painted Ciénaga wares (red on buff) are some of the few painted wares in this phase. This segment is also characterized by the continued presence of polychrome Vaquerías, and the emergence of polychrome Condorhuasi. While both wares display geometric painted decoration and modelled shapes (anthropomorphic and zoomorphic), they differ considerably in terms of the actual motifs deployed, the background color (in Vaquerías is white, in Condorhuasi is red), and the overall surface finish. Additionally, this phase sees the occurrence of large anthropomorphic bottle shapes with white slip, as well as effigy vessels with scarred/tattooed faces in relief, both anthropomorphic and zoomorphic. Many of these traits continued across the three phases, such as the effigy vessels decorated with incised, modeled and/or *appliqué* techniques, as well as the more generic polished grey/black/buff surfaces with incised decorations, suggesting the existence of a long-lasting stylistic *habitus* that considerably changes after AD 1000.

Temporal group 3 (T3) coincides with Scattolin's *Bañado* phase (which involves the increasing frequency of geometric decoration, such as polished grey incised wares and some engraved wares. Characteristic of this period are the grey engraved Ciénaga wares decorated with geometric patterns and angular zoomorphic motifs (monkeys, llamas). Polychrome painted ceramic disappears in this phase, but some painted decoration persists.

Temporal group 4 (T4) coincides with Scattolin's *Colalao* phase, when the engraved technique of decoration that started in the previous phase T3 becomes more popular. This phase is characterized by the presence of painted black on buff Ciénaga wares as well as polychrome Guachipas wares, a type of ceramics that had formerly been interpreted as "decadent Aguada." These vessels display similar paste quality and shapes than Aguada vessels, but the characteristic figurative motifs are absent. This places interesting questions on the nature of interaction between this area and those sites more clearly identified as part of Aguada.

1.2 Lithic materials: Sample details and analysis methods for obsidian and volcanic rock artefacts (vulcanite)

The study considered 74 obsidian artefacts, including projectile points, flake tools and debitage made with both translucent and opaque varieties of obsidian (Fig. 2 A). Selection was made following macroscopic appearance (attending to colour, degree of translucency, banding) in order to monitor whether such assessments are good predictors of source assignment. XRF was used on all of the obsidian samples in this study (n=74). Afterward, eleven of these samples were selected for a more intensive analysis by NAA, to distinguish between Cueros de Purulla and Chascón, another opaque obsidian source (Figs. 1, 4).

The obsidian artefacts come from the core study area, as well as Toro, Lerma, Laguna Blanca, and Alisos. Obsidian artefacts from other valleys included in this study were not available for analysis, but a large dataset on NWA obsidian is now available at MURR after decades of studies by our team and other colleagues already mentioned. Obsidian artefacts typically constitute 2-9% of lithic assemblages in the core study area. Table S2 includes our obsidian results, as well as the published results from previous studies (8-12).

The best elements for obsidian sourcing are the elements (Rb, Sr, Y, Zr, and Nb) and sometimes Fe and Zn, because they most often exhibit the greatest differences between obsidian sources. The XRF analysis of the obsidian artefacts described in this article was conducted using an energy dispersive XRF spectrometer. The table-top spectrometer was manufactured by the ElvaX company from the Ukraine. It is equipped with an air-cooled tungsten target anode X-ray tube with 140 micron Be window and a thermoelectrically cooled Si-PIN diode detector. The detector has a resolution of 180 eV for the 5.9 keV from iron. The beam dimensions are approximately 3 x 4 mm. In order to measure the elements in this study (K, Ti, Mn, Fe, Zn, Ga,Rb, Sr, Y, Zr, and Nb), the X-ray tube was operated at 40 kV using a tube current of 20-25 µA and count rate of 6,000 counts per second. Measurement times on all samples were 180 seconds. Peak deconvolution and element concentrations were accomplished using the ElvaX spectral analysis package. The instrument was calibrated using data from a series of well-characterized source samples in the MURR reference collection, including eleven Mesoamerican sources (El Chayal, Ixtepeque, San Martin Jilotepeque, Guadalupe Victoria, Pico de Orizaba, Otumba, Paredon, Sierra de Pachuca, Ucareo, Zaragoza, and Zacualtipan) and three Peruvian sources (Alca, Chivay, and Quispisisa). These sources were previously analysed by NAA and XRF in several laboratories to establish consensus values. Artefacts larger than 1 cm across are most suitable for analysis on the ElvaX table top XRF. Smaller samples require corrections and may be more appropriate for analysis using other XRF methods or by NAA.

Thirty-nine volcanic rock artefacts, very large side-scrapers of the so-called 'La Ciénaga basalt industry' (originally described in Hualfín (13)), were analyzed through NAA. These artefacts are found in various stages of reduction in domestic assemblages across the region during T2 and T3. These artefacts were selected not only on the bases of their raw material, which is quite distinctive in Formative period lithic assemblages, but also fragments that could be considered waste products of the reduction sequence of the large scrapers were especially selected. Various petrographic analysis on these artefacts have used different geological classifications for this raw material, ultimately leading to the adoption of the common term 'vulcanite' (Fig. 2 B).

Neutron activation analysis at MURR, which consists of two irradiations and a total of three gamma counts, constitutes a superset of the procedures used at most other NAA laboratories (detailed discussion in (14, 15). The analysis of lithic samples involves the removal of a small portion of the artefact (<0.5 grams) for irradiation. The sample is crushed into smaller fragments that will fit into vials. Samples for irradiation are prepared by weighing 100 mg of fragments into clean poly vials and 200 mg into high-purity quartz vials for short and long irradiations, respectively. Standards made from SRM-278 Obsidian Rock and SRM-1633b Flyash are similarly prepared. Short irradiations on samples and standards are conducted sequentially using a five-second irradiation in a neutron flux of 8x1012 n cm-2 s-1 followed by a 25-minute decay and 12-minute count which facilitate measurement of Al, Ba, Cl, Dy, K, Mn, and Na. Long irradiations are conducted on batches of 30-40 samples and standards irradiated for 48 hours in a neutron flux of 5x1012 n cm-2 s-1. Following irradiation the samples and standards are measured twice (i.e., after 7 and 21 days) to measure the medium- and long-lived isotopes. The medium lived isotopes measured are: Ba, La, Lu, Nd, Sm, U, and Yb. The long-lived isotopes measured are: Ce, Co, Cs, Eu, Fe, Hf, Rb, Sb, Sc, Sr, Ta, Tb, Th, Zn and Zr. Concentrations are determined by calculating the decay- and weight-corrected count rates of samples to standards for each element. Analytical uncertainties are approximately 1-2 percent for the best elements and range up to 10 percent for the least sensitive elements.

Compositional data of lithic materials were compared through the examination of bivariate plots to data obtained from previous studies of obsidian sources in NW Argentina. In general, the best elements for obsidian sourcing are the incompatible elements (Rb, Sr, Y, Zr, and Nb) and sometimes Fe and Zn, because they most often exhibit the greatest differences between obsidian sources.

1.3 Sampling and analysis methods for ceramic materials

The pottery sample includes both ordinary wares, defined as coarse-fabric pottery with smoothed non-decorated or minimally decorated surfaces. The sample also includes 'fine wares', typically smaller vessels with polished or painted surfaces. Two varieties, Condorhuasi and Vaquerías, have painted polychrome decoration. Besides these two types, the surface finishes of decorated wares include combinations from a repertoire of techniques that were widely available across the region: polished/incised/engraved grey; polished/incised black; polished/incised/engraved buff; painted buff; polished/incised red; modelled grey/buff/red wares; white slipped, to name but a few (1, 5, 16-18) (Fig. 2 C).

Eighty-two percent of the pottery samples come from securely excavated contexts; surface samples only include clearly identifiable 'diagnostic' pottery styles. Given the highly fragmented nature of the pottery assemblages, particular attention was dedicated to the selection of fragments to avoid the inclusion of potsherds from the same vessels. Fragments neck rims and other diagnostic parts of vessels were preferred instead of body fragments, and attention was paid to paste and surface treatment details to avoid repetition of vessels across potsherds.

Both ordinary and decorated wares were sampled for each region when possible. We emphasized the sampling fragments of large ordinary vessels that could have been used for cooking or storage and therefore less mobile (though in the Andes this needs to be carefully considered given ethnographic evidence of mobility of clays and all kinds of wares, see (19)). Ordinary fragments from museum surface collections were avoided, as it was not possible to ascertain their chronology.

Among decorated wares, we focused on sampling the most popular decorated styles (e.g., the ubiquitous polished incised grey styles that occur, with inter-valley variations, across the region) and ordinary types and shapes, but we also included less popular yet 'regionally diagnostic' samples (e.g., Condorhuasi, Vaquerías, Painted Ciénaga red on buff).

1.4 Petrography analysis

The methodology combined qualitative observation and description of mineral composition, matrix structure and voids, as well as quantitative analysis through point counting. While these fabrics show a continuum based on the frequency and size of the same minerals, some of them are mineralogically different. Petrographic analysis was conducted with a Leica DME-P polarized microscope and photographs were taken with a CANON Power Shot S80 camera with a 5x/0.12 objective. Petrographic study included the mineralogical identification of aplastic inclusions (20), the classification of structures in clay matrices (21), and their textural analysis (22). Records included measurements, forms and proportions of different types of inclusions, the latter through *point counting*. Petrography analysis was also conducted on modern experimental clay bricks as well as local sands potentially used for tempering.

The analysis followed four stages. The first one includes the description of the clay matrix and the aplastic elements smaller than 15 µm (21, 23). This background is characterised according to color and different matrix structures (pseudolepidoblastic, microgranular and/or cryptophillitic (21). Inclusions smaller than 15 µm cannot be safely identified through petrography. The second stage consists of the mineralogical characterization of inclusions larger than 15 µm. These were classified as crystaloclasts, that is, as fragments of individual crystals such as quartz, potassium feldspar, biotite, tourmaline, among others. This stage also detected lithoclasts, or rock fragments, with different origins (igneous, sedimentary or metamorphic). Other elements were also observed, such as opaque minerals, volcanic glass, clay granules and crushed potsherds. Clasts were classified as tabular, laminar, angular, sub angular, sub rounded, and rounded (24)). Size of inclusions was determined according to the Wentworth scale (24). The third phase consisted of observing and classifying voids in clay fabrics, recording their abundance, size and shape (rounded, long or irregular). This relates to the process of kneading and use of the vessel (24, 25). The fourth and last phase of analysis concerned the quantification of the modal distribution of components of the fabrics (matrix, inclusions and voids). To this end, a point counting of a minimum of 300 points per thin section was implemented, through the *multiple interception method*. Counting was done manually, with a graded scale added as accessory to the gyratory tray of the microscope. This stage also included the recording of the shapes and sizes of the aplastic inclusions and voids, considering their longest axis, using the micrometric scale of the microscope lens. The comparative analysis of the records of ceramic fabrics, together with the implementation of *cluster analysis*, enabled the generation of a typology based on both qualitative (i.e. structures in matrix, size and shape of inclusions and voids) and quantitative (matrix percentage, voids and aplastics) criteria.

Three main groups of fabric were identified on the bases of the presence of intentionally added aplastics (Fig. S2): Coarse, Intermediate and Fine. We therefore distinguish between fine fabrics (in the strict petrographic sense) and decorated wares (referring to pottery with polished/painted/incised/slipped surface treatment, whether with intermediate or fine fabrics).

Coarse fabrics: Intentionally added sand (33%-46% of fabric), wide granulometric range (between 15 µm and 4000 µm).

- **Fabric A** (West Aconquija Sierra): predominance of Qz and granitic lithoclasts.
- **Fabric A'** (Campo del Pucará): prodominance of Qz and granitic lithoclasts; and a lower proportion of schist.
- **Fabric B** (Santa María Valley): predominance of Qz, granitic lithoclasts, schist, and sandstone.
- **Fabric C** (Cajón Valley): predominance of migmate granitic lithoclasts, and Qz crystalloclasts with undulose extinction.
- **Fabric VC** (Quebrada del Toro): predominance of metamorphic rock (slate-phillite), sandstone, Qz crystallocasts.

Intermediate fabrics: Intentionally added sands (16%-33% of fabric) of diverse granulometric range (thick: 15 µm-2000 µm, and intermediate: 250 µm-1000 µm).

- **Fabric D** (West Aconquija Sierra): predominance of Qz and granitic lithoclasts.
- **Fabric D'** (Campo del Pucará): prodominance of Qz and granitic lithoclasts; and a lower proportion of schist.
- **Fabric E** (Santa María Valley): predominance of Qz, granitic lithoclasts, schist.
- **Fabrics G & H** (West Aconquija Sierra & Santa María Valley): predominance of Qz, granitic lithocast and schist but with limited granulometric range (500 µm-2000 µm).
- **Fabrics I & J** (West Aconquija Sierra, Cajón Valley, Campo del Pucará, Hualfín Valley & Santa María Valley): predominance of Qz and granitic lithoclasts. Fabric I is distinguished by the presence of pseudolepidoblastic background structure. Fabric J has criptophillitic background structure.
- **Fabric K** (West Aconquija Sierra, Hualfín Valley & Santa María Valley): predominance of Qz and volcanic lithoclasts and volcanic ash.
- **Fabric N** (Vaquerías intermediate fabric —Cajón Valley, Santa María Valley & Quebrada de Toro): Intentionally added aplastics (17%-26% of fabric) of intermediate granulomentric range (250 µm a 1000 µm). Predominance of metamorphic rocks (slate-phillite), Qz, ground potsherd, and sandstone.
- **Fabric N'** (Vaquerías intermediate fabric w/ Qz —Quebrada del Toro & Cajón Valley): Intentionally added aplastics (21%-27% of fabric) of intermediate granulomentric range (125 µm-1000 µm). Predominance of Qz and a lower proportion of metamorphic rocks (slate-phillite), sandstone and ground potsherd.

Fine fabrics:

- **Fabric L**: Intentionally added very fine (30 µm-250 µm) aplastics (10% - 30% of fabric) found in all valleys and surface styles.
- **Fabric M**: Only natural aplastics from the clay, also found in all valleys and surface styles.

1.5. Experimental clay samples

In order to test the patterns observed in the petrographic analysis of archaeological fabrics, a selection of experimental samples were prepared with different clays and aplastics (sands obtained from seasonally active rivers and stream beds nearby particular sites. A total of 24 clay bricks were made, with clays collected at Cardonal A, Cardonal B, Yutopián, Arcillas Verdes, La Aspereza, Quebrada de Jujuil, Los Colorados, Palo Pintado, Las Conchas and Guachipas (Fig. 1). These bricks were made with different proportions of clay and aplastics. Some of them remained raw, while others were fired at 650° C and 900° C.

The comparison of archaeological samples with experimental samples focused on coarse fabrics and fabrics with intentionally added aplastics. The results highlighted the similarities between both assemblages, particularly in the structure of the fabric matrix (pseudolepidoblastic) as well as in the granulometric range and the percentage of aplastics.

These bricks, together with an additional brick made with Los Colorados clay previously fired at 500° C, were submitted to MURR for NAA in order to assess whether variations in clay and aplastic proportion, as well as firing process, affected the chemical composition of the samples. The results show that these combinations do not affect the chemical composition of the samples (see below, section 1.7).

1.6 Sample preparation for INAA of pottery

Pottery and clay samples were prepared for INAA using procedures standard at MURR. Fragments of about 1 cm2 were removed from each sample and abraded using a silicon carbide burr in order to remove glaze, slip, paint, and adhering soil, thereby reducing the risk of measuring contamination. The samples were washed in deionized water and allowed to dry in the laboratory. Once dry, the individual sherds were ground to powder in an agate mortar to homogenize the samples. Archival samples were retained from each sherd (when possible) for future research.

Two analytical samples were prepared from each source specimen. Portions of approximately 150 mg of powder were weighed into clean high-density polyethylene vials used for short irradiations at MURR. At the same time, 200 mg of each sample was weighed into clean high-purity quartz vials used for long irradiations. Individual sample weights were recorded to the nearest 0.01 mg using an analytical balance. Both vials were sealed prior to irradiation. Along with the unknown samples, Standards made from National Institute of Standards and Technology (NIST) certified standard reference materials of SRM-1633a (coal fly ash) and SRM-688 (basalt rock) were similarly prepared, as were quality control samples (e.g., standards treated as unknowns) of SRM-278 (obsidian rock) and Ohio Red Clay (a standard developed for in-house applications).

1.7 Pottery NAA: Irradiation and gamma-ray spectroscopy

Neutron activation analysis of ceramics at MURR, which consists of two irradiations and a total of three gamma counts, constitutes a superset of the procedures used at most other NAA laboratories As discussed in detail by Glascock (14) ,a short irradiation is carried out through the pneumatic tube irradiation system. Samples in the polyvials are sequentially irradiated, two at a time, for five seconds by a neutron flux of 8 x 1013 n cm-2 s-1. The 720-second count yields gamma spectra containing peaks for nine short-lived elements aluminum (Al), barium (Ba), calcium (Ca), dysprosium (Dy), potassium (K), manganese (Mn), sodium (Na), titanium (Ti), and vanadium (V). The samples are encapsulated in quartz vials and are subjected to a 24–hour irradiation at a neutron flux of 5 x 1013 n cm-2 s-1. This long irradiation is analogous to the single irradiation utilized at most other laboratories. After the long irradiation, samples decay for seven days, and then are counted for 1,800 seconds (the "middle count") on a high-resolution germanium detector coupled to an automatic sample changer. The middle count yields determinations of seven medium half-life elements, namely arsenic (As), lanthanum (La), lutetium (Lu), neodymium (Nd), samarium (Sm), uranium (U), and ytterbium (Yb). After an additional three- or four-week decay, a final count of 8,500 seconds is carried out on each sample. The latter measurement yields the following 17 long half-life elements: cerium (Ce), cobalt (Co), chromium (Cr), cesium (Cs), europium (Eu), iron (Fe), hafnium (Hf), nickel (Ni), rubidium (Rb), antimony (Sb), scandium (Sc), strontium (Sr), tantalum (Ta), terbium (Tb), thorium (Th), zinc (Zn), and zirconium (Zr). The element concentration data from the three measurements are tabulated in parts per million.

For NAA of pottery, the quality controls are samples of obsidian (SRM-278) and New Ohio Red Clay. By checking the reproducibility of the New Ohio Red Clay, we can assume that our unknowns are just as precise. The New Ohio Red Clay has been measured with every batch of 50 pottery samples more than 2000 times, which forms the basis of the uncertainty measurements. Table S7 shows the uncertainty (in percentage) of values measured in ceramics by NAA, while Table S8 shows the detection limits of elements for ceramics.

1.8 LA-ICP-MS: Instrumentation and methods

Laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) was conducted with a PerkinElmer SCIEX NexION 300 Quadrupole ICP-MS coupled with a Photon-Machines Inc. laser. Methods generally follow Speakman and Neff (26), but adjustments were made for the newer instrumentation. Samples were cut into chips less than 4 x 4 x 1 mm size and fitted on a standard thin section slide with the use of poster tack. A camera displays the sample area on the computer screen at high magnification. The analysts can then target the laser to ablate specific components of the sample. The laser was set to ablate at least 6-12 lines measuring 100 µm each with a circular spot size of 40 µm. After each line ablation, the laser was paused for 20 seconds while the ICP-MS continues to collect data. The laser moves at a rate of 5 µm/s firing laser bursts at a rate of 30/s. Laser power was to 40 percent of the maximum. The ablated sample vapor travels through tubing in a helium transport agent. It is mixed with argon gas at the ICP-MS torch, where the sample is ionized and passes through two detectors that measure the intensity of the signal in terms of counts per second. The pulse detector is generally more accurate and precise for non-major elements, but the detector saturates at a relatively low intensity. The analog detector takes over for elements of greater intensities. The ICP-MS was run in dual detector mode and transitions between detectors are corrected using a conversion factor.

The method developed by Barry Higgins and Wesley D. Stoner for analysis of archaeological pottery collects data for 39 elements: the same list as above for NAA plus silicon (Si), copper (Cu), magnesium (Mg), tin (Sn), ytterbium (Yb), and lead (Pb). The detector is set for a dwell time of 10 ms/isotope with only a single sweep and a single reading per replicate. The number of replicates changes depending of the number of lines ablated and the material targeted.

Switching the laser on and off for a pause of 20 seconds between scans forms a series of curves for each isotope. Each peak represents a single ablated line, whereas the baseline between peaks serves as the sample blank. In Microsoft Excel, Higgins and Stoner have developed a macro script that automatically subtracts the sample blank (the average of 10 baseline replicates both before and after the sample peak) from each replicate (represented by individual rows in the Excel spreadsheet). The blank-subtracted replicates within each peak are summed and averaged over however many lines were ablated within the specimen. At this stage, anomalous peaks can be identified and eliminated to avoid a single peak from skewing the data.

Average data of element isotopes in counts per second is then corrected to total elemental signal using isotopic abundance ratios. At this point, we employ a modified standardization method developed by Gratuze and associates (27). Elemental data is expressed as a ratio to an internal standard appropriate for the sample matrix. For pottery, Si is used as the internal standard because it is a stable and immobile major element that it very abundant in all pottery. Aluminum could also be used. The ratio expression is referred to as the standard signal.

The standard signal is then referenced to published values for standard reference materials to arrive at the *Ky:*

$$Ky = \frac{Standardized\ signal\ for\ Y}{[Y]in\ the\ reference\ material} * [internal\ standard]in\ the\ reference\ material$$

Where *K* is the conversion factor for element *y*. The standard signal is then divided by the *Ky* and the sum of all elements is normalized to 100 percent oxide. Finally, we apply standard geochemical coefficients to remove oxygen from all elemental concentrations, leaving the all data in parts-per-million.

1.9 Interpreting chemical data

Nickel (Ni) was removed from all NAA statistical techniques due to the high number of missing values within the dataset. No elements were eliminated from the LA-ICP-MS dataset.

Statistical analysis was carried out on base-10 logarithms of concentrations for all elements. Use of log concentrations rather than raw data compensates for differences in magnitude between the major elements, such as calcium, on one hand and trace elements, such as the rare earth or lanthanide elements (REEs). Transformation to base-10 logarithms also yields a more normal distribution for many trace elements.

The interpretation of compositional data obtained from the analysis of archaeological materials is discussed in detail elsewhere (14, 15, 28-30) and will only be summarized here. The main goal of data analysis is to identify distinct and relatively homogeneous groups within the analytical database. Based on the provenance postulate of Weigand et al. (31), different chemical groups may be assumed to represent geographically restricted sources. With pottery, however, chemical composition additionally varies according to the paste recipes that potters employ. A paste recipe reflect the cumulative pottery production steps from the selection of raw materials, preparation of those materials, the mixing of temper and clay, and even the firing of the pottery can affect the final recipe as changes in color and mineral structure can take place. For lithic materials such as obsidian, basalt, and cryptocrystalline silicates (e.g., chert, flint, or jasper), raw material samples are frequently collected from known outcrops or secondary deposits and the compositional data obtained on the samples is used to define the source localities or boundaries. The locations of sources can also be inferred by comparing unknown specimens (i.e., ceramic artifacts) to knowns (i.e., clay samples) or by indirect methods such as the "criterion of abundance" (32) or by arguments based on geological and sedimentological characteristics e.g., (33). The ubiquity of ceramic raw materials usually makes it impossible to sample all potential "sources" intensively enough to create groups of known to which unknowns can be compared. Lithic sources tend to be more localized and compositionally homogeneous in the case of obsidian or compositionally heterogeneous as is the case for most cherts.

Compositional groups can be viewed as "centers of mass" in the compositional hyperspace described by the measured elemental data. Groups are characterized by the locations of their centroids and the unique relationships (i.e., correlations) between the elements. Decisions about whether to assign a specimen to a particular compositional group are based on the overall probability that the measured concentrations for the specimen could have been obtained from that group.

Initial hypotheses about source-related subgroups in the compositional data can be derived from non-compositional information (e.g., archaeological context, decorative attributes, etc.) or from application of various pattern-recognition techniques to the multivariate chemical data. Some of the pattern recognition techniques that have been used to investigate archaeological data sets are cluster analysis (CA), principal components analysis (PCA), and discriminant analysis (DA). Each of the techniques has its own advantages and disadvantages which may depend upon the types and quantity of data available for interpretation.

The variables (measured elements) in archaeological and geological data sets are often correlated and frequently large in number. This makes handling and interpreting patterns within the data difficult. Therefore, it is often useful to transform the original variables into a smaller set of uncorrelated variables in order to make data interpretation easier. Of the above-mentioned pattern recognition techniques, PCA is a technique that transforms from the data from the original correlated variables into uncorrelated variables most easily.

PCA creates a new set of reference axes arranged in decreasing order of variance subsumed. The individual PCs are linear combinations of the original variables. The data can be displayed on combinations of the new axes, just as they can be displayed on the original elemental concentration axes. PCA can be used in a pure pattern-recognition mode, i.e., to search for subgroups in an undifferentiated data set, or in a more evaluative mode, i.e., to assess the coherence of hypothetical groups suggested by other criteria. Generally, compositional differences between specimens can be expected to be larger for specimens in different groups than for specimens in the same group, and this implies that groups should be detectable as distinct areas of high point density on plots of the first few components. It is well known that PCA of chemical data is scale dependent, and analyses tend to be dominated by those elements or isotopes for which the concentrations are relatively large. This is yet another reason for the log transformation of the data.

One frequently exploited strength of PCA, discussed by (15, 28, 34, 35) is that it can be applied as a simultaneous R- and Q-mode technique, with both variables (elements) and objects (individual analyzed samples) displayed on the same set of principal component reference axes. A plot using the first two principal components as axes is usually the best possible two-dimensional representation of the correlation or variance-covariance structure within the data set. Small angles between the vectors from the origin to variable coordinates indicate strong positive correlation; angles at 90 degrees indicate no correlation; and angles close to 180 degrees indicate strong negative correlation. Likewise, a plot of sample coordinates on these same axes will be the best two-dimensional representation of Euclidean relations among the samples in log-concentration space (if the PCA was based on the variance-covariance matrix) or standardized log-concentration space (if the PCA was based on the correlation matrix). Displaying both objects and variables on the same plot makes it possible to

observe the contributions of specific elements to group separation and to the distinctive shapes of the various groups. Such a plot is commonly referred to as a “biplot” in reference to the simultaneous plotting of objects and variables. The variable inter-relationships inferred from a biplot can be verified directly by inspecting bivariate elemental concentration plots. [Note that a bivariate plot of elemental concentrations is not a biplot]
Whether a group can be discriminated easily from other groups can be evaluated visually in two dimensions or statistically in multiple dimensions. A metric known as the Mahalanobis distance (or generalized distance) makes it possible to describe the separation between groups or between individual samples and groups on multiple dimensions. The Mahalanobis distance of a specimen from a group centroid (18, 26) is defined by:

$$D^2_{y,X} = [y - \overline{X}]^t I_x [y - \overline{X}]$$

where *y* is the 1 x m array of logged elemental concentrations for the specimen of interest, *X* is the n x m data matrix of logged concentrations for the group to which the point is being compared with *X* being it 1 x m centroid, and *x I* is the inverse of the m x m variance covariance matrix of group *X*. Because Mahalanobis distance takes into account variances and covariances in the multivariate group it is analogous to expressing distance from a univariate mean in standard deviation units. Like standard deviation units, Mahalanobis distances can be converted into probabilities of group membership for individual specimens. For relatively small sample sizes, it is appropriate to base probabilities on Hotelling’s 2 *T*, which is the multivariate extension of the univariate Student’s *t*.

When group sizes are small, Mahalanobis distance-based probabilities can fluctuate dramatically depending upon whether or not each specimen is assumed to be a member of the group to which it is being compared. Harbottle (36) calls this phenomenon “stretchability” in reference to the tendency of an included specimen to stretch the group in the direction of its own location in elemental concentration space. This problem can be circumvented by cross-validation, that is, by removing each specimen from its presumed group before calculating its own probability of membership (37, 38). This is a conservative approach to group evaluation that may sometimes exclude true group members.

Small sample and group sizes place further constraints on the use of Mahalanobis distance: with more elements than samples, the group variance-covariance matrix is singular thus rendering calculation of *x I* (and 2 *D* itself) impossible. Therefore, the dimensionality of the groups must somehow be reduced. One approach would be to eliminate elements considered irrelevant or redundant. The problem with this approach is that the investigator’s preconceptions about which elements should be discriminate may not be valid. It also squanders the main advantage of multielement analysis, namely the capability to measure a large number of elements. An alternative approach is to calculate Mahalanobis distances with the scores on principal components extracted from the variance-covariance or correlation matrix for the complete data set. This approach entails only the assumption, entirely reasonable in light of the above discussion of PCA, that most group-separating differences should be visible on the first several PCs. Unless a data set is extremely complex, containing numerous distinct groups, using enough components to subsume at least 90% of the total variance in the data can be generally assumed to yield Mahalanobis distances that approximate Mahalanobis distances in full elemental concentration space.

Lastly, Mahalanobis distance calculations are also quite useful for handling missing data (39). When many specimens are analyzed for a large number of elements, it is almost certain that a few element concentrations will be missed for some of the specimens. This occurs most frequently when the concentration for an element is near the detection limit. Rather than eliminate the specimen or the element from consideration, it is possible to substitute a missing value by replacing it with a value that minimizes the Mahalanobis distance for the specimen from the group centroid. Thus, those few specimens which are missing a single concentration value can still be used in group calculations.

Benefits of multi-technique analyses

The bulk composition data produced by NAA presents a holistic view of pottery composition. It is the sum of all materials mixed together by the potter (temper, clay, natural inclusions) plus chemical alterations caused by use of the pottery and post-depositional diagenesis. While NAA is the most accurate, precise, and standardized technique to determine the concentration of many elements (14, 15) the bulk nature of the data provides some limitations. Several studies have shown that significant variation in one component of a ceramic paste (temper, clay, natural inclusions) may be reduced or masked by another (40-44). In many cases, chemical information on a specific component of the ceramic paste may provide information on potting behavior or provenance that NAA cannot. Using laser ablation as the sample introduction mechanism for ICP-MS allows the analyst to obtain data for specific components of the paste. It is *the most direct method* of characterizing the clay used to produce pottery. Multi-technique analyses almost always produce complementary results and permit more robust arguments.

1.10 Analysis and interpretation of pottery chemical data

Northwest Argentina is a difficult region to employ compositional analyses of pottery because most of the sediments suitable for pottery production form through weathering and run off of similar parent materials in the mountains. While chemical differences among the raw materials used to manufacture pottery appear across space within interior drainage basins, these differences tend to be very subtle due to the mixing of sediments. Because of the difficulties of chemical sourcing in this region, we employed a staged analysis. The present study continues with a series of previous studies conducted at the MURR laboratory on samples submitted by the lead author of this article (45-47) which were all consulted, but the larger sample available at this time merited some changes to the group structure. For this reason, the current chemical groups were constructed blindly, with no reference to previous groups. The new group structure was later compared to the old structure and the names of groups were modified to ensure consistency across the three analyses.

The first stage of analysis was to create core reference groups. Core reference groups consist of closely related specimens that form a coherent cluster that consistently differs from other groups regardless of the statistical techniques employed. Core reference groups were formed based on hierarchical cluster analysis (HCA), principal components analysis (PCA), and inspection of elemental plots. The core reference groups were then validated by jack-knifed Mahalanobis Distance-based probabilities, which led to minor adjustments. In total, only 236 specimens were assigned to core groups, 43% of all ancient pottery submitted for analysis.

Second, a canonical discriminant analysis (CDA) was conducted on the core reference groups and used these discriminant functions to assign the remaining specimens to the best group. One must exercise caution when using and interpreting CDAs (48). Unlike PCA, which does not change the relation among specimens in multidimensional elemental space, CDA rescales the data by "building linear combinations of the original variables that maximize between to within group variance (48). CDA only uses the variables of significance to rescale the data, so a large portion of the data is ignored. Additionally, the reference groups that CDA uses to rescale the variance are previously established by the analyst. If the reference groups entered into the analysis do not accurately represent chemically distinct clusters, the analysis will lead to false assignment of unknowns to unrelated groups. This is the reason for the narrowly defined core reference groups, discussed above. With all of these problems in mind, when properly applied, CDA provides a measure of group membership in difficult sourcing regions where other techniques may fail to confidently assign specimens to groups. CDA provided the basis to create macrogroups for each core group. Whereas core groups represent a very conservative group structure, macrogroups represent a more liberal assignment of unknown samples into reference groups. A specimen is assigned to a macrogroup if it has more than 1 percent probability of belonging to a core group *and* more than three times higher probability than the probability of belonging to any other group.

Because the chemical separation of groups will likely continue to blur with the addition of more samples from the region, future analyses must maintain the *core* reference groups as those whose members possess a very high probability of group membership. After forming macrogroups, we make final adjustments to the resultant group structure using PCA, HCA, and inspection of elemental concentrations. The Core Groups are distinguished on the bases of the following characteristics:

Core Group 1 (Ambato) (n=0)

The Ambato reference group was defined through a sample of ceramics from the Valley of the same name (49, 50). Speakman and Glascock (36) placed two of the specimens into the Ambato Group (see (11)), but upon further inspection, those two specimens may not be good matches with Ambato. The Ambato reference group is chemically similar to Core Group 3 (see below), but tends to be higher in Hf, As, Sb, Sr, Zr, and most rare earth elements. Ambato ceramics are typically low in Rb, Cs, Ta, and Ca. This result is confirmed by a PCA and Mahalanobis distance-based probabilities. These two groups are very difficult to distinguish, but on average the two specimens previously assigned to Ambato appear to be more chemically similar to Core Group 3. Furthermore, while some specimens within the current sample fall into the chemical range of the Ambato reference group on a few elemental axes, no single specimen consistently plots within the Ambato reference group. Given that the Ambato reference group is very chemically homogeneous and well defined, we are confident that none of the ceramics in the current study were produced in the Ambato Valley. It is clear that there is a chemical difference between Core Group 3 and Ambato that must be further evaluated through future analyses.

Core Group 2^{NAA} (n=73)

Core Group 2 contains the highest number of specimens. In fact, this group formulates the modal chemical composition for the entire sample, with the other groups representing derivations from the norm. Group 2 presents high concentrations among the transition metals (e.g., Fe, Cr, Co, Mn, Zn) and the Alkaline earth metals Ca and Sr. It displays low concentrations of Cs, Rb, As, and Sb and REEs.

Core Group 3^{NAA} (n=39)

Core Group 3 contains among the lowest concentrations of the same elements enriched in Group 8 (Cs, Rb, and Ta), but possesses high values for Hf and Zr. The abundance of these two elements are usually correlated and they are both associated with zircon crystals often found in granites, felsic igneous rocks, and quartz sands. Group 3 is not alone in possessing relatively high Hf and Zr concentrations, but it differs from Groups 5 and 6 based on its relatively low REE concentrations.

Core Group 4^{NAA} (North Chile) (n=3)

A total of four specimens from north Chile were submitted for analysis. Three of these clearly differentiate based on high values for As, Sb, Ba, Ca and Sr, but low values for most REEs and transition metals. These three specimens are clearly different from the samples from northwest Argentina. The fourth specimen is not a good chemical match to any of the groups discussed here, including Group 4.

Core Group 5^{NAA} (n=35)

Core Group 5 discussed in this report replaces the Group 5 defined by Speakman and Glascock (2012). Originally, specimens LAZ074, LAZ100, LAZ102, and LAZ115 made up Group 5, but these four specimens together do not form a chemically coherent group. Furthermore, they are better characterized as chemical outliers of Core Group 2. Currently Group 5 is replaced by specimens that display relatively low values for transition metals (Co, Cr, Fe, Mn, Sc, V, Zn) and Ca, but high concentrations of As, Hf, Ta, and Zr. Core Group 5 is also slightly above average in REE concentrations.

Core Group 6^{NAA} (n=23)

Core Group 6 contains the highest values of Hf, Zr, and most REEs. It also has higher than average levels of transition elements and As. However, Group 6 contains among the lowest values of Cs, Rb, Ta, and U. Defined as such, Group 6 is the chemical opposite to Group 8 in this dataset.

Core Groups 7^{NAA} (n=14) and 8^{NAA} (n=22)

Core Groups 7 and 8 share the same chemical characteristics but differ in the degree of their valuation. Both display elevated levels of Cs, Rb, Ta, and U, but depleted Hf and Zr. They both also contain below average concentrations of the transition metals, with Group 8 representing the extreme low of transition metal concentrations in the sample. Group 8 is characterized by a very large amount of internal chemical variability. Group 8 may therefore be better thought of as chemical outliers to the main sample rather than a cohesive grouping. This pattern may form through post-depositional chemical alteration, but there is currently no way to evaluate this hypothesis. Ions of Cs and Rb readily substitute for one another in the structure of many sheet silicates, which includes clays and micas. In particular, the phyllosilicate lepidolite (of the mica group) is often enriched in both of these elements. If these specimens contain high percentages of mica, this might explain their enrichment in Cs and Rb. Support for the presence of lepidolite may come in terms of a high percentage of mica in the Group 8 specimens through the petrographic analysis. However, petrographic analysis only detected 2-7% (biotite and muscovite) of mica in Group 8 samples. It is possible that mica elements are finely divided into the paste as part of the clay, but also mica (biotite and muscovite) appears in the granite rocks that were used as aplastics in MG8 fabric.

Core Group 9^{NAA} (n=13)

Core Group 9 is small, but chemically coherent and distinct due to its high levels of Ca and Sb. Forshadowing the LA-ICP-MS results, the clays used to produce Core Group 9 ceramics are high in Ca while the temper is high in Sb. All of the specimens in Core Group 9 are of the Vaquerías ware.

Core Group 10^{NAA} (n=0)

Boulanger and Glascock (34) defined a Group 10 in an earlier analysis (n=12). Only seven of these samples form a coherent chemical group while the remainder is considered for the moment as chemical outliers. The seven that form a coherent cluster are chemically indistinguishable from Core Group 3 and were merged into said group. This change results from the addition of new samples which permitted the better definition of Core Group 3. We currently do not assign any specimens to Core Group 10, but leave the position open in the event that future analyses validate its status as a chemical group.

Core Group 11^{NAA} (n=16)

Core Group 11 is the only group newly created in the current analysis. It consists almost entirely of samples from Quebrada del Toro. Core Group 11 is high in As, Sb, and transition metals, but low in Ca and Sr. As a whole, Group 11 is rather chemically distinct, but it has a lot of internal variation. Sampling more ceramics from Quebrada del Toro in the future may lead to better definition of this group. Not all ceramics from this region fall into Group 11, but most do share its chemical characteristics to some degree.

Unassigned (n=310)

At this stage of analysis, a high proportion of specimens remain purposefully unassigned. While most of these are assigned to macro groups below, it should be noted here that the overwhelming majority of these cluster around Groups 2, 4, and 5. In total 56 percent of all ancient ceramics remain unassigned at this point.

1.10.1 Placement of Unassigned Specimens into Macrogroups

The core reference groups were entered into a canonical discriminant analysis to associate the unassigned samples with the best core group. Probability of group membership is calculated from Mahalanobis distance-based probabilities of the first 5 discriminant functions, explaining over 95 percent of the variability in the sample. The resultant group formations are called “macrogroups” (expressed as MG#) because they project the best group assignment even if the probability of membership is relatively low. Because the chemical separation of groups will likely continue to blur with the addition of more samples from the region, future analyses must maintain the *core* reference groups as those whose members possess a very high probability of group membership. After forming macrogroups, we make final adjustments to the resultant group structure using PCA, HCA, and inspection of elemental concentrations. Table S9 shows the mean and coefficient of variation (CV) for every macrogroup. The final CV is calculated across groups

The current assignments accord fairly well with the group structure identified through previous analyses. MG2, MG4, MG6, and MG8 agree strongly across the different analyses. The two specimens previously included into the Ambato Reference group actually fall in to MG3. Old Group 3 defined by Speakman and Glascock (46) was divided and most specimens were moved to MG5. Old Group 5, which previously consisted only of four outlier specimens, was completely redefined in the current study. Old Group 7 specimens were split up primarily into MG2 and MG7. MG2 has two main subgroups, MG2a and MG2b, which mainly include samples from Aconquija/Santa María and Hualfín respectively. The Hualfín dominated MG2b is closer in composition to MG7, but the MG2b and MG7 are completely distinct based on many elements (Cs, Rb, K, Sr, Ta). New MG7 is different from old Group 7, as the latter is closer to new MG2, given that several samples plot solidly within the centre of new MG2. This exemplifies our need to introduce major restructuring in the existing chemical groups. Figure S5 C shows the distribution of MG2 samples in subgroups.
Old Group 9 was also split up. Most of the Vaquerías wares remained in MG9 because this ware consistently demonstrates rather distinct chemistries in the sample. Those that did not fit with the major cluster of Vaquerías ceramics resembled the MG2 Fine Wares. This issue is clarified with the LA-ICP-MS discussion below. Old Group 10 really did not hold together as a robust chemical group with the addition of the new samples, so we reassigned those specimens. However, we left the “Group 10” category open.

Table S10 and Figure S6 below show the discriminant factor loadings for the first four Canonical Discriminant factors (CDs). High numbers mean those elements more greatly affect the value on that factor. High positive loadings mean that the elemental composition and the CD value are positively correlated. High negative values meant that the elemental composition and the CD value are inversely related. The top three positive and negative elements for each discriminant factor are highlighted in **bold.**

1.10.2. Assignment of clay samples to macrogroups

The study analysed clays from 10 known clay sources, from Cajón (4 sources), Aconquija (1), Santa María (1), Los Colorados (Amaicha), Las Conchas y Palo Pintado (Cafayate) and La Viña (Guachipas Valley). We also included two modern pottery, one from La Viña and one from Las Conchas, and two samples of archaeological raw clays from the site Soria 2 (51) (Fig.1).

The analysis suggests that some clays match some of the groups, but further studies are needed to confirm this trend. Clay samples from Los Colorados (LAZ174) are close to MG6, which has a majority of intermediate and ordinary wares from Cajón and fine wares from Santa María, with a few samples from Aconquija and Bolsón. Clays from Las Conchas (LAZ173 and LAZ531) and La Viña (LAZ528 and LAZ529) are chemically close to MG2, on CD1 and CD2 but CD3 removes them from MG2. Clay samples from Quebrada de Jujuil approximate MG3, which mainly contains ordinary wares from Santa María. One clay sample from La Aspereza (Aconquija) approximates MG8, which is mainly composed of ordinary wares from Aconquija and Campo.

While we cannot be certain that the ancient potters chose the same clays that were samples for this study, it appears that the samples collected from known clay banks resemble primarily ordinary pottery from many of the areas. This confirms a predominant trend of selecting local clays to make utilitarian pottery. The chemical differences between ceramics and clay for each region likely results from the addition of aplastic materials to temper the paste or the removal of other aplastics. Figure S5 B shows the relationship between clay samples and chemical groups.

1.11. LA-ICP-MS results

The LA-ICP-MS results largely confirm the NAA results, but provide additional interpretive advantages. Most importantly, it provides chemical data on the clay, temper, and pigment fractions separately.

The LA-ICP-MS data measure something different than the bulk NAA data. While the bulk data consider the clay, temper, and inclusions all mixed together, the LA-ICP-MS targets specific components individuals. Therefore, we cannot use the same group designations as the NAA data. Instead, we opt to use letters for groups here.

1.11.1 Clay Fraction

The clay fraction of the subsample (n=96) displays five distinct chemistries (Table S6 and Fig. S7).

Group ICP-A

Group ICP-A separates based on relatively high levels of Ca and Sr, but low concentrations of Cs, Ta, Rb. Rare earth and transition metal levels are intermediate. Group AICP clays contain about 2 percent more Ca than the other clays, suggesting that it may be composed of a different type of clay mineral. All of the ceramics in Group ICP-B are of the Vaquerías ware. Moreover, all the Vaquerías samples, except for one specimen recovered in the Cajón Valley, were assigned to this group.

Group ICP-B

Group ICP-B is lower in almost all of the elements measured relative to the other three groups. The only two elements that display higher than average concentrations in Group BICP are Si and Ti. Silicon within this group, in particular, is between 1-4 percent higher than all other groups. This might indicate a higher proportion of quartz ($SiO2$) finely divided into the clay matrix, suggesting use of a quartz-laden clay. The higher Si could account for the lower concentrations of other elements through dilution. Ninety-three percent of the Condorhuasi ceramics in the LA-ICP-MS sample resemble Group ICP-B. The remaining one Condorhuasi specimen falls in Group ICP-E. Group ICP-B also contains 77 percent of the ordinary samples from Campo del Pucará, supporting the hypothesis that the Condorhuasi wares from West Aconquija Sierra and Campo del Pucará were manufactured in the latter area. The group also contains a minority of other ceramic types as well, including one Vaquerías sample from Cajón Valley that was probably a local emulation of the style. It should be noted that this sample has the same petrography as the Vaquerías samples in ICP-A

Group ICP-C

Group ICP-C exhibits high REE concentrations, particularly Eu and Sm. It also displays above average transition metal (particularly Ni) and As concentrations. As for the major composition of the clays, Group ICP-C contains the lowest Si concentrations and the highest Al concentrations. It is possible that the clays used to produce these ceramics contained either gibbsite or kaolinite minerals, which both carry Al+3 cations (as opposed to Fe or Mg, for example) in their octahedral layers. Group ICP-C contained 45 percent of all the ordinary wares and all of the intermediate wares, however no ordinary wares from Campo del Pucará are included in this group. No other ceramic types fit chemically within this group.

Group ICP-D

Group ICP-D contains only 4 sherds, all of which are from Quebrada del Toro. This group is similar to the ceramics from North Chile in that they are high in As.

Group ICP-E

Group E contains only 5 samples, all of which are from Campo del Pucará. This group consists of ceramics that are unusually high in Rb and Cs. Four of the five specimens in this group were assigned to MG8 while one was left unassigned in the bulk chemical dataset. MG8 was also defined based on its extreme values of Cs and Rb, suggesting that the bulk chemistry of this group is greatly affected by the clay fraction. The mica flakes in these ceramics are very high in these elements, as well as Ta and As. The clays are very micaceaus and there are mica flakes very thinly divided among the clays so they are unavoidable by the laser.

SECTION 2: CHI SQUARE ANALYSIS

2.1 Chi square analysis of temporal distribution of chemical group frequencies

A chi square analysis was conducted to test the hypothesis that there was no difference in the frequency of chemical groups in each time groups. The test result rejected the hypothesis (Chi Sq stat 98.4, DoF 14, p-value of 0.0000), providing support to the conjecture that the frequencies of chemical groups are significantly different across time periods.

Tables S11 A, S11 B and S11 C show the actual observations, the expected and the Chi Square statistic. Unassigned samples were not considered in the calculation, therefore only T2 (AD 100-450), T3 (AD 450-650) and T4 (AD 650-1000) were considered (Fig. S3).

2.2 Chi square analysis of distribution of chemical group frequencies across valleys

A chi square analysis was conducted to test the hypothesis that there is no difference in the frequencies of chemical groups in the different valleys and areas considered in this study. The test result rejected the hypothesis (Chi Sq stat 574.3, DoF 42, p-value of 0.0000), providing support to the conjecture that chemical group frequency varies across valleys/areas.

Tables S12 A, S12 B and S12 C show the actual observations, the expected and the Chi Square statistic. Unassigned specimens were not considered in the calculation; Calchaquí and Lerma were excluded given their extremely low sample sizes.

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FIGURES

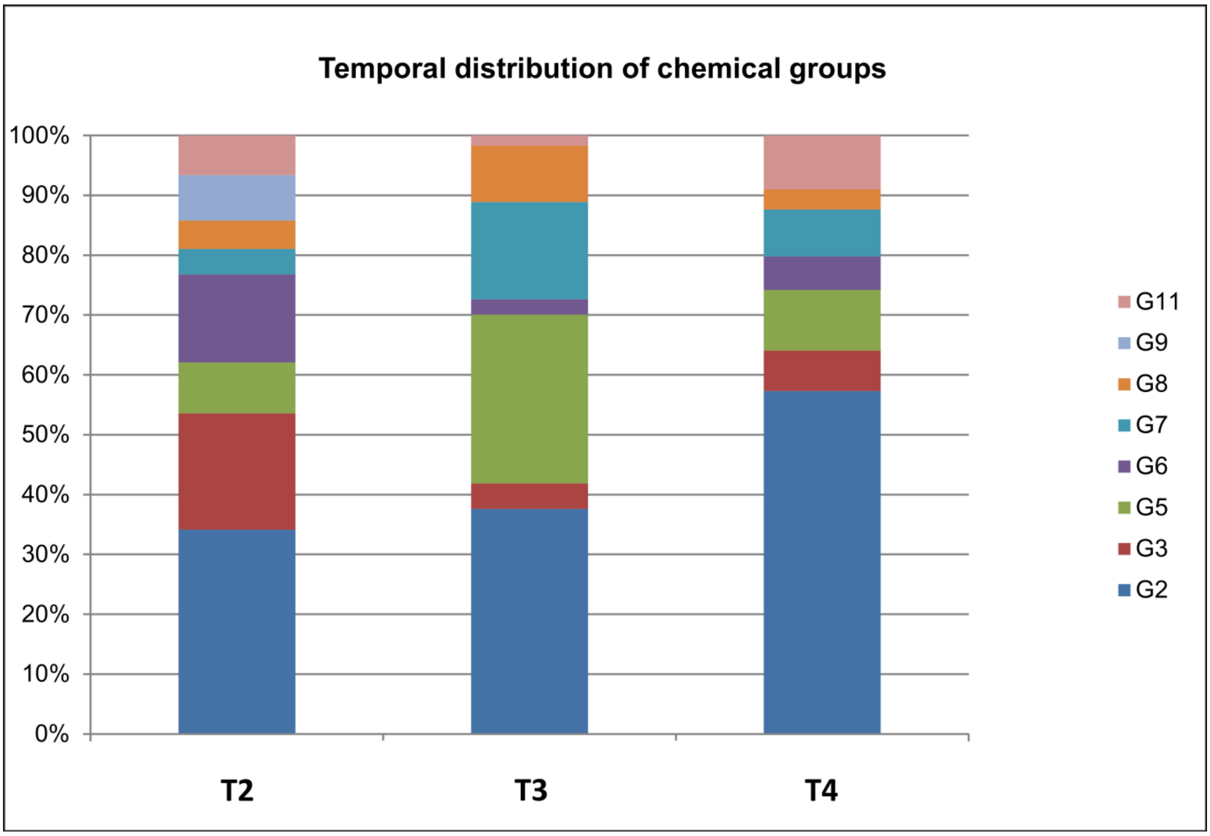

Figure S1 Temporal distribution of the pottery chemical macrogrups. Unassigned samples are not included, therefore T1 is not included in the graph.

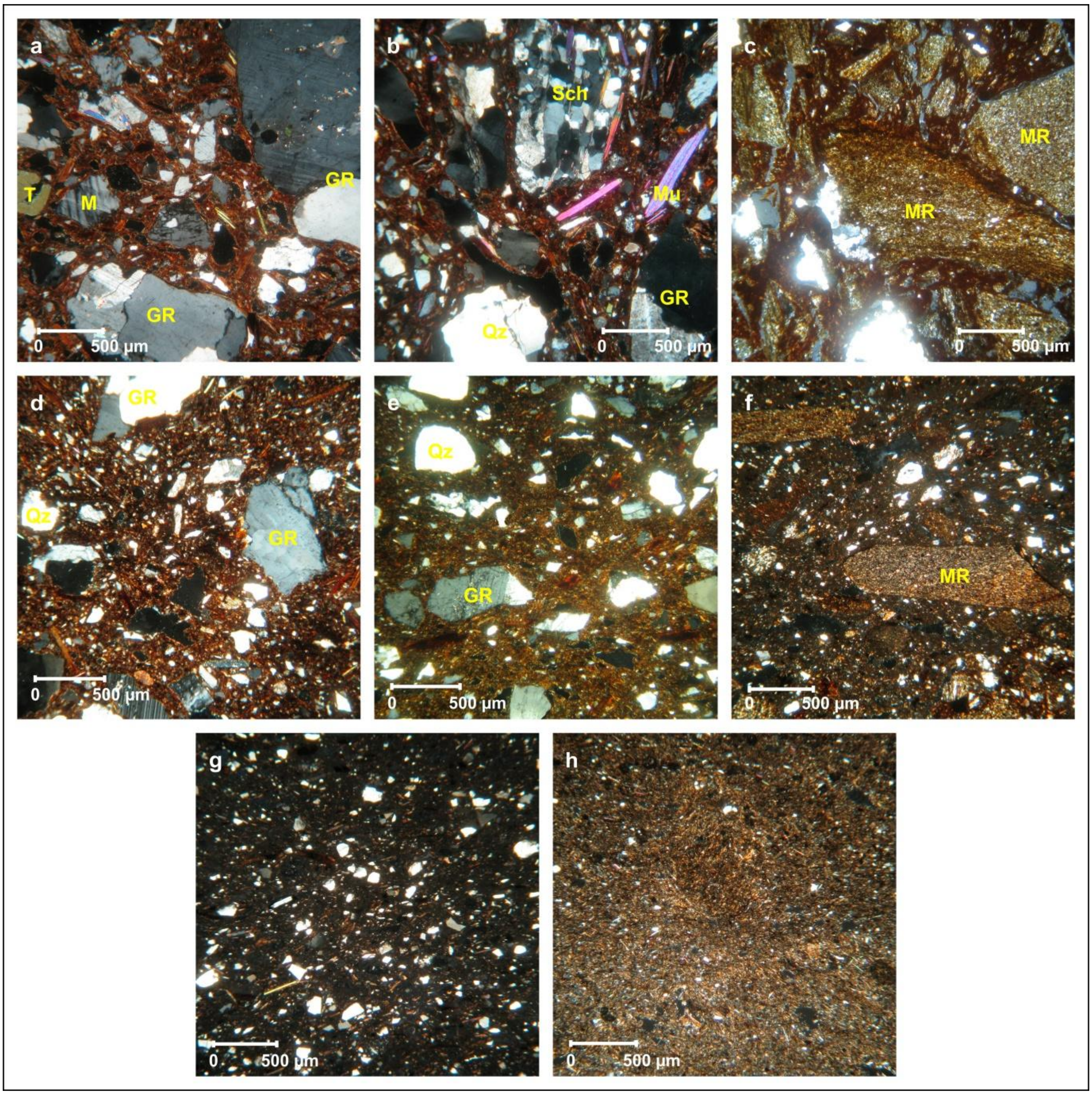

Figure S2 Petrographic thin sections of (a-c) coarse, (d-f) intermediate, and (g & h) fine fabrics. Qz: quartz, M: microcline, T: tourmaline, GR: granitic stone, MR: metamorphic rock, Sch: schist. Photomicrographs were taken with crossed polarized light and with magnification 50x.

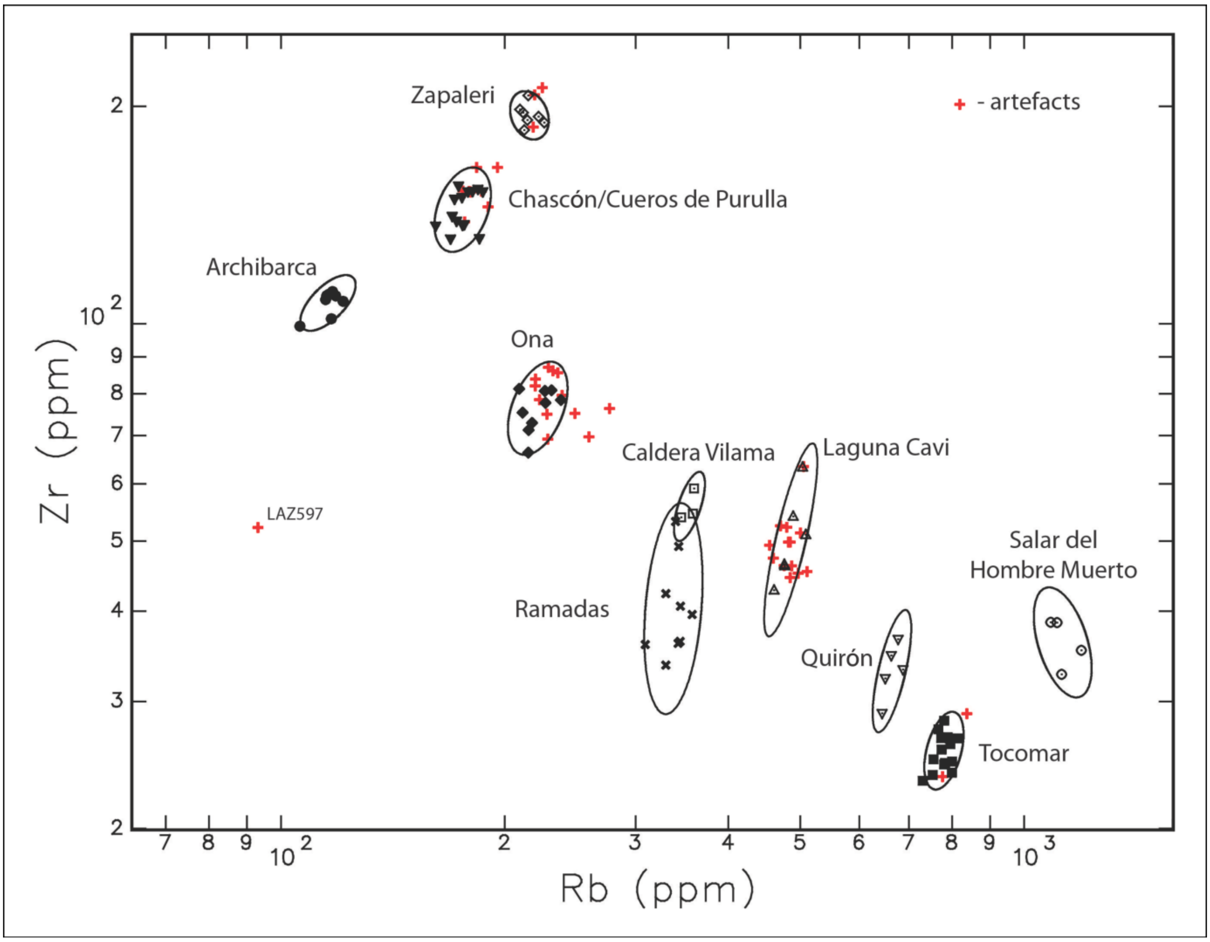

Figure S3 Bivariate plot of Rb vs Sr by XRF showing source groups for obsidian artefacts. Ellipses at approximately the 90% confidence level have been drawn around each chemical group.

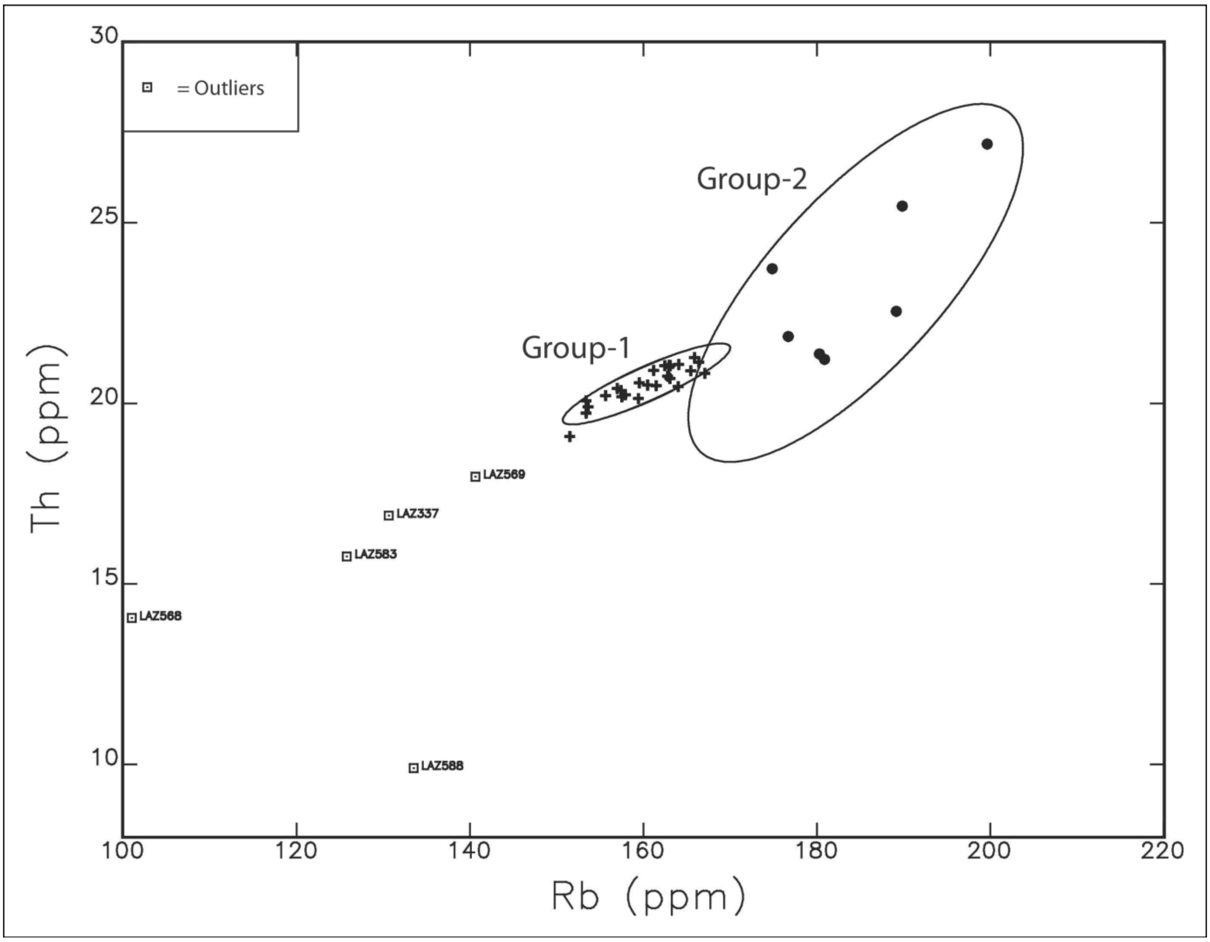

Figure S4 Bivariate plot of Fe versus Hf by NAA showing the subtypes for volcanic rock artefacts. Unknown sample LAZ347 is not shown on the plot. Ellipses at approximately the 90% confidence level have been drawn around each chemical group.

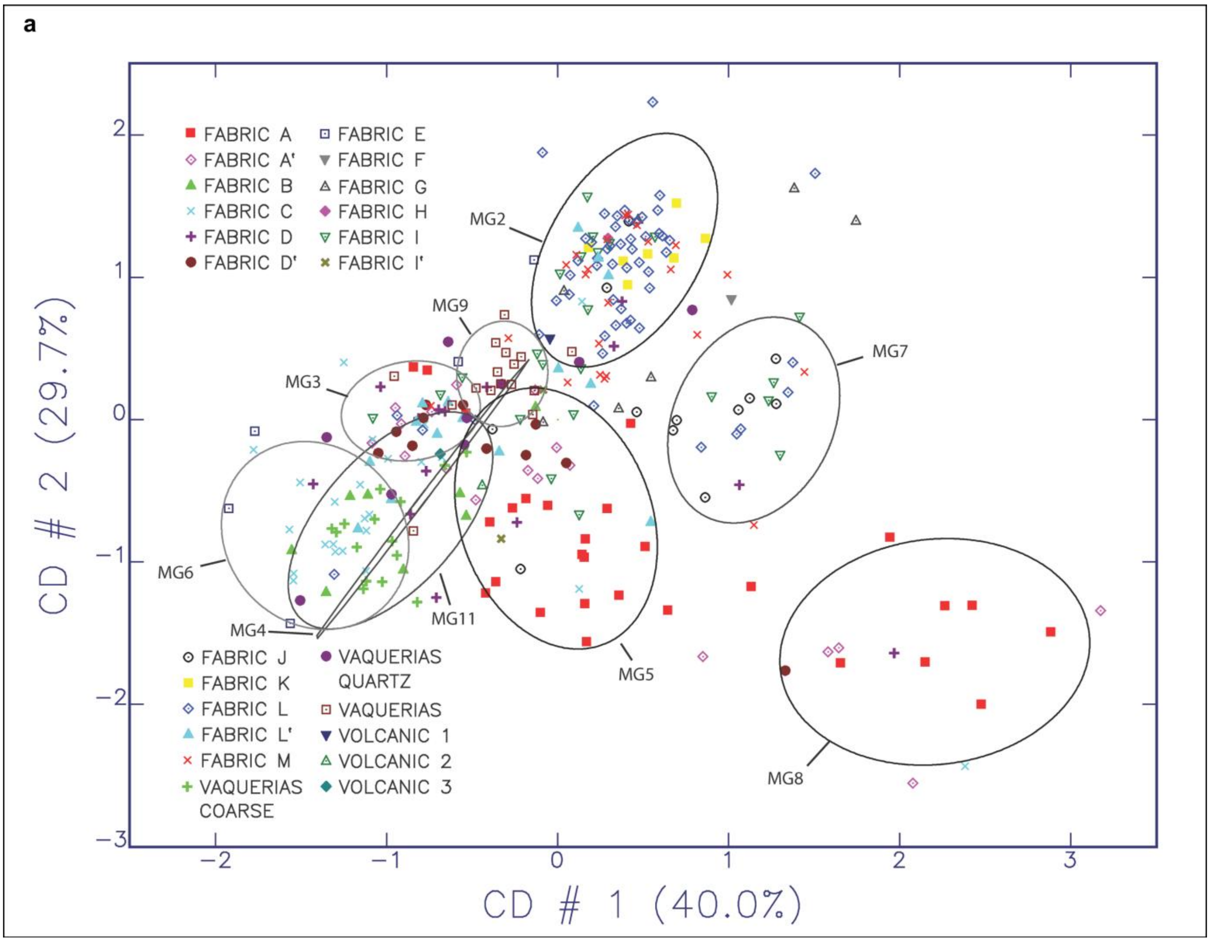

Figure S5 A Membership of petrographic samples groups within ceramic chemical macrogroups. Axes are Canonical Discriminant function #1 and #2. Ellipses represent 90% of confidence intervals of membership within macrogroups. Data points represent the chemical composition of individual samples.

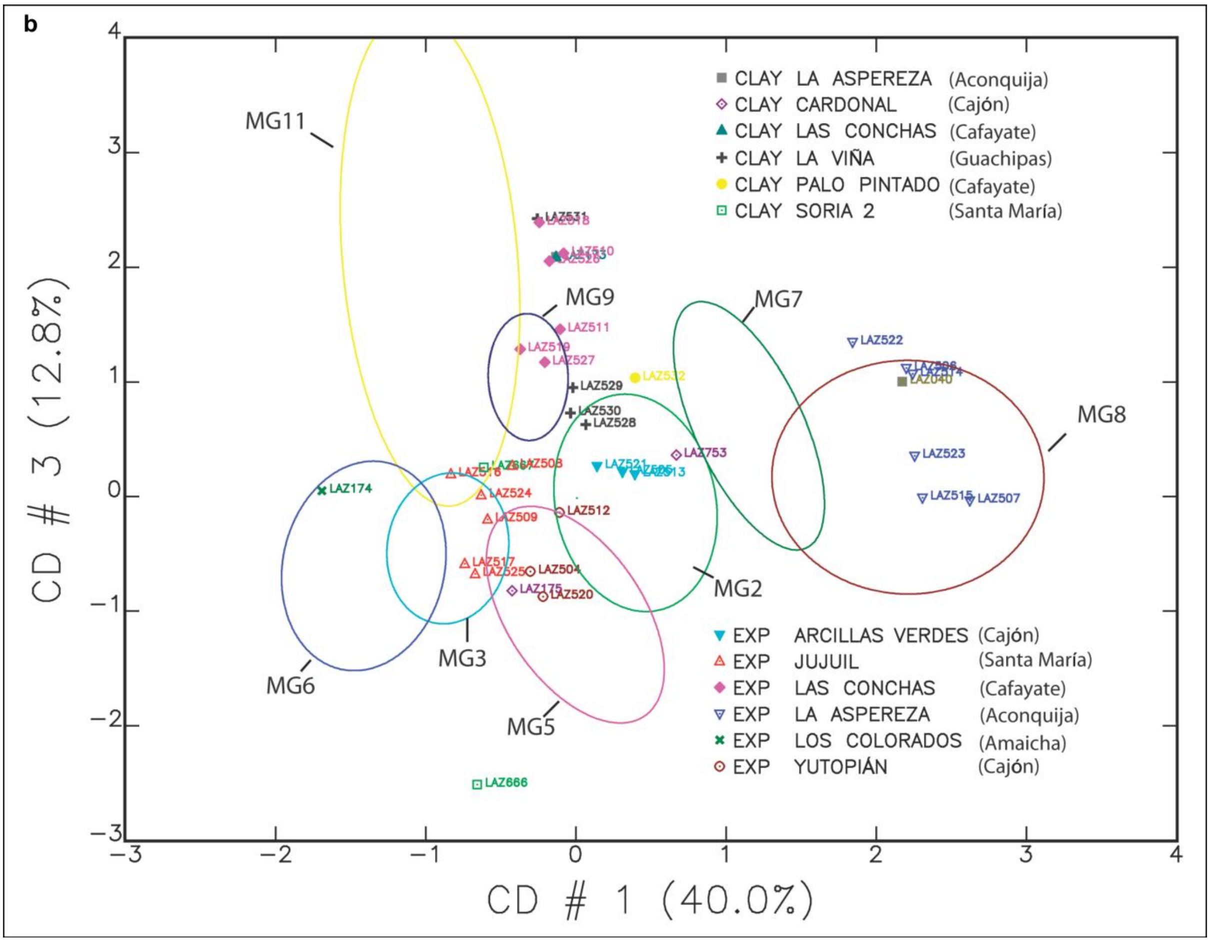

Figure S5 B Association of clay samples within ceramic chemical macrogroups. Axes are Canonical Discriminant function #1 and #3. Ellipses represent 90% of confidence intervals of membership within macrogroups. Data points represent the chemical composition of individual samples. Note: Clays from Las Conchas (LAZ173 and LAZ531) and La Viña (LAZ528 and LAZ529) are chemically close to G2, on CD1 and CD2 but CD3 removes them from MG2.

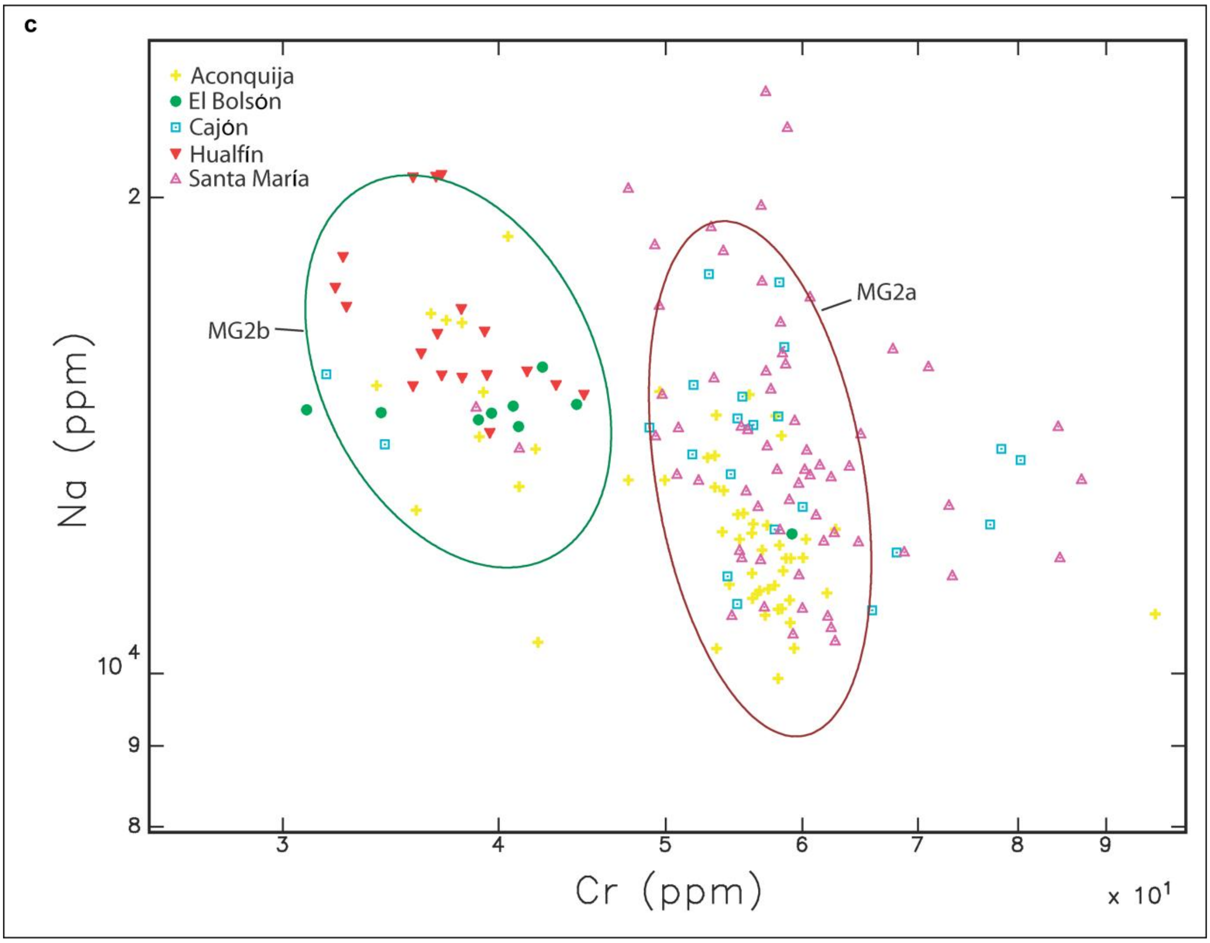

Figure S5 C Bivariate plot of NAA chemical data with axes showing Na versus Cr. This figure shows the chemical difference between subgroups MG2a and MG2b [LM1]. Ellipses represent 90% confidence intervals of membership within groups. Data points represent the chemical composition of individual samples.

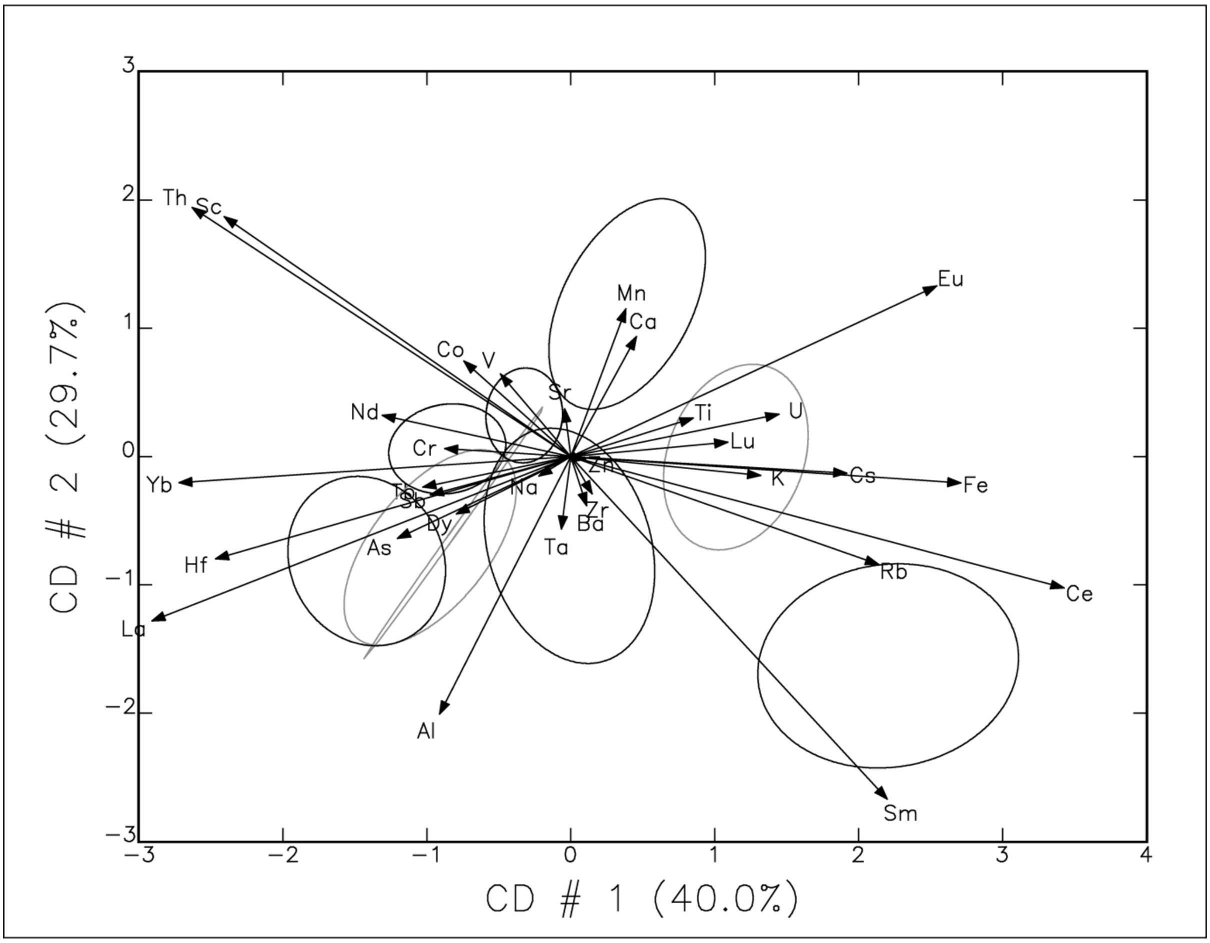

Figure S6 Canonical Discriminant factors 1 and 2 showing vectors for individual elements. The length and direction of the vector demonstrates the influence of each element on CDs 1 and 2. Ellipses represent 90% confidence intervals of membership within macrogroups. This figure should be used to interpret the influence of individual elements on the distribution of the data presented in Figure 3 of the main text.

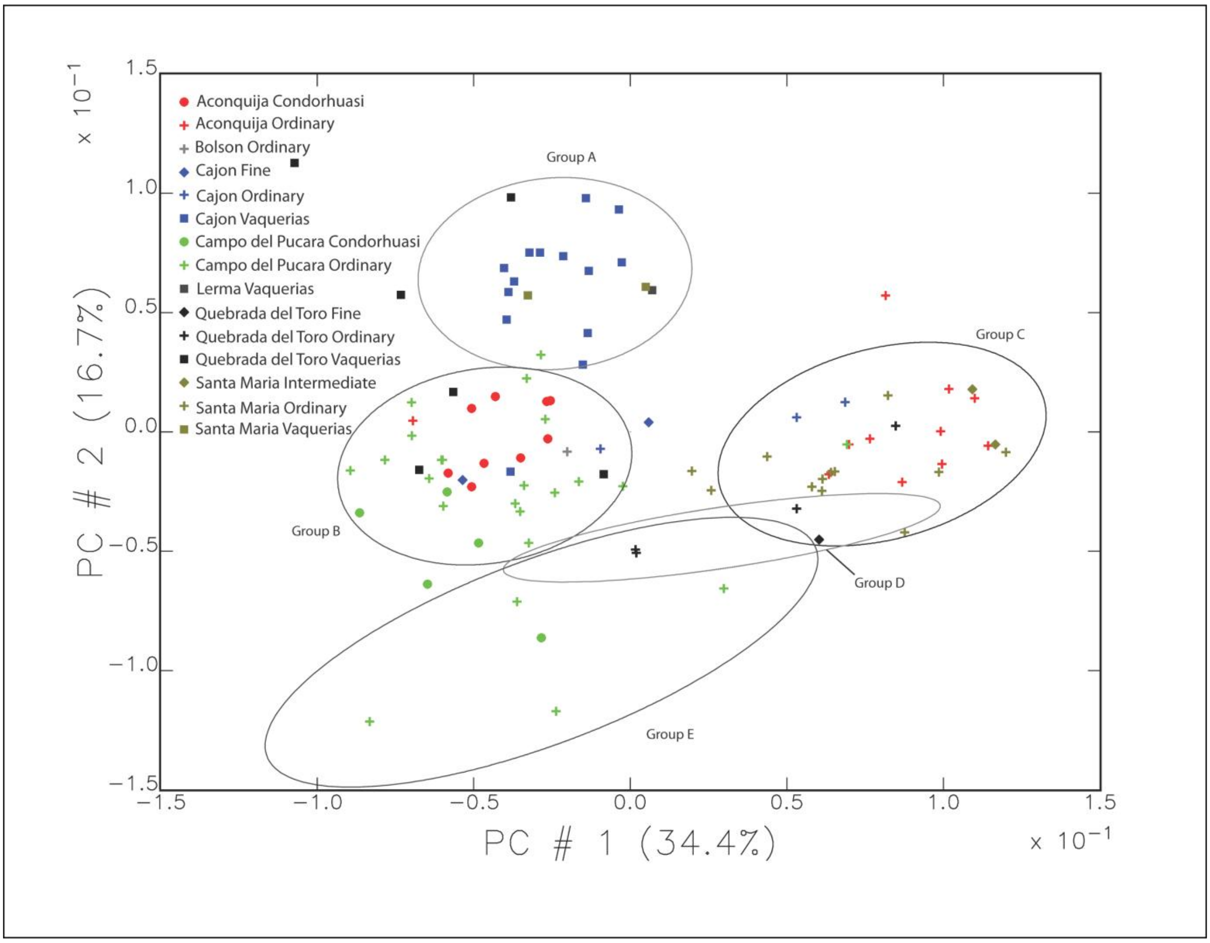

Figure S7 Scatterplot LA-ICP-MS data plotted on Principal Components 1 and 2. Ellipses represent 90 the percent confidence interval of group membership and data points represent the individual chemistry of the clay fractions of sherds in the sample. Symbol color is coded to the Valley where the sample was recovered and symbol shape denotes the pottery type.

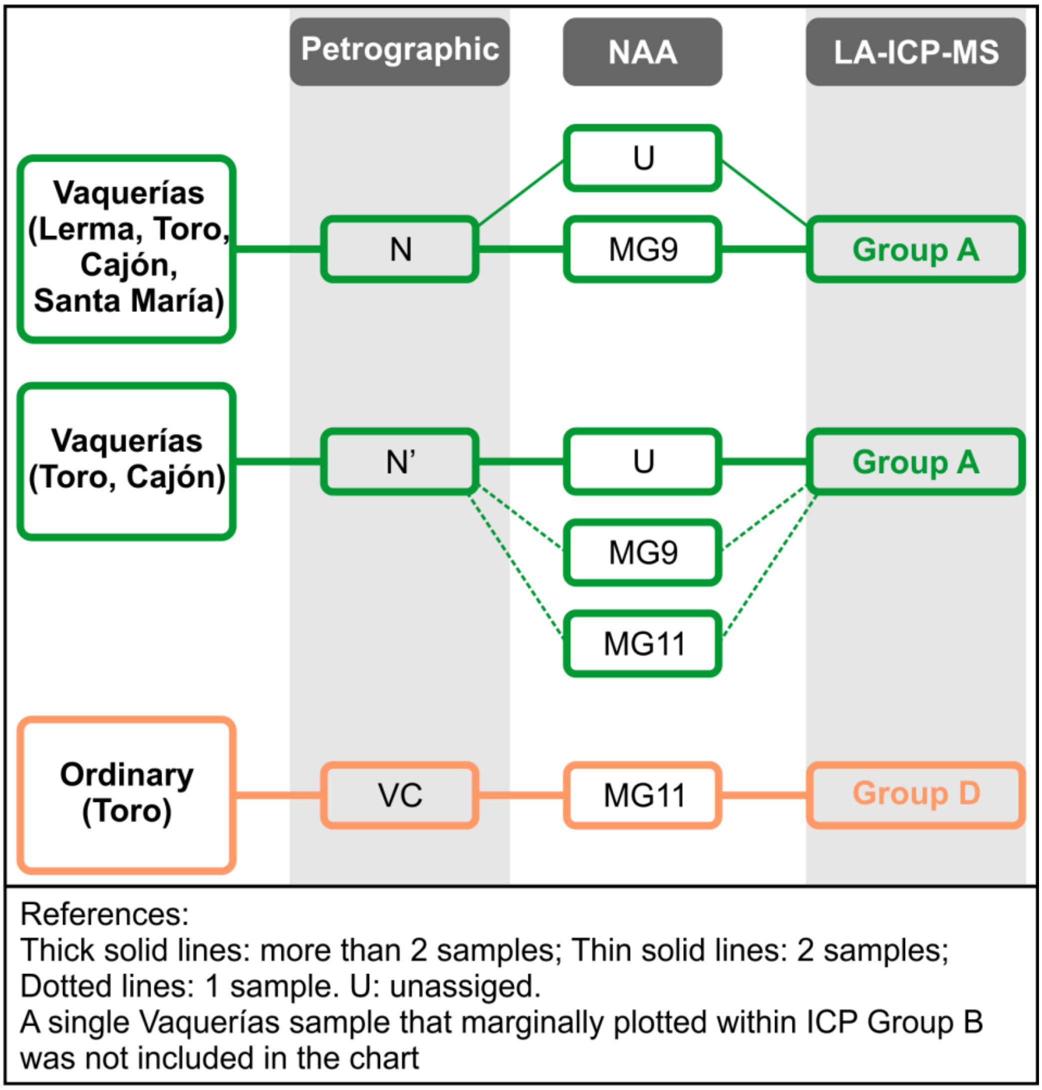

Figure S8 Flow chart describing the integration of analysis for Vaquerías pottery.

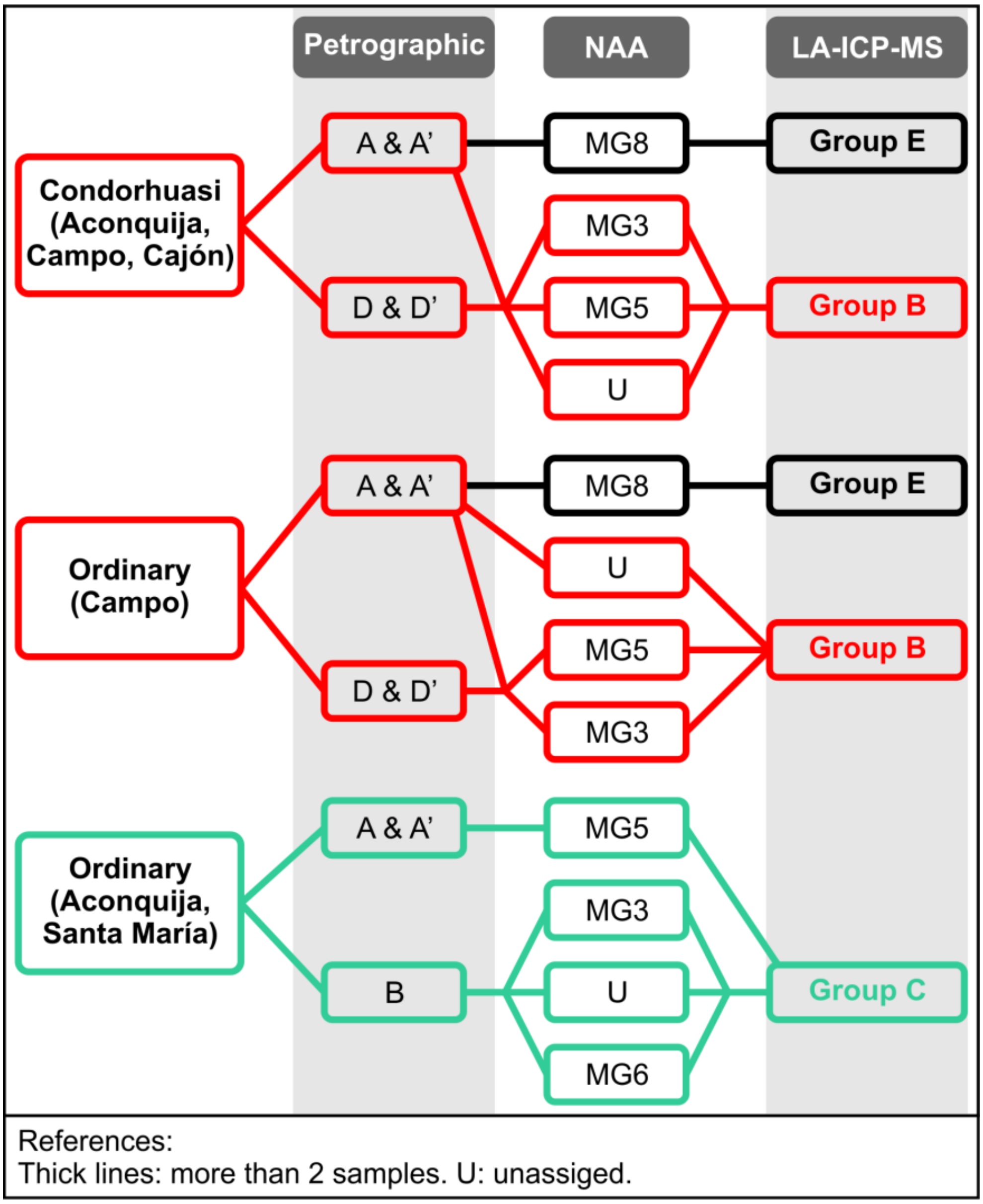

Figure S9 Flow chart describing the integration of analysis for Condorhuasi pottery.

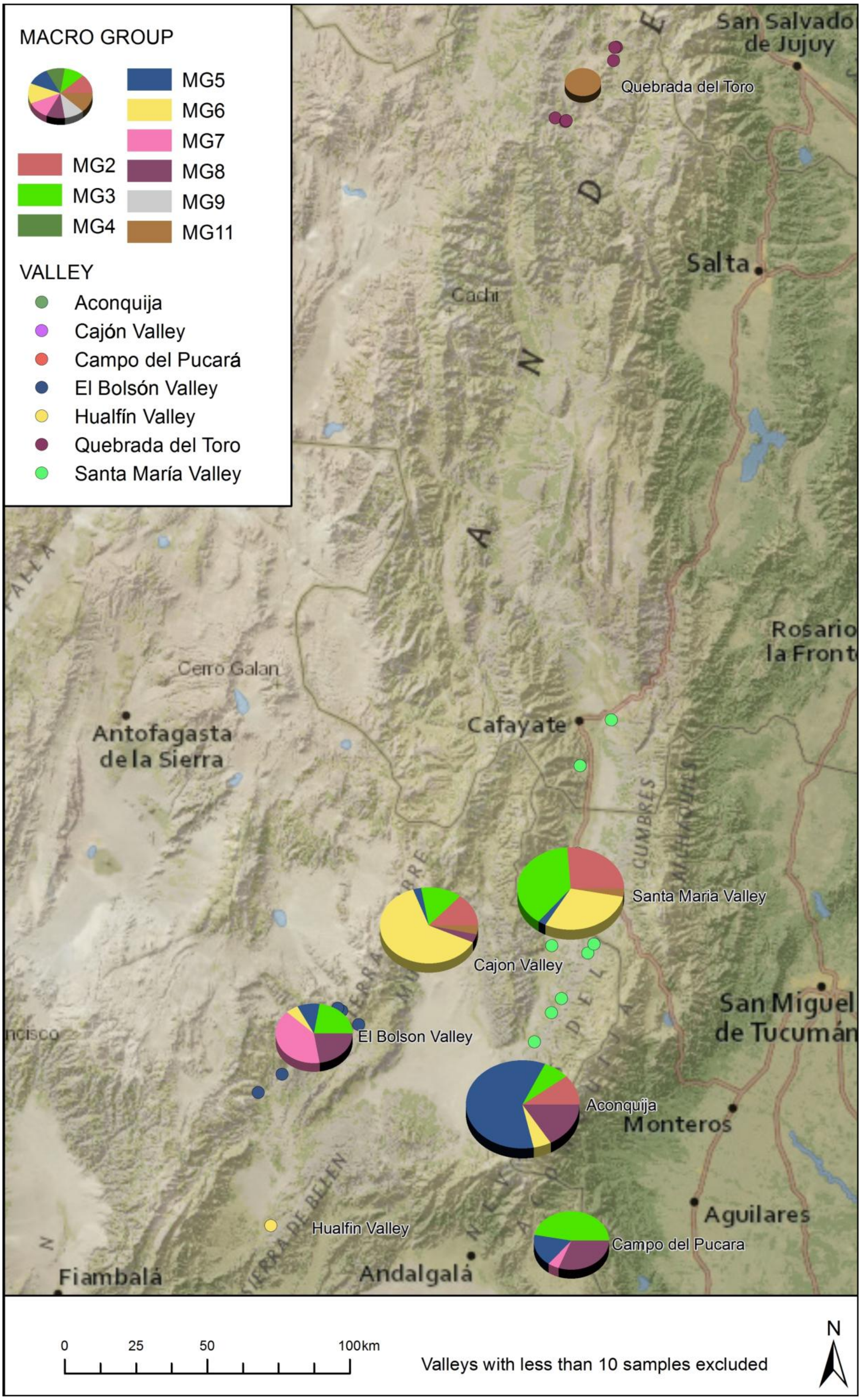

Figure S10 Pottery macrogroups frequencies for ordinary wares (coarse fabrics) across valleys and areas considered in the study.

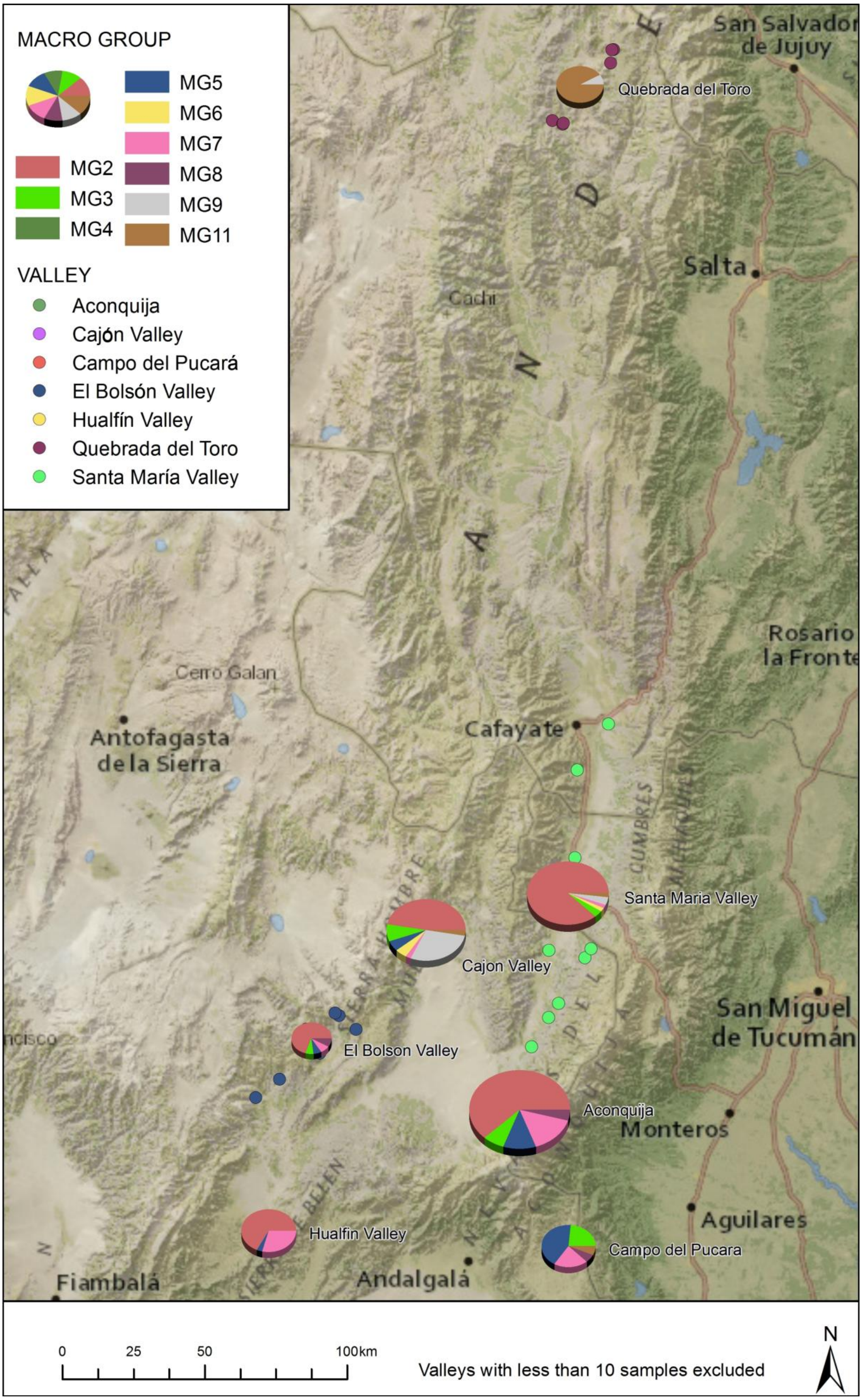

Figure S11 Pottery macrogroups frequencies for decorated wares (fine and intermediate fabrics) across valleys and areas considered in the study.

TABLES

Table S1 Total ceramic sample per area/valley and temporal group.

Time range	*Area*	*Site*	*Samples*
T-0: 400 BC-AD100	Toro	Las Cuevas I	2
T-1: AD 100-450	Aconquija	Antigal de Tesoro	31
		Ingenio Arenal-Faldas	22
	Cajón	Cardonal	71
		Yutopian	4
		Bordo Marcial	29
	Santa María	Soria 2	37
		Bañado viejo	21
		Tolombon	2
	Bolsón	El Médano	2
		Los Viscos	7
		Cueva Pintada	2
	Toro	Potrero Grande	1
		La Encrucijada II	1
		Las Cuevas 1	1
		Las Cuevas 5	7
	Campo	Alamito	39
	Lerma	Las Garzas	1
	Calchaquí	Campo colorado	1
T-2: AD 450-650	Aconquija	Loma Alta	50
		Ingenio Arenal-Faldas	24
	Santa María	Bañado Viejo	13
		Tolombon	2
		Masao	1
	Hualfin	La Ciénaga	18
	Bolsón	Alto Juan Pablo	3
		El Alto El Bolsón	8
		La Mesada	6
		Los Viscos	5
	Campo	Alamito	13
	Toro	Alero Tres Cruces I	3
T-3: 650-900	Aconquija	Tesoro 1	20
		Loma Alta	10
	Cajón	Yutopian	2
	Santa María	Morro de las Espinillas	14
		Bañado viejo	17
		Lampacito	3
		Ampajango	3
		Caspinchango	1
		Chimpa	1
		Tolombón	2

		Molino del Puesto	1
	Hualfín	La Ciénaga	12
	Bolsón	Barranco Dn Silvestre	4
		Morro Relincho	6
		Alto Juan Pablo	3
	Campo	Alamito	3
	Toro	Tres Cruces I	13
Total			542

Table S2 Obsidian samples and source assignations, including data from previous studies (Escola et al. 2007; Lazzari 1999, 2006; Lazzari et al. 2009; Yacobaccio et al. 2004).

Area	*Site*	*Ona*	*Cavi*	*Purulla*	*LB-Zap*	*A Tocomar*	*G-2*	*Atacacama*	*Total*
Aconquija	Tesoro 1	7	1				1		9
	Antigal Tesoro	7	1						8
	I. Arenal	10		1					11
	Loma Alta	29	2	3					34
Cajón	Cardonal	13	18	13					44
	Bordo Marcial	5	5	4					14
	Yutopián	2							2
Santa	Bañado Viejo	7							7
María	Potrero Bordón		1						1
Bolsón	Morro Relincho		2	1					3
	El Alto	4							4
	La Mesada	1							1
	Alto Juan Pablo			1					1
	El Médano	1	37	6					44
Toro	Cuevas 1	1			3	3			7
	Tres cruces							1	1
	Potrero Grande				2	1			3
Alisos	Santa Rosa	4							4
Lerma	Las Garzas				5				5
	Ampascachi	1							1
Laguna	Laguna Blanca	4	1						5
	Corral Blanco	1							1
Total		97	68	29	10	4	1	1	210

References: LB-Zap: Laguna Blanca Zapaleri; G-2 Unknown source G-2; A Tocomar: Alto Tocomar

Table S3 Volcanic rock source assignments.

Area	*Site*	*Type 1*	*Type 2*	*Outlier*	*Total*
Hualfín	La Ciénaga	1			1
Aconquija	Antigal de Tesoro	2			2
	Ingenio Arenal-Faldas	5	1		6
	Loma Alta	1			1
	Tesoro 1	5	1	1	7
Cajón	Bordo Marcial	6		1	7
	Casa Basalto, BM	3			3
	Casas coloradas	1			1
	Cardonal	2		3	5
Bolsón	Los Viscos		1		1
	La Mesada		1		1
	El Médano		2		2
Santa María	Soria			1	1
			1		1
Total		26	7	6	39

Table S4 Distribution of chemical macrogroups per valley/area.

	Aconquija	*Cajón*	*Sta María*	*Bolsón*	*Hualfín*	*Campo*	*Toro*	*Lerma*	*Calchaquí*	*Total*
MG2	54	23	63	9	18	0	0	0	0	167
MG3	10	8	16	5	0	13	0	0	0	52
MG5	42	3	1	3	1	10	0	0	0	60
MG6	3	22	13	1	0	0	0	0	0	39
MG7	12	1	1	8	8	5	0	0	0	35
MG8	11	1	0	5	0	7	0	0	0	24
MG9	0	12	2	0	0	0	1	1	0	16
MG11	0	2	2	0	0	1	18	0	1	24
Unass.	28	34	20	12	3	19	9	0	0	125
Total	160	106	118	43	30	55	28	1	1	542

Table S5 Decorated and ordinary wares per chemical macrogroup.

Macro-Group	*Decorated*	*Ordinary*	*Total*
MG2	158	9	167
%	94.7	5.3	
MG3	17	35	52
%	32.7	67.3	
MG5	21	39	60
%	35	65	
MG6	5	34	39
%	13	87	
MG7	27	8	35
%	77	23	
MG8	5	19	24
%	21	79	
MG9	16		16
%	100		
MG11	16	8	24
%	67	33	
Total	265	152	417

Table S6 ICP group assignments per area and ceramic type.

ICP Group	*Area*	*Vaquerías*	*Condorhuasi*	*Fine Ware*	*Intermediate fabric*	*Ordinary*	*Baño Blanco*	*Total*
A	Cajón	13						13
n=19	Lerma	1						1
	Toro	3						3
	Santa María	2						2
B	Aconquija		9			1		10
n=36	Cajón	1				1	1	3
	Campo		5			17		22
	Bolsón					1		1
C	Aconquija					10		10
n=26	Cajón					2		2
	Toro					1		1
	Santa María				2	11		13
D	Toro			1		3		4
n=4								0
E	Campo		1			4		5
n=4								0
Unass.	Cajón			1				1
n=6	Campo					1		1
	Toro	2		1				3
	Santa María					1		1
Total		22	15	3	2	53	1	96

Table S7 Uncertainty (in percentage) of values measured in ceramics by NAA. Estimates are based on a low calcium clay used to make pottery.

Element	Percent Uncertainty
As	2.5
La	1.5
Lu	4.0
Nd	8.0
Sm	1.5
U	8.0
Yb	3.0
Ce	1.0
Co	1.5
Cr	1.5
Cs	1.5
Eu	1.5
Fe	1.0
Hf	2.5
Ni	25.0
Rb	1.5
Sb	3.0
Sc	1.0
Sr	40.0
Ta	2.0
Tb	5.0
Th	1.0
Zn	5.0
Zr	10.0
Al	1.5
Ba	5.0
Ca	10.0
Dy	4.0
K	2.5
Mn	2.0
Na	1.5
Ti	5.0
V	2.5

Table S8 Estimated detection limits for ceramics analyzed by NAA

Element	Detection Limit
Na	100 ppm
Al	500 ppm
Cl	25 ppm
K	700 ppm
Sc	0.001 ppm
Mn	1 ppm
Fe	50 ppm
Co	0.02 ppm
Zn	1 ppm
Rb	1 ppm
Sr	40 ppm
Zr	25 ppm
Sb	0.02 ppm
Cs	0.02 ppm
Ba	10 ppm
La	0.5 ppm
Ce	0.1 ppm
Nd	1 ppm
Sm	0.02 ppm
Eu	0.005 ppm
Tb	0.05 ppm
Dy	0.5 ppm
Yb	0.1 ppm
Lu	0.1 ppm
Hf	0.01 ppm
Ta	0.03 ppm
Th	0.05 ppm
U	0.5 ppm

Table S9 Mean and coefficient of variation (CV) for every macrogroup. The final CV is calculated across groups.

	MG2***		MG3		MG4		MG5		MG6		MG7		MG8		MG9		MG11		Intergroup	
*	Mean	CV	Mean	CV	Mean	CV	Mean	CV	Mean	CV	Mean	CV	Mean	CV	Mean	CV	Mean	CV	CV	*
As**	5.87	32.0	9.95	21.7	62.62	27.0	11.48	39.7	17.75	28.3	8.64	31.4	9.85	34.1	9.10	15.6	27.02	69.2	34.9	As
La	36.64	11.3	39.96	13.5	49.85	32.9	40.27	13.6	54.20	15.1	38.40	14.6	25.43	26.4	45.91	7.7	43.27	18.8	17.0	La
Lu	0.44	11.1	0.48	18.9	0.36	1.0	0.49	23.9	0.63	20.3	0.45	13.5	0.37	28.5	0.47	8.0	0.49	13.5	15.7	Lu
Nd	33.91	14.8	36.86	15.6	35.07	21.9	39.79	14.5	51.81	17.5	34.83	14.2	24.38	24.8	41.63	9.3	39.60	22.6	16.9	Nd
Sm	7.26	10.2	8.00	15.1	6.41	12.7	8.79	14.6	11.43	16.0	7.79	13.9	5.54	22.0	9.02	9.2	8.21	25.2	15.3	Sm
U	4.89	22.9	3.25	17.6	5.44	11.6	5.42	80.5	3.25	20.7	6.10	21.6	7.66	48.1	3.68	13.5	3.29	13.5	31.0	U
Yb	2.92	11.7	3.49	19.5	1.91	5.4	3.36	23.1	4.81	21.6	2.80	11.9	1.89	22.6	3.28	8.2	3.42	15.0	16.1	Yb
Ce	78.85	12.3	83.37	11.6	90.52	33.4	81.24	14.8	95.51	13.3	86.93	17.9	45.60	34.5	91.97	8.4	89.74	21.6	17.8	Ce
Co	16.44	10.9	14.19	13.0	8.41	13.3	11.01	13.3	14.00	12.9	13.37	11.4	6.30	23.4	16.01	7.4	17.19	21.2	13.6	Co
Cr	53.84	21.2	54.76	14.3	32.56	11.0	40.41	19.1	52.95	14.0	38.15	18.7	24.57	40.0	63.93	6.5	69.83	21.5	17.2	Cr
Cs	16.10	21.4	10.70	16.9	35.03	54.5	21.72	39.1	12.93	14.8	26.70	20.6	78.14	26.3	12.40	8.5	20.08	49.4	30.7	Cs
Eu	1.35	7.1	1.46	13.0	1.08	2.8	1.41	16.9	2.03	19.9	1.29	10.7	0.83	21.5	1.69	8.9	1.52	25.9	14.4	Eu
Fe	45346.2	8.7	41447.8	8.0	34681.8	3.7	34063.4	10.6	40928.4	10.6	38638.2	10.5	24447.0	23.8	41973.5	6.8	46727.9	15.0	10.4	Fe
Hf	5.21	9.3	7.22	7.0	5.11	2.5	6.63	12.8	7.73	12.0	4.18	14.4	3.79	22.9	5.35	4.3	6.27	16.2	10.9	Hf
Rb	171.40	10.2	129.85	9.1	144.46	2.2	205.63	25.2	141.00	17.6	250.64	10.0	513.16	23.5	150.65	6.1	161.71	11.5	15.1	Rb
Sb**	0.57	30.2	0.61	18.7	1.27	6.0	0.52	26.7	0.74	25.3	0.57	20.6	1.03	62.8	1.38	8.1	2.01	57.4	31.3	Sb
Sc	16.15	9.7	14.04	9.7	13.31	7.0	11.56	12.0	14.73	11.1	13.49	9.5	10.16	14.4	14.95	6.8	16.09	16.9	10.7	Sc
Sr	255.23	22.7	210.41	29.6	345.18	3.9	168.16	37.0	176.38	42.4	134.48	51.3	82.44	53.6	266.96	17.4	114.84	59.9	28.5	Sr
Ta	1.62	11.0	1.26	13.0	1.39	2.1	1.92	33.8	1.34	13.3	2.41	25.4	8.13	67.3	1.28	4.2	1.27	10.3	36.2	Ta
Tb	0.93	14.6	1.03	16.5	0.71	18.6	1.11	17.1	1.61	18.2	1.01	15.8	0.69	23.7	1.11	11.6	1.01	32.9	18.5	Tb
Th	14.84	13.9	14.83	10.8	23.70	31.0	17.97	28.8	18.10	15.9	15.84	17.8	9.81	47.2	13.52	4.7	15.01	8.3	19.8	Th
Zn	114.91	13.8	96.23	18.2	81.22	4.1	82.68	17.3	88.11	17.0	105.82	18.8	99.84	20.9	100.63	8.2	113.25	17.9	15.3	Zn
Zr	139.85	16.3	183.79	13.3	119.53	3.6	182.76	23.7	203.12	12.4	119.91	20.5	101.62	32.5	145.42	10.8	154.41	17.0	16.3	Zr
Al	85896.1	5.6	86229.6	4.8	97354.2	3.3	83955.2	6.2	89509.1	6.5	85392.6	4.6	90039.4	8.6	87409.8	3.8	92717.4	8.9	5.8	Al
Ba	483.34	24.3	567.65	25.6	924.46	30.6	408.40	29.2	541.40	27.8	346.28	27.5	219.15	53.6	736.24	31.3	601.60	34.8	30.4	Ba
Ca	21762.7	28.4	12885.5	17.7	20748.0	10.2	12252.2	28.3	13099.8	27.3	16093.4	24.1	10246.2	66.4	26610.6	14.8	7634.6	48.1	25.4	Ca
Dy	4.91	14.7	5.76	16.8	3.05	7.4	5.88	19.2	8.49	17.9	5.17	14.7	3.40	23.1	5.72	7.8	5.71	22.2	16.3	Dy
K	30942.6	12.0	26432.3	12.8	23359.5	6.9	29859.5	14.0	26402.8	12.8	35128.5	10.7	32723.8	13.1	30746.2	6.9	33223.4	16.5	11.9	K
Mn	993.38	17.3	763.08	19.3	351.99	26.7	616.47	17.4	712.13	15.6	807.41	25.4	797.93	57.2	867.30	8.2	875.7	31.6	24.2	Mn
Na	13985.1	18.1	13839.3	11.1	18569.7	24.7	15400.4	21.4	11977.2	12.0	14962.5	11.7	16494.2	25.1	9528.8	14.5	10793.2	18.9	18.1	Na
Ti	4841.15	17.3	5069.11	14.3	3427.9	12.3	4088.7	18.6	4608.7	15.4	4116.1	19.4	2604.5	52.0	4848.4	13.0	5055.5	12.9	17.8	Ti
V	103.52	16.6	99.47	10.2	105.92	10.0	83.24	23.1	101.75	12.5	83.86	13.8	47.43	45.8	99.25	9.3	112.91	14.2	15.4	V

References

* Ni not shown because it is below detection limits

** As and Sb are highly variable which may pertain to contamination due to metals mining

*** MG2 is not split into its subgroups here because the only variable of significance between MG2a and MG2b is Cr.

Table S10 Discriminant factor loadings for the first 4 canonical discriminant factors (CDs). High numbers mean those elements more greatly affect the value on that factor. High positive loadings mean that the elemental composition and the CD value are positively correlated. High negative values meant that the elemental composition and the CD value are inversely related. The top three positive and negative elements for each discriminant factor are highlighted in **bold**. The next three most influential elements are highlighted in *italics*.

			CD1	CD2	CD3	CD4
Element	Magnitude	% variance -->	40.02	29.74	12.85	5.23
Sm	2.65		*0.76*	**-1.07**	**-0.63**	**1.87**
Ce	2.52		**1.18**	*-0.41*	0.55	**0.75**
La	2.15		**-1.01**	**-0.51**	**0.85**	**-1.04**
Sc	1.93		*-0.83*	**0.75**	-0.24	**-1.13**
Th	1.75		*-0.91*	**0.78**	-0.27	**-0.89**
Fe	1.68		**0.94**	-0.08	**0.68**	**0.86**
Eu	1.38		**0.88**	**0.53**	-0.24	*-0.51*
Al	1.20		-0.32	**-0.81**	0.20	*0.27*
Hf	1.16		*-0.85*	*-0.32*	-0.43	0.18
Yb	1.00		**-0.94**	-0.08	-0.08	0.10
Cr	0.96		-0.30	0.02	-0.06	0.14
Rb	0.89		*0.74*	*-0.34*	0.03	0.18
Nd	0.78		-0.45	0.13	-0.12	*-0.31*
Cs	0.77		*0.66*	-0.05	0.05	-0.23
Co	0.76		-0.26	*0.30*	0.16	*0.28*
Sb	0.62		-0.34	-0.12	0.32	*0.34*
As	0.57		-0.42	-0.26	0.10	-0.20
U	0.56		0.50	0.13	-0.01	-0.10
K	0.55		0.46	-0.06	0.13	0.21
V	0.55		-0.17	*0.26*	-0.19	-0.21
Mn	0.54		0.13	*0.46*	0.03	-0.15
Dy	0.52		-0.27	-0.18	-0.10	0.20
Ta	0.51		-0.02	-0.23	-0.15	0.25
Tb	0.49		-0.35	-0.10	0.02	-0.11
Ca	0.47		0.16	0.37	-0.07	0.10
Ti	0.44		0.29	0.12	-0.07	-0.13
Zn	0.44		0.04	-0.01	0.07	-0.17
Lu	0.44		0.38	0.05	-0.04	-0.09
Na	0.35		-0.08	-0.06	-0.02	*-0.25*
Sr	0.35		-0.01	0.15	-0.11	0.12
Zr	0.29		0.05	-0.12	-0.19	-0.06
Ba	0.20		0.04	-0.15	0.09	0.00

Table S11 Chi Square test: Temporal distribution of pottery chemical macrogroups. (a) actual (b) expected (c) Chi square statistics.

Table S11 A

Actual	*T2*	*T3*	*T4*	*Total*
G2	72	44	51	167
G3	41	5	6	52
G5	18	33	9	60
G6	31	3	5	39
G7	9	19	7	35
G8	10	11	3	24
G9	16	0	0	16
G11	13	2	8	24
Total	211	117	89	417

Table S11 B

Expected	*T2*	*T3*	*T4*	*Total*
G2	85	47	36	167
G3	26	15	11	52
G5	30	17	13	60
G6	20	11	8	39
G7	18	10	7	35
G8	12	7	5	24
G9	8	4	3	16
G11	12	6	5	24
Total	211	117	89	417

Table S11 C

Chi Sq	*T2*	*T3*	*T4*	*Total*
G2	1.8	0.2	6.6	8.6
G3	8.2	6.3	2.3	16.8
G5	5.0	15.5	1.1	21.7
G6	6.4	5.8	1.3	13.5
G7	4.3	8.6	0.0	12.9
G8	0.4	2.7	0.9	4.0
G9	7.7	4.5	3.4	15.6
G11	0.3	3.3	1.6	5.2
Total	34.2	46.9	17.4	98.4

Table S12 Chi square: Spatial distribution of pottery chemical macrogroups.
a) Actual, (b) Expected, (c) Chi square statistic.

Table S12 A

Actual	*Aconquija*	*Cajón*	*Santa María*	*Bolsón*	*Hualfín*	*Campo*	*Toro*	*Total*
MG2	54	23	63	9	18	0	0	167
MG3	10	8	16	5	0	13	0	52
MG5	42	3	1	3	1	10	0	60
MG6	3	22	13	1	0	0	0	39
MG7	12	1	1	8	8	5	0	35
MG8	11	1	0	5	0	7	0	24
MG9	0	12	2	0	0	0	1	15
MG11	0	2	2	0	0	1	18	23
Total	132	72	98	31	27	36	19	415

Table S12 B

Expected	*Aconquija*	*Cajón*	*Santa María*	*Bolsón*	*Hualfín*	*Campo*	*Toro*	*Total*
MG2	53.1	29.0	39.4	12.5	10.9	14.5	7.6	167.0
MG3	16.5	9.0	12.3	3.9	3.4	4.5	2.4	52.0
MG5	19.1	10.4	14.2	4.5	3.9	5.2	2.7	60.0
MG6	12.4	6.8	9.2	2.9	2.5	3.4	1.8	39.0
MG7	11.1	6.1	8.3	2.6	2.3	3.0	1.6	35.0
MG8	7.6	4.2	5.7	1.8	1.6	2.1	1.1	24.0
MG9	4.8	2.6	3.5	1.1	1.0	1.3	0.7	15.0
MG11	7.3	4.0	5.4	1.7	1.5	2.0	1.1	23.0
Total	132.0	72.0	98.0	31.0	27.0	36.0	19.0	415.0

Table S12 C

Chi sq	*Aconquija*	*Cajón*	*Santa María*	*Bolsón*	*Hualfín*	*Campo*	*Toro*	*Total*
MG2	0.0	1.2	14.1	1.0	4.7	14.5	7.6	43.1
MG3	2.6	0.1	1.1	0.3	3.4	16.0	2.4	25.9
MG5	27.5	5.3	12.2	0.5	2.2	4.4	2.7	54.8
MG6	7.1	34.3	1.6	1.3	2.5	3.4	1.8	52.0
MG7	0.1	4.2	6.4	11.1	14.4	1.3	1.6	39.0
MG8	1.5	2.4	5.7	5.7	1.6	11.6	1.1	29.6
MG9	4.8	33.9	0.7	1.1	1.0	1.3	0.1	42.9
MG11	7.3	1.0	2.2	1.7	1.5	0.5	272.7	286.9
Total	50.9	82.5	43.9	22.7	31.2	52.9	290.1	574.3

COVER PAGE

Article: Compositional data supports decentralized model of production and circulation of artifacts in the pre-Columbian south-central Andes

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PETROGRAPHY THIN SECTON POINT COUTING DATASET.
Data obtained by L Pereyra Domingorena.

For the present study of NWA ceramics, point counting considered a minimum of 300 points per thin section, through the *multiple interception method*. Counting was done manually, with a graded scale added as accessory to the gyratory tray of the microscope. This stage also included the recording of the shapes and sizes of the aplastic inclusions and voids, considering their longest axis, using the micrometric scale of the microscope lens. The comparative analysis of the records of ceramic fabrics, together with the implementation of *cluster analysis,* enabled the generation of a typology based on both qualitative (i.e. structures in matrix, size and shape of inclusions and voids) and quantitative (matrix percentage, voids and aplastics) criteria. For results and interpretation of the analysis, plus additional details of themethodology, please refer to the Appendix of the PNAS Article.

Corte N°	Procedencia	Tipo	Matriz	Cavid.	Qz	Fk	Plag	Micrcl.	Biot.	Musc.
C242-HE1	Cardonal E1	Rec. A. La manga?	69.00%	4.68%	10.33%	4.00%	1.33%	0.00%	3.33%	0.33%
C246-23	Cardonal E1	Ollita pulida	94.00%	2.06%	2.75%	0.34%	0.17%	0.00%	0.17%	0.17%
C253-3	Cardonal E1	Cántaro rojo	72.31%	4.57%	6.72%	2.15%	0.27%	2.69%	1.34%	0.54%
C230-7	Cardonal E1	Olla/cántaro pulido	82.89%	3.13%	6.51%	0.73%	0.61%	0.00%	0.96%	0.36%
C497-x	Cardonal E1	Pipa	78.09%	7.91%	7.34%	0.55%	0.55%	0.00%	0.55%	0.55%
C245-3	Cardonal E1		77.50%	5.14%	10.78%	0.49%	0.24%	0.00%	1.22%	1.71%
C237-4	Cardonal E1		74.11%	1.58%	10.75%	1.26%	0.00%	0.31%	1.89%	1.58%
C246-14	Cardonal E1	Cuenco gris pulido con aplique	82.72%	2.55%	7.95%	0.56%	0.00%	0.00%	1.70%	0.85%
C495-12	Cardonal E1	Vaso-Jarro gris pulido	69.07%	3.74%	10.60%	0.62%	1.03%	0.00%	1.87%	0.62%
C495-40	Cardonal E1	Olla ordinario (C495-40)	58.87%	6.55%	15.54%	1.87%	1.87%	0.56%	2.62%	1.49%
C10-T70	Cardonal E2	Cántaro fino	70.54%	3.64%	3.97%	1.00%	0.33%	0.00%	0.66%	0.33%
C46-T6	Cardonal E2	olla tosca delgada!	70.79%	4.69%	12.62%	0.23%	0.23%	0.00%	3.27%	2.80%
C65-T32	Cardonal E2	Cántaro S/comp.	58.00%	7.00%	7.00%	2.67%	0.67%	0.00%	1.00%	0.67%
C44-T35	Cardonal E2	Cántaro menos completo.	57.69%	7.33%	3.33%	3.00%	0.33%	0.33%	1.00%	0.33%
C70-T10	Cardonal E2	Cuenco	92.00%	4.67%	0.67%	0.67%	0.33%	0.00%	0.33%	0.33%
C70-T4	Cardonal E2	V. Zoomorfa Quirquincho	87.67%	4.00%	4.00%	0.67%	0.33%	0.00%	0.33%	0.33%
C54-T21	Cardonal E2	Jarrita dorsoventral ante pulido	93.00%	3.34%	1.67%	0.33%	0.33%	0.00%	0.00%	0.00%
Laz215	Cardonal E2	Jarra Gris Pulida Incisa (C35-T18)	79.41%	5.42%	9.68%	0.19%	0.58%	0.00%	0.58%	0.38%
Laz210	Cardonal E2	Ord delg pint roja (C70-3)	64.18%	8.89%	8.89%	0.36%	0.84%	0.00%	0.60%	1.08%
Laz211	Cardonal E2	Borde evertido ord (C12-28)	51.15%	9.03%	17.12%	2.14%	2.14%	1.66%	5.35%	1.42%
Laz213	Cardonal E2	Ordinario baño rojo (C27-T23)	57.06%	8.49%	18.33%	1.34%	1.21%	0.40%	0.80%	0.40%
Laz212	Cardonal E2	Borde ord labio recto (C70-T7)	52.18%	7.87%	19.43%	2.09%	1.84%	0.49%	2.83%	1.72%
Laz214	Cardonal E2	Olla ord delgada (C53-T30)	58.03%	6.31%	21.84%	0.73%	0.24%	0.73%	0.73%	0.73%
C128-T12	Cardonal E3	Modelado antropomorfo	66.77%	4.51%	5.48%	1.29%	0.64%	0.00%	0.00%	5.16%
C139-T21	Cardonal E3	Olla Tosca boca lateral	55.67%	6.00%	10.33%	4.00%	1.00%	0.00%	3.67%	1.00%
Laz219	Cardonal E3	Jarro Gris Pulido (C104-1)	70.91%	6.50%	9.88%	5.78%	0.48%	0.00%	0.10%	0.00%

Laz217	Cardonal E3	Cuenco borde egrosado (C86-T8)	53.41%	6.40%	25.73%	1.24%	1.75%	0.31%	1.97%	0.82%
Laz216	Cardonal E3	Olla ordinaria (C145-T8)	54.16%	6.61%	19.51%	1.43%	1.32%	0.11%	3.64%	1.65%
Laz218	Cardonal E3	O ord cuello lev evertido (C108-12)	51.96%	7.82%	15.31%	1.30%	1.63%	1.30%	4.88%	3.91%
Laz245	Cardonal E3	Tosco Rojo Liso (C113-12)	54.69%	7.32%	17.80%	1.26%	1.14%	1.14%	3.03%	2.77%
Laz220	Cardonal E3	Cántaro Ordinario (C82-1)	51.16%	8.07%	5.22%	0.15%	0.15%	0.00%	0.15%	0.00%
Laz242	Cardonal E5	Frag. Río Diablo (C322-T8)	76.72%	1.04%	11.76%	2.42%	0.35%	0.00%	1.73%	0.00%
Laz222	Cardonal E5	Ollita ante pulida (C396-T1)	85.89%	2.95%	6.04%	0.29%	0.29%	0.00%	0.88%	0.14%
Laz244	Cardonal E5	Frag. Fino Rojo Liso (C419-1)	66.22%	6.15%	15.82%	0.66%	1.75%	0.00%	1.31%	1.09%
Laz226	Cardonal E5	Cuenco gris pulido (C340-T23)	80.08%	5.67%	8.44%	0.79%	0.53%	0.00%	0.67%	0.39%
Laz223	Cardonal E5	Jarrito ante pul inc (C399-T1)	59.85%	4.70%	27.25%	1.17%	0.44%	0.00%	0.44%	0.14%
Laz227	Cardonal E5	Jarrita gris pulida (C431-T3)	84.55%	2.36%	5.71%	0.30%	0.98%	0.19%	2.36%	0.10%
Laz230	Cardonal E5	Jarra Ante Roj lab recto (C416-4)	65.93%	6.18%	13.70%	0.58%	0.19%	0.00%	0.96%	0.77%
Laz239	Cardonal E5	Cuenco ornitomorfo (C281-T6)	72.98%	2.36%	11.32%	1.01%	1.01%	0.00%	3.36%	0.34%
Laz236	Cardonal E5	Jarrito gris pulido (C400-T2)	57.97%	6.92%	22.63%	1.33%	1.20%	0.53%	2.40%	0.13%
Laz231	Cardonal E5	Olla cuello marcada (C380-T3)	55.98%	7.62%	18.60%	1.94%	2.71%	1.03%	3.75%	1.81%
Laz237	Cardonal E5	Cuenco gris bruñido (C368-2)	49.37%	4.20%	33.06%	3.11%	0.93%	0.31%	1.24%	1.24%
Laz232	Cardonal E5	Olla cuello leve evert (C388-T8)	57.48%	6.95%	22.91%	1.78%	1.22%	0.94%	1.03%	0.94%
Laz238	Cardonal E5	Olla tosca (C330-15)	52.28%	6.95%	20.41%	2.42%	1.01%	0.51%	4.53%	1.31%
Laz241	Cardonal E5	Vasija antropomorfa (C321-T4)	46.00%	6.51%	15.96%	0.16%	0.00%	0.16%	2.28%	2.28%
Laz233	Cardonal E5	Olla ordinaria (C400-T3)	50.18%	7.90%	17.93%	2.53%	0.51%	0.30%	7.70%	1.62%
C1221-T10	Cardonal E5	Jarra ordinaria (C1221-T10b)	53.17%	5.57%	14.56%	2.51%	1.25%	0.35%	4.49%	1.61%
C313-1	Cardonal E5	Jarrita Gris pulida (C313-1)	80.62%	3.89%	6.28%	0.29%	0.59%	0.00%	2.09%	1.49%
Laz228	Cardonal E5	Olla tosca (C386-T6)	45.55%	8.88%	17.37%	0.20%	1.41%	0.40%	4.80%	2.62%
C426-1	Cardonal E5	Cuenco CU4 (C426-1)	56.90%	4.64%	18.30%	1.36%	1.36%	0.54%	4.64%	1.36%
Laz221	Cardonal E4	Jarro Ante Pulido (C193-T1)	75.67%	2.99%	7.69%	0.99%	0.25%	0.50%	0.74%	0.25%
C191-T2	Cardonal E4	Jarrita Gris Pulida	64.62%	2.85%	8.57%	0.23%	0.47%	0.00%	0.47%	0.23%
C562-4	Cardonal Est. A	Ollita calceiforme Laz201	53.09%	4.12%	9.38%	0.92%	0.00%	0.00%	0.22%	1.15%

Laz083	Cardonal Rec. Sup	Vaquerías	77.37%	3.21%	5.14%	0.16%	0.32%	0.16%	0.00%	0.16%
V5	Cardonal Rec. Sup	Vaquerías (C75-38)	74.07%	2.34%	7.87%	0.21%	0.42%	0.00%	0.21%	0.21%
V32	Cardonal E5	Vaquerías (C260-3)	75.11%	3.56%	7.12%	1.48%	1.78%	0.00%	0.59%	0.29%
V33	Cardonal E1	Vaquerías (C241-104)	75.88%	3.56%	10.27%	1.18%	0.40%	0.00%	0.40%	0.40%
V28	Cardonal E1	Vaquerías (C255-H1)	78.19%	2.10%	5.52%	0.26%	0.26%	0.00%	0.26%	0.26%
V29	Cardonal E5	Vaquerías (C271-T1)	71.07%	3.53%	12.38%	0.22%	0.22%	0.00%	0.44%	0.22%
V31	sin datos	Vaquerías (sin númeración)	76.56%	2.99%	7.12%	0.23%	0.23%	0.00%	0.23%	0.23%
V34	Cardonal E1	Vaquerías (C242-11)	74.39%	4.07%	7.12%	1.01%	0.40%	0.20%	1.22%	0.20%
V35	Cardonal Rec. Sup	Vaquerías (C259-38)	79.12%	3.61%	5.67%	0.26%	0.26%	0.00%	0.26%	0.26%
V38	Cardonal Rec. Sup	Vaquerías (C259-7)	78.11%	1.59%	7.12%	1.27%	0.50%	0.00%	0.50%	0.50%
V14	Cardonal E2	Vaquerías (C80-9)	69.40%	3.30%	13.00%	0.70%	0.10%	0.00%	0.47%	0.10%
V17	Cardonal E5	Vaquerías (C274-T1)	75.96%	2.79%	9.77%	1.05%	0.69%	0.17%	1.22%	0.52%
Laz084	Cardonal Rec. Sup	Bicolor (camiseta?) sin CAT	49.76%	5.46%	7.92%	0.27%	0.27%	0.00%	0.00%	0.54%
C250-3	Cardonal E1	vaquerías	69.60%	5.60%	6.20%	0.00%	0.60%	0.00%	0.00%	0.20%
C26-T45	Cardonal E2	vaquerías	75.68%	2.90%	8.30%	0.19%	0.58%	0.00%	0.19%	0.19%
C84-T3	Cardonal E3	vaquerías	72.27%	2.40%	5.48%	0.34%	0.34%	0.00%	0.34%	0.00%
Laz083	Cardonal. Rec Sup	Vaquerías	77.37%	3.21%	5.14%	0.16%	0.32%	0.16%	0.00%	0.16%

Turm.	Granate	Carb	Anf-Pirx	Granito	L. Vol	Arenisca	Esquisto	Cuarcita	Pelitas	Arcillita	Fil-Piz.	V.Volc.	Gránulos	Ties Molido
0.00%	0.00%	0.00%	0.00%	6.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.17%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	8.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.54%	0.00%
0.12%	0.00%	0.00%	0.24%	1.32%	0.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.05%	0.00%	0.00%
0.55%	0.00%	0.00%	0.55%	2.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.55%	0.00%	0.00%
0.00%	0.00%	0.00%	0.24%	1.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%
0.00%	0.00%	0.00%	0.31%	5.69%	1.58%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.63%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	2.55%	0.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.56%	0.00%	0.00%
0.00%	0.00%	0.00%	0.62%	5.82%	2.07%	0.00%	0.62%	0.00%	0.00%	0.00%	0.00%	1.66%	0.00%	0.00%
0.18%	0.00%	0.00%	0.37%	7.67%	0.93%	0.00%	0.37%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	18.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	5.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.33%	0.33%	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.67%	0.00%	0.00%
0.67%	0.00%	0.00%	0.00%	24.33%	0.00%	0.00%	0.33%	0.00%	0.00%	1.00%	0.00%	0.00%	0.33%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%	0.00%
0.33%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.19%	0.77%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.32%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	14.56%	0.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.12%	0.00%	0.00%	0.00%	9.63%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.13%	0.00%	0.00%	0.26%	9.30%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%	0.00%
0.00%	0.00%	0.00%	0.12%	11.07%	0.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.12%	0.00%	0.00%
0.00%	0.00%	0.00%	0.24%	9.46%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%
0.33%	0.00%	0.00%	0.00%	9.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.33%	0.00%	0.00%	0.33%	16.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%	0.00%
0.00%	0.00%	0.00%	0.10%	4.33%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.72%	0.24%	0.00%

0.21%	0.21%	0.00%	0.21%	5.78%	1.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.41%	0.00%	0.00%
0.22%	0.00%	0.00%	0.22%	8.82%	0.66%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.99%	0.00%	0.00%
0.00%	0.00%	0.00%	0.16%	7.17%	0.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.26%	0.00%	0.00%
0.13%	0.00%	0.00%	0.00%	9.34%	0.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.75%	0.00%	0.00%
0.15%	0.00%	0.00%	0.00%	2.53%	0.00%	4.59%	1.74%	0.00%	0.00%	0.00%	25.63%	0.00%	0.00%	0.15%

0.00%	0.00%	0.00%	0.10%	5.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.14%	0.73%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.92%	0.00%	0.00%
0.21%	0.00%	0.00%	0.66%	1.97%	1.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.97%	0.00%	0.00%
0.00%	0.00%	0.00%	0.13%	0.53%	0.39%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.12%	0.00%	0.00%
0.14%	0.00%	0.00%	0.44%	5.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.30%	0.00%	0.10%	2.36%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.30%	0.00%	0.00%
0.15%	0.00%	0.00%	0.15%	9.27%	0.00%	0.00%	1.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.11%	0.00%	0.00%	7.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.13%	1.06%	0.00%	0.13%	4.52%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.26%	0.00%	0.00%
0.12%	0.00%	0.00%	0.26%	4.26%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.16%	0.00%	0.00%
0.15%	0.31%	0.00%	0.47%	4.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.10%	0.00%	0.00%	0.47%	4.60%	0.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.18%
0.10%	0.00%	0.00%	0.10%	9.57%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.30%	0.00%	0.00%
0.00%	0.00%	0.00%	0.10%	19.06%	0.00%	0.00%	7.49%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.10%	0.00%	0.00%	0.20%	9.32%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.11%	0.00%	0.00%
0.17%	0.00%	0.00%	0.17%	14.74%	0.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.35%	0.00%	0.00%
0.00%	0.00%	0.00%	0.29%	0.89%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.49%	0.00%	0.00%
0.20%	0.00%	0.00%	0.20%	17.57%	0.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%
0.27%	0.00%	0.00%	0.27%	6.55%	3.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.00%

0.00%	0.00%	0.00%	0.00%	10.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.47%	0.71%	0.23%	3.57%	1.66%	0.23%	0.00%	0.00%	13.80%	1.66%	0.23%	0.00%

0.22%	0.00%	0.00%	0.00%	0.00%	0.00%	16.71%	14.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

0.00%	0.00%	0.00%	0.16%	0.32%	0.00%	1.44%	0.00%	0.00%	0.00%	0.00%	4.81%	0.00%	1.12%	5.30%
0.00%	0.00%	0.00%	0.21%	0.00%	0.00%	1.91%	0.00%	0.00%	0.00%	0.00%	7.66%	0.00%	0.00%	4.68%
0.00%	0.00%	0.00%	0.89%	5.63%	2.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.40%	0.00%	0.00%	0.79%	0.00%	0.00%	0.00%	0.00%	2.37%	0.79%	0.00%	3.16%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.58%	0.00%	0.00%	0.00%	0.00%	7.37%	0.00%	0.00%	3.94%
0.00%	0.00%	0.00%	0.44%	0.00%	0.00%	1.10%	0.00%	0.00%	0.00%	0.00%	2.43%	0.66%	0.00%	7.07%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%	5.98%	0.00%	0.92%	3.68%
0.00%	0.00%	0.00%	0.20%	0.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.61%	0.00%	0.00%	1.22%	8.35%
0.00%	0.00%	0.00%	0.26%	0.00%	0.00%	1.03%	0.00%	0.00%	0.00%	0.00%	4.64%	0.51%	0.00%	3.86%
0.00%	0.00%	0.00%	0.25%	0.00%	0.00%	0.76%	0.00%	0.00%	0.00%	0.00%	5.85%	0.25%	0.00%	3.05%
0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	1.41%	0.23%	0.00%	0.00%	0.23%	5.67%	0.00%	0.23%	4.96%
0.00%	0.00%	0.00%	0.52%	4.71%	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.22%	0.52%	0.00%
0.00%	0.00%	0.00%	0.27%	0.00%	0.00%	10.38%	0.00%	0.00%	0.00%	0.00%	24.86%	0.00%	0.00%	0.00%
0.00%	0.00%	0.20%	0.20%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%	0.00%	12.80%	0.60%	0.40%	1.20%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.97%	0.00%	0.00%	0.00%	0.00%	7.92%	0.00%	2.08%	1.00%
0.00%	0.00%	0.00%	0.34%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	11.99%	0.68%	0.34%	2.74%
0.00%	0.00%	0.00%	0.16%	0.32%	0.00%	1.44%	0.00%	0.00%	0.00%	0.00%	4.82%	0.00%	1.12%	5.30%

Opac.	Total
0.67%	100.00%
0.17%	100.00%
0.00%	100.00%
0.24%	100.00%
0.55%	100.00%
0.73%	100.00%
0.31%	100.00%
0.28%	100.00%
1.66%	100.00%
0.93%	100.00%
0.33%	100.00%
0.23%	100.00%
0.66%	100.00%
0.33%	100.00%
0.67%	100.00%
0.33%	100.00%
0.38%	100.00%
0.24%	100.00%
0.12%	100.00%
0.67%	100.00%
0.12%	100.00%
0.48%	100.00%
0.33%	93.54%
0.33%	100.00%
0.72%	100.00%

0.31%	100.00%
0.66%	100.00%
0.49%	100.00%
0.25%	100.00%
0.31%	100.00%
0.69%	100.00%
0.14%	100.00%
0.66%	100.00%
0.26%	100.00%
0.29%	100.00%
0.39%	100.00%
0.38%	100.00%
0.11%	100.00%
0.66%	100.00%
0.12%	100.00%
0.78%	100.00%
0.75%	100.00%
0.51%	100.00%
0.00%	100.00%
0.40%	100.00%
0.53%	100.00%
1.49%	100.00%
0.20%	100.00%
0.27%	100.00%
0.25%	100.00%
0.00%	100.00%
0.00%	100.00%

0.33%	100.00%
0.21%	100.00%
1.18%	100.00%
0.40%	100.00%
0.26%	100.00%
0.22%	100.00%
0.23%	100.00%
0.20%	100.00%
0.26%	100.00%
0.25%	100.00%
0.10%	100.00%
0.52%	100.00%
0.27%	100.00%
0.40%	100.00%
0.00%	100.00%
0.34%	100.00%
0.32%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.	Qz	Fk	Plag	Micrcl.	Biot.	Musc.
C161-1	Rec. Sup.	Escudilla Vaquerías	72.08%	5.33%	5.10%	0.00%	0.22%	0.00%	0.22%	0.22%
C217-5	Rec. Sup.	Vaquerías	70.58%	3.12%	5.46%	0.00%	0.19%	0.10%	0.39%	0.19%
C206-T2	E 18 Cte. NO	Vaquerías	75.66%	2.22%	6.92%	0.00%	0.27%	0.00%	0.00%	0.00%
C217-1	Rec. Sup.	Vaq. Cuello restringido cilíndrico	80.54%	1.95%	5.84%	0.00%	0.32%	0.00%	0.00%	0.32%
					26.30%					
Laz247	R18 Cte. SO	Botellita Incisa Pulida (C682-T3)	87.63%	5.18%	5.29%	0.40%	0.20%	0.00%	0.40%	0.40%
Laz248	R18 Cte. SE	Cuenco gris pulido (C659-T3)	90.48%	2.92%	3.24%	0.16%	0.32%	0.00%	0.32%	0.64%
Laz246	R18 Cte. SE	Jarra Río Diablo (C659-T2)	70.06%	8.09%	11.09%	4.76%	0.79%	0.00%	1.12%	0.15%
Laz250	R18 Cte. NE	Jarrita Rojo Pulido (C213-T3)	82.63%	2.60%	7.29%	1.04%	1.56%	0.00%	1.04%	0.52%
Laz249	R18 Cte. SE	Jarra-Cánt Ord par delg (C660-T1)	53.48%	6.54%	20.56%	0.56%	0.56%	0.18%	2.06%	3.74%
C206-3	R18 Cte. NE	Olla ordinaria (Laz426)	55.18%	4.42%	25.37%	1.47%	0.59%	0.00%	2.51%	0.29%
V25	Rec sup	frag vaquerías C217-6	77.78%	3.36%	9.69%	0.94%	1.41%	0.00%	2.12%	0.47%
V41	E18 SE N2	frag vaquerías C653-5	71.18%	2.54%	6.78%	0.10%	0.10%	0.00%	0.10%	0.10%
V40	E18 SE N2	frag vaquerías C650-T1	71.47%	2.76%	5.52%	0.61%	0.30%	0.00%	0.30%	0.30%
V39	E18 NE N1	frag vaquerías C206-181	74.58%	4.04%	10.40%	1.16%	1.73%	0.00%	2.31%	0.58%
V42	E18 SE N2	frag vaquerías C654-T2	73.99%	2.91%	7.26%	0.19%	0.19%	0.00%	0.19%	0.19%
V24	Rec sup	frag vaquerías C217-10	74.07%	3.07%	9.92%	1.65%	0.23%	0.00%	0.23%	0.23%
BM 01	E18	Jarra gris pulida (C866-T1; sin Laz)	64.60%	3.31%	15.30%	1.02%	0.51%	0.00%	2.29%	1.27%
BM 02	E18	Cuenco gris pulido punto angular (C654-T1; Laz430)	55.95%	8.38%	11.30%	0.59%	2.08%	0.89%	1.48%	0.59%
BM 03	E18	Cuenco gris pulido punto angular (C678-37; Laz429)	56.63%	6.14%	22.97%	1.94%	1.61%	0.00%	2.58%	0.00%
BM 04	E18	Cuenco beige alisado (C655-20; sin Laz)	56.71%	6.83%	21.64%	1.59%	0.45%	0.45%	2.73%	1.59%
BM 05	E18	Olla ord. con pastillaje (C674-T1; Laz434)	52.88%	5.89%	19.27%	1.81%	0.68%	0.68%	3.85%	1.58%
BM 06	E18	Cuenco beige pulido (C651-5; Laz428)	80.43%	2.72%	8.99%	0.27%	0.27%	0.00%	2.45%	1.08%
BM 07	E18	Ollita gris pulida (C668-T5; Laz431)	78.37%	3.28%	8.22%	0.32%	0.32%	0.00%	3.28%	0.98%
BM 08	E18	Vaso/jarro beige pulido (C653-32; Laz438)	85.92%	1.32%	6.16%	0.88%	0.44%	0.00%	0.88%	0.88%
BM 09	E18	Olla ordinaria (C653-30; Laz440)	48.29%	8.77%	16.37%	3.21%	1.46%	0.29%	5.84%	1.75%
BM 10	E18	Jarra gris pulida (C659-1; sin Laz)	66.58%	3.76%	10.05%	1.00%	0.00%	0.00%	0.25%	0.25%
BM 11	E18	Olla inflexionada anaranjada (C206-182; sin Laz)	78.98%	5.69%	9.40%	0.28%	0.56%	0.00%	0.56%	0.56%

BM 12	E18	Jarra beige pulida (C660-T4; sin Laz)	54.86%	3.12%	15.27%	2.43%	0.34%	0.34%	5.55%	0.34%
BM 13	E18	fragmento ordinario (C208-T28; Laz427)	50.83%	6.05%	18.42%	3.42%	0.26%	0.26%	5.52%	3.94%
BM 14	E18	gris pulido inciso (C668-T2; Laz432)	70.39%	6.22%	12.45%	2.19%	0.36%	0.00%	0.36%	0.36%
BM 15	E18	ordinario con aplique al pastillaje (C208-T8; Laz433)	53.06%	6.07%	20.18%	1.50%	2.64%	0.56%	2.64%	1.50%
BM 16	E18	cuellito gris pulido (C670-13; Laz435)	83.88%	1.27%	11.48%	0.00%	0.42%	0.00%	0.42%	1.27%
BM 17	E18	borde con incisión (C212-T1; Laz436)	60.05%	5.41%	16.29%	0.51%	0.51%	0.00%	3.60%	2.57%
BM 18	E18	negro pulido vertical (C206-T12; Laz437)	78.60%	3.78%	9.77%	0.31%	0.94%	0.00%	0.94%	1.26%
BM 19	E18	borde de olla con tizne (C208-T29; Laz439)	57.96%	7.40%	12.12%	2.02%	0.33%	0.33%	1.68%	2.35%
BM 20	E18	borde ordinario (C206-T10; Laz441)	54.83%	7.75%	22.22%	1.80%	1.29%	0.25%	1.80%	1.55%
BM 21	E18	borde ordinario (C654-26; Laz442)	46.88%	8.62%	20.43%	2.79%	1.72%	0.86%	1.72%	2.58%
BM 22	E18	borde ordinario (C206-T13; Laz443)	50.20%	6.42%	15.93%	3.34%	2.57%	0.51%	4.11%	3.59%

Turm.	Granate	Anf-Pirx	Granito.	Arenisca	Esquisto	Arcillita	L. Volc.	Fil-Piz.	V.Volc.	gránulos	tiesto	Opac.	Total
0.00%	0.00%	0.00%	0.00%	3.19%	0.00%	0.00%	0.00%	10.70%	0.45%	0.22%	1.59%	0.68%	100.00%
0.00%	0.00%	0.10%	0.00%	2.53%	0.00%	0.00%	0.00%	7.80%	0.19%	0.39%	8.77%	0.19%	100.00%
0.00%	0.00%	0.00%	0.00%	2.49%	0.00%	0.00%	0.00%	6.37%	0.27%	1.38%	4.15%	0.27%	100.00%
0.00%	0.00%	0.00%	0.00%	0.97%	0.00%	0.00%	0.00%	6.17%	0.32%	0.97%	2.60%	0.00%	100.00%
0.10%	0.00%	0.10%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	100.00%
0.00%	0.00%	0.16%	0.64%	0.00%	0.16%	0.00%	0.00%	0.00%	0.64%	0.00%	0.00%	0.32%	100.00%
0.00%	0.00%	0.15%	3.34%	0.00%	0.00%	0.00%	0.15%	0.00%	0.15%	0.00%	0.00%	0.15%	100.00%
0.00%	0.00%	0.10%	2.60%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.52%	100.00%
0.18%	0.00%	0.00%	11.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.18%	100.00%
0.10%	0.44%	0.10%	9.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.29%	100.00%
0.00%	0.70%	0.23%	3.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	100.00%
0.00%	0.00%	0.10%	0.00%	2.24%	0.00%	0.56%	0.00%	9.89%	0.00%	0.00%	6.21%	0.10%	100.00%
0.00%	0.00%	0.30%	0.00%	2.45%	0.00%	0.00%	0.00%	4.60%	0.00%	1.28%	9.81%	0.30%	100.00%
0.00%	0.00%	0.58%	2.60%	0.00%	0.00%	0.00%	0.00%	0.00%	1.73%	0.00%	0.00%	0.29%	100.00%
0.00%	0.00%	0.19%	0.00%	4.01%	0.00%	0.00%	0.00%	6.69%	0.00%	1.52%	2.48%	0.19%	100.00%
0.00%	0.00%	0.23%	0.23%	1.89%	0.00%	0.00%	0.00%	5.67%	0.23%	1.41%	0.71%	0.23%	100.00%
0.25%	0.25%	0.25%	9.69%	0.00%	0.25%	0.00%	0.25%	0.00%	0.51%	0.00%	0.00%	0.25%	100.00%
0.00%	0.00%	0.89%	0.00%	0.00%	0.00%	0.00%	16.96%	0.00%	0.00%	0.00%	0.00%	0.89%	100.00%
0.00%	0.64%	0.00%	7.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.32%	100.00%
0.22%	0.00%	0.22%	7.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.45%	100.00%
0.00%	0.00%	0.22%	12.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.45%	100.00%
0.00%	0.00%	0.54%	1.63%	0.00%	0.00%	0.00%	0.27%	0.00%	0.81%	0.00%	0.00%	0.54%	100.00%
0.00%	0.00%	0.00%	2.30%	0.00%	0.00%	0.00%	0.32%	0.00%	1.64%	0.65%	0.00%	0.32%	100.00%
0.00%	0.00%	0.44%	0.88%	0.00%	0.00%	0.00%	0.88%	0.00%	0.44%	0.00%	0.00%	0.88%	100.00%
0.00%	0.00%	0.29%	12.28%	0.00%	0.29%	0.00%	0.29%	0.00%	0.58%	0.00%	0.00%	0.29%	100.00%
0.00%	0.00%	0.00%	0.50%	7.57%	0.00%	0.00%	0.00%	9.29%	0.00%	0.00%	0.00%	0.75%	100.00%
0.00%	0.00%	0.28%	3.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.00%	0.28%	100.00%

0.00%	0.00%	0.34%	16.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.04%	100.00%
0.26%	0.00%	0.26%	10.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.26%	0.00%	0.00%	0.26%	100.00%
0.00%	0.00%	0.36%	6.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.36%	0.00%	0.00%	0.73%	100.00%
0.00%	0.18%	0.56%	9.43%	0.00%	0.00%	0.00%	0.37%	0.00%	1.13%	0.00%	0.00%	0.18%	100.00%
0.00%	0.00%	0.42%	0.42%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.42%	100.00%
0.00%	0.00%	0.00%	9.53%	0.00%	0.77%	0.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.25%	100.00%
0.00%	0.00%	0.63%	0.94%	0.00%	0.00%	0.00%	0.31%	0.00%	1.89%	0.00%	0.00%	0.63%	100.00%
0.00%	0.00%	0.33%	14.14%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	0.00%	0.00%	1.01%	100.00%
0.00%	0.00%	0.25%	8.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%	100.00%
0.00%	0.00%	0.43%	12.25%	0.00%	0.00%	0.00%	0.43%	0.00%	0.00%	0.00%	0.00%	1.29%	100.00%
0.25%	0.00%	0.25%	12.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%	0.00%	0.00%	0.25%	100.00%

Corte N°	Tipo	Matriz	Cavid.	Qz	Fk	Plag
419-R1	Cántaro 419-R1	72.67%	8.55%	9.83%	0.64%	0.43%
401-b4-25	Jarro 401 b4-25 gris pulido (JO1)	82.37%	4.82%	5.94%	0.39%	0.56%
402-12	Cuenco 402-12 gris pulido (CU2)	84.47%	5.43%	6.18%	0.00%	0.45%
402-9	Escudilla 402-9 pintura roja	80.60%	5.74%	7.92%	0.00%	0.27%
402-6	Escudilla 402-6 naranja pulido	72.42%	4.83%	9.13%	1.03%	0.52%
403-1	Cuenco 403-1 gris pulido CU3	81.91%	4.02%	8.19%	0.14%	0.86%
405-4	Cerrado cántaro? 405-4 tosco pulido Est K	54.90%	7.13%	18.02%	0.79%	0.99%
406-5	fragmento 406-5 Est H.	82.78%	5.08%	7.63%	0.28%	0.56%
407-2	Cuenco 407-2 gris pulido (CU2)	84.36%	5.21%	6.16%	0.00%	0.47%
408-1	Cuenco 3 408-1	85.58%	3.96%	5.70%	0.63%	0.32%
467-12	Cuenco 467-12 CU2 gris pulido	75.82%	3.15%	11.81%	0.59%	0.59%
468-5	fragmento 468-5 cuadrícula 1 nivel 13	85.47%	4.49%	7.48%	1.07%	0.00%
469-2	Escudilla 469-2 gris pulida ES2	83.91%	3.29%	7.44%	0.17%	0.86%
471-1	Jarro ?? 471-1 Baño Blanco	68.90%	5.23%	7.30%	1.40%	0.30%
472-b2-26	Cuenquito 472-b2-26 gris pulido CU2	75.25%	5.32%	8.33%	0.46%	1.16%
473-1	Jarra 2 473-1 gris-negro super pulido	80.46%	4.11%	8.69%	0.48%	0.48%
Cat 473-18	Frag. Pint. Bandas negras zig-zag 473-18	80.81%	3.08%	8.33%	1.09%	0.54%
Cat 475-1	Frag. Pint. Línea roja 475-1	71.98%	5.82%	8.29%	0.88%	0.35%
478-3	Escudilla 2 478-3 tosca bruñida	67.18%	5.06%	17.18%	0.77%	0.46%
481-2	Cuenco 481-2 cuadrícula 1 nivel 26	65.52%	4.69%	18.16%	0.82%	0.82%
401-A7	Olla 401-A7 globular baño blanco? (OL1)	66.72%	6.63%	11.14%	2.41%	0.60%
401-M8	Olla 401-M8 baño blanco?	65.68%	7.28%	10.76%	1.11%	0.47%
402-R1	Olla o cántaro 402-R1 (varios niveles)	61.76%	5.39%	15.26%	3.05%	0.72%
407-R1	olla tosca 407-R1	50.18%	9.44%	12.41%	0.92%	0.37%
409-R1	Olla 409-R1 gris alisado	56.82%	6.25%	21.20%	1.56%	0.45%
466-R1	tosco 466-R1	59.80%	6.98%	18.27%	2.49%	0.33%
467-R1	Cántaro 467-R1	47.87%	7.97%	21.88%	3.27%	0.41%
469-R1	Cántaro 469-R1 o jarrita tosca	53.21%	6.74%	25.68%	3.10%	1.27%
472-M7	Tosco rojizo	70.01%	4.35%	11.82%	0.78%	0.31%
473-R1	tosco 473-R1	57.50%	5.06%	18.16%	2.30%	0.92%
480-1	tosco 480-R1	59.98%	5.07%	17.00%	1.50%	0.50%

Micrcl.	Biot.	Musc.	Turm.	Granate	Anf-Pirx	Lit. Gra.	Arenisca	Esquisto	Fil-Piz.	Lit. Vol
0.64%	1.07%	0.43%	0.00%	0.00%	0.21%	2.56%	0.64%	0.21%	0.00%	0.85%
0.00%	2.23%	0.18%	0.00%	0.00%	0.18%	0.37%	0.00%	0.00%	0.00%	0.18%
0.00%	1.21%	0.00%	0.00%	0.00%	0.45%	0.00%	0.00%	0.00%	0.00%	0.15%
0.00%	1.64%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.56%
0.00%	2.41%	0.69%	0.00%	0.00%	0.86%	0.00%	0.00%	1.38%	0.00%	2.24%
0.00%	2.59%	0.29%	0.00%	0.00%	0.14%	0.43%	0.00%	0.00%	0.00%	0.00%
0.79%	0.19%	0.19%	0.19%	0.19%	0.19%	0.00%	0.00%	0.19%	0.00%	6.34%
0.00%	1.41%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%
0.00%	0.95%	0.47%	0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.47%
0.32%	0.16%	0.63%	0.00%	0.00%	0.32%	0.16%	0.16%	0.00%	0.00%	0.47%
0.00%	2.16%	0.19%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.00%	1.18%
0.21%	0.00%	0.21%	0.00%	0.00%	0.00%	0.43%	0.43%	0.00%	0.00%	0.00%
0.00%	1.21%	0.00%	0.00%	0.00%	0.52%	0.00%	0.00%	0.00%	0.00%	0.35%
0.77%	0.93%	1.09%	0.00%	0.00%	0.46%	3.10%	0.14%	9.01%	0.00%	0.46%
0.00%	4.63%	0.46%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%	1.16%
0.00%	2.17%	0.24%	0.00%	0.00%	0.48%	0.00%	0.00%	0.00%	0.00%	0.48%
0.00%	1.27%	1.27%	0.00%	0.18%	0.36%	0.00%	0.00%	0.90%	0.00%	0.36%
0.00%	0.88%	0.17%	0.00%	0.00%	0.17%	0.00%	0.00%	0.00%	0.00%	1.59%
0.00%	1.84%	0.77%	0.15%	0.77%	0.15%	2.45%	0.00%	0.92%	0.00%	0.00%
0.00%	0.61%	1.02%	0.20%	0.00%	0.20%	5.71%	0.00%	1.84%	0.00%	0.00%
0.00%	1.51%	0.30%	0.00%	0.15%	0.30%	2.11%	0.00%	2.71%	0.45%	1.51%
0.00%	1.26%	0.16%	0.00%	0.00%	0.32%	4.43%	0.00%	3.16%	0.00%	2.05%
0.00%	1.61%	0.72%	0.54%	0.00%	0.18%	1.79%	0.00%	3.95%	0.00%	0.18%
0.18%	0.55%	0.37%	0.00%	0.00%	0.00%	5.51%	10.45%	9.26%	0.00%	0.00%
0.00%	1.12%	2.01%	0.10%	0.22%	0.22%	1.34%	0.00%	7.37%	0.00%	0.00%
0.00%	0.33%	0.50%	0.33%	0.00%	0.17%	5.31%	0.99%	3.99%	0.00%	0.00%
0.00%	1.43%	0.61%	0.00%	0.00%	0.20%	2.66%	0.00%	13.50%	0.00%	0.00%
0.00%	1.46%	2.00%	0.54%	0.00%	0.18%	2.91%	0.00%	2.91%	0.00%	0.00%
0.15%	0.62%	0.47%	0.00%	0.00%	0.15%	3.89%	0.00%	5.91%	0.00%	0.15%
0.00%	2.75%	1.60%	0.46%	0.00%	0.00%	6.20%	1.15%	3.44%	0.00%	0.00%
0.00%	0.76%	0.50%	1.27%	0.00%	0.25%	8.12%	1.00%	3.30%	0.00%	0.00%

V.Volc.	Opac.	Gran Arc	M. organ.	Tiesto	Total
0.85%	0.21%	0.21%	0.00%	0.00%	100.00%
2.60%	0.18%	0.00%	0.00%	0.00%	100.00%
1.51%	0.00%	0.15%	0.00%	0.00%	100.00%
2.46%	0.27%	0.00%	0.00%	0.00%	100.00%
4.31%	0.18%	0.00%	0.00%	0.00%	100.00%
1.29%	0.14%	0.00%	0.00%	0.00%	100.00%
1.19%	0.39%	0.00%	0.00%	8.32%	100.00%
0.85%	0.28%	0.00%	0.00%	0.00%	100.00%
1.71%	0.10%	0.00%	0.00%	0.00%	100.00%
1.43%	0.00%	0.00%	0.00%	0.16%	100.00%
3.94%	0.19%	0.19%	0.00%	0.00%	100.00%
0.00%	0.21%	0.00%	0.00%	0.00%	100.00%
1.90%	0.35%	0.00%	0.00%	0.00%	100.00%
0.77%	0.14%	0.00%	0.00%	0.00%	100.00%
2.31%	0.69%	0.00%	0.00%	0.00%	100.00%
1.93%	0.24%	0.24%	0.00%	0.00%	100.00%
1.63%	0.18%	0.00%	0.00%	0.00%	100.00%
6.52%	0.53%	2.82%	0.00%	0.00%	100.00%
1.38%	0.92%	0.00%	0.00%	0.00%	100.00%
0.00%	0.41%	0.00%	0.00%	0.00%	100.00%
3.16%	0.00%	0.30%	0.00%	0.00%	100.00%
1.90%	1.42%	0.00%	0.00%	0.00%	100.00%
1.26%	0.18%	3.41%	0.00%	0.00%	100.00%
0.00%	0.18%	0.18%	0.00%	0.00%	100.00%
0.89%	0.45%	0.00%	0.00%	0.00%	100.00%
0.17%	0.17%	0.00%	0.00%	0.17%	100.00%
0.00%	0.20%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
1.24%	0.15%	0.00%	0.00%	0.00%	100.00%
0.00%	0.46%	0.00%	0.00%	0.00%	100.00%
0.25%	0.50%	0.00%	0.00%	0.00%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.	Qz	Fk	Plag
442-1	ME Sondeo 3	Olla Tosca	72.29%	4.34%	6.75%	2.41%	3.61%
443-2	ME Sondeo 3	Tinaja tosca	60.24%	4.95%	10.85%	1.41%	3.07%
444-7	ME Sondeo 3	Cuenco	92.22%	2.28%	2.05%	0.00%	0.23%
442-3	ME Sondeo 3	frag. gris grabado Laz115 (G5)	77.94%	5.97%	5.79%	0.54%	0.72%
448-15	ME Sondeo 4	Tinaja fina	73.47%	3.69%	10.32%	0.98%	0.74%
448-18	ME Sondeo 4	Tinaja fina Negro sobre ante	84.19%	3.55%	3.55%	0.00%	0.64%
448-17	ME Sondeo 4	Cuenco alto Candelaria?	69.38%	4.20%	13.58%	2.96%	1.23%
448-14	ME Sondeo 4	Cuenco gris pulido	80.90%	1.57%	7.59%	0.52%	0.52%
449-16	ME Sondeo 4	Olla tosca globular	63.01%	6.24%	6.24%	1.50%	1.72%
447-20	ME Sondeo 4	Escudilla grande Aguada	88.23%	3.92%	2.20%	0.50%	0.24%
454-1	ME Sondeo 5	cuenco gris grabado	91.46%	1.58%	3.78%	0.00%	0.63%
454-4	ME Sondeo 5	cuenco beige grabado damero	92.19%	1.95%	2.18%	0.00%	0.22%
454-6	ME Sondeo 5	Tinaja tosca	67.37%	8.12%	9.56%	1.45%	1.45%

Micrcl.	Biot.	Musc.	Turm.	Granate	Anf-Pirx	Granito	Arenisca	Cuarcita	Pelitas	Lutita
0.00%	0.72%	0.00%	0.00%	0.00%	0.00%	8.67%	0.00%	0.00%	0.00%	0.00%
0.00%	4.48%	0.24%	0.00%	0.00%	0.00%	11.08%	0.94%	0.00%	0.00%	0.00%
0.00%	0.23%	0.00%	0.00%	0.00%	0.69%	0.23%	0.00%	0.00%	0.00%	0.00%
0.00%	1.45%	0.18%	0.00%	0.00%	0.18%	1.08%	1.45%	0.00%	0.00%	0.00%
0.00%	0.24%	0.50%	0.00%	0.00%	0.25%	0.98%	0.24%	0.00%	0.00%	0.00%
0.00%	0.97%	0.97%	0.00%	0.00%	0.00%	0.64%	0.32%	0.00%	0.00%	0.00%
0.00%	1.73%	0.24%	0.00%	0.00%	0.00%	5.68%	0.00%	0.00%	0.00%	0.00%
0.00%	1.31%	1.05%	0.00%	0.00%	0.00%	0.78%	0.00%	0.00%	0.00%	0.00%
0.00%	3.24%	0.00%	0.00%	0.00%	0.00%	15.05%	0.00%	0.00%	0.00%	0.00%
0.00%	0.24%	0.24%	0.00%	0.00%	0.25%	0.50%	0.00%	0.00%	0.00%	0.00%
0.00%	0.95%	0.32%	0.00%	0.00%	0.32%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.20%	0.22%	0.00%	0.00%	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.41%	0.22%	0.00%	0.00%	0.00%	4.16%	0.00%	0.00%	0.00%	0.00%

Piz-Fil.	Lit. Vol	V.Volc.	Opac.	Granulos	Tiesto	Total
0.00%	0.00%	0.00%	0.24%	0.97%	0.00%	100.00%
0.24%	0.00%	0.00%	0.47%	1.56%	0.47%	100.00%
0.00%	0.69%	0.69%	0.46%	0.00%	0.23%	100.00%
0.00%	0.18%	0.00%	0.54%	3.98%	0.00%	100.00%
0.24%	0.00%	6.39%	1.96%	0.00%	0.00%	100.00%
0.00%	0.00%	3.56%	1.61%	0.00%	0.00%	100.00%
0.00%	0.00%	0.50%	0.50%	0.00%	0.00%	100.00%
0.00%	0.00%	1.57%	4.19%	0.00%	0.00%	100.00%
0.60%	0.00%	0.43%	0.64%	1.03%	0.30%	100.00%
0.00%	0.98%	1.72%	0.74%	0.00%	0.24%	100.00%
0.00%	0.32%	0.32%	0.32%	0.00%	0.00%	100.00%
0.00%	1.30%	1.30%	0.22%	0.00%	0.00%	100.00%
0%	0.00%	0.41%	0.41%	6.44%	0.00%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.	Qz	Fk
541-9	Rec 19	Jarrita estilo cienága pintado	81.29%	2.15%	10.73%	0.31%
542-4	Rec 19	Cuenco ante pulido CU2	78.02%	2.72%	7.16%	0.49%
638-5	Rec 19	Cuenco gris pulido CU2	82.37%	3.16%	7.63%	0.26%
540-2	Rec 19	Tipo gris pulido	93.82%	2.35%	2.81%	0.28%
530-T3	Rec 19	Base de olla baño blanco	76.33%	6.98%	7.90%	0.55%
531-4	Rec 19	Tosco pulido	60.11%	6.62%	13.23%	0.76%
218	Rec 16	Cuenco 656-22 beige CU2	82.09%	5.22%	4.97%	0.00%
216	Rec 16	Jarro 1 655-T1	82.83%	1.93%	8.03%	0.28%
657-1	Rec 16	Antropomorfo gris	83.54%	4.36%	6.54%	0.24%
696-1	Rec 16	Cuenco 696-1 gris pulido	89.12%	1.12%	4.08%	0.23%
660-2	Rec 16	Gris pulido con clepsidra (Laz031)	73.85%	3.31%	13.58%	2.32%
658-84	Rec 16	Tosco delgado	54.28%	6.95%	21.66%	1.07%
656-5	Rec 16	Jarra 1 656-5	75.66%	2.96%	10.53%	1.97%
711-T1	Rec 16	Condorhausi ornitomorfo	60.92%	6.00%	21.11%	1.78%
660-12	Rec 16	Tosco Alisado	48.41%	8.19%	27.04%	1.09%
699-13	Rec 16	Tosco Rojizo	68.84%	3.93%	17.69%	1.71%

Plag	Micrcl.	Biot.	Musc.	Turm.	Granate	Anf-Pirx	Lit. Gran	Esquisto	Arenis	Pelitas
0.31%	2.76%	0.61%	0.31%	0.00%	0.00%	0.00%	1.22%	0.00%	0.00%	0.00%
1.23%	0.00%	1.73%	0.27%	0.00%	0.00%	1.97%	0.00%	0.00%	0.00%	0.00%
0.79%	0.00%	1.05%	0.26%	0.00%	0.26%	1.59%	0.00%	0.00%	0.00%	0.00%
0.09%	0.00%	0.19%	0.19%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%
0.73%	0.00%	0.73%	0.73%	0.00%	0.18%	0.55%	3.12%	0.37%	0.00%	0.00%
0.94%	0.00%	1.32%	1.70%	0.19%	0.00%	0.38%	13.99%	0.00%	0.00%	0.00%
0.75%	0.00%	1.24%	0.50%	0.00%	0.00%	1.49%	0.00%	0.00%	0.75%	0.00%
0.55%	0.00%	0.83%	0.00%	0.00%	0.00%	0.83%	1.38%	0.00%	0.00%	0.00%
0.48%	0.00%	0.97%	0.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.45%	0.00%	1.59%	0.68%	0.00%	0.00%	0.23%	0.23%	0.00%	0.00%	0.00%
1.65%	1.65%	0.66%	0.33%	0.00%	0.00%	0.00%	2.32%	0.00%	0.00%	0.00%
2.41%	0.00%	0.80%	3.74%	0.27%	0.00%	0.00%	8.82%	0.00%	0.00%	0.00%
0.99%	0.00%	0.33%	2.30%	0.00%	0.00%	0.00%	4.93%	0.00%	0.00%	0.00%
0.44%	0.00%	1.78%	0.44%	0.00%	0.22%	0.44%	5.55%	0.00%	0.00%	0.00%
1.09%	0.54%	3.00%	1.36%	0.27%	0.00%	0.00%	7.92%	0.00%	0.00%	0.00%
0.98%	0.00%	0.73%	0.24%	0.00%	0.00%	0.24%	4.91%	0.00%	0.00%	0.00%

Fil-Piz.	Lit. Volc.	V.Volc.	Opac.	Tiesto	Granulos	Total
0.00%	0.00%	0.00%	0.31%	0.00%	0.00%	100.00%
0.00%	1.23%	4.44%	0.74%	0.00%	0.00%	100.00%
0.00%	0.00%	2.10%	0.53%	0.00%	0.00%	100.00%
0.00%	0.09%	0.00%	0.09%	0.00%	0.00%	100.00%
0.00%	0.37%	0.73%	0.18%	0.00%	0.55%	100.00%
0.00%	0.38%	0.00%	0.38%	0.00%	0.00%	100.00%
0.00%	0.24%	1.00%	1.00%	0.00%	0.75%	100.00%
0.00%	2.78%	0.28%	0.28%	0.00%	0.00%	100.00%
0.00%	0.24%	2.42%	0.24%	0.00%	0.24%	100.00%
0.00%	0.45%	1.59%	0.10%	0.00%	0.13%	100.00%
0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	100.00%
0.00%	0.22%	0.22%	0.66%	0.22%	0.00%	100.00%
0.00%	0.00%	0.82%	0.27%	0.00%	0.00%	100.00%
0.00%	0.00%	0.49%	0.24%	0.00%	0.00%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.
560-T3	RS	Cuenco 560 T3 CU2 gris grabado	81.71%	4.26%
566-1	RS	Escudilla 566-1 gris pulida ES2	81.80%	3.36%
584-4	RS	Jarro 584-4 gris pulido JO2	77.87%	5.80%
553-1	RS	Jarro 1 553-1	87.12%	1.67%
552-T1	RS	Olla 552-T1 tosca OL1	74.78%	3.93%
587-T1	RS	Olla 587-T1 OL6	65.20%	6.08%
587-T6	RS	Cántaro 587-T6 (también frag 589-T2)	62.50%	6.16%

Qz	Fk	Plag	Micrcl.	Biot.	Musc.	Turm.	Granate	Anf-Pirx	Lit. Gra.	Arenisca
10.23%	0.28%	0.85%	0.00%	0.57%	0.85%	0.00%	0.00%	0.10%	0.00%	0.00%
9.80%	0.56%	0.56%	0.00%	1.40%	0.28%	0.00%	0.00%	0.56%	0.56%	0.00%
12.57%	0.00%	0.82%	0.00%	0.55%	1.37%	0.00%	0.00%	0.27%	0.00%	0.00%
5.02%	1.00%	1.17%	0.00%	0.67%	0.50%	0.00%	0.00%	0.00%	2.85%	0.00%
9.88%	1.27%	0.76%	0.25%	0.13%	0.25%	0.13%	0.25%	0.13%	4.44%	0.00%
14.25%	1.05%	3.98%	0.00%	2.31%	0.42%	0.84%	0.21%	0.84%	1.89%	0.00%
14.21%	2.05%	2.57%	0.17%	4.46%	0.86%	0.17%	1.54%	0.17%	4.97%	0.00%

Pelitas	Esquisto	Fil-Piz.	Lit. Vol	V.Volc.	Opac.	Gran Arc	M. organ.	Tiesto	Total
0.00%	0.00%	0.00%	0.10%	0.10%	0.10%	0.85%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.84%	0.28%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.55%	0.00%	0.10%	0.10%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	1.39%	0.38%	1.77%	0.13%	0.13%	0.00%	0.00%	0.00%	100.00%
0.00%	1.67%	0.00%	1.05%	0.00%	0.21%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.17%	0.00%	0.00%	0.00%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.	Qz	Fk
106-24	R47	Cántaro tosco 106-R2	51.58%	6.70%	16.96%	1.56%
53-T9	R47	Olla tosca incisa	56.81%	5.44%	14.53%	3.08%
125-1	R47	Escudilla tosca 137-46	55.36%	4.79%	16.58%	1.29%
140-55	R47	Olla o cántaro tosco 140-55	56.09%	7.10%	18.58%	1.04%
98-17	R47	Olla tosca alisada 98-17	54.24%	7.25%	15.57%	1.05%
129-40	R47	Olla o cántaro tosco inciso 96-62	61.89%	5.95%	14.10%	1.98%
186-52	R47	Olla o cántaro tosco pintada 186-52	58.61%	5.07%	16.87%	2.53%
96-56	R47	Olla o cántaro tosco grande 96-56	50.26%	8.32%	16.64%	1.80%
137-45	R47	Escudilla tosca excisa 137-45	51.05%	6.56%	20.37%	0.70%
115-9	R47	Olla tosca alisada 115-9	55.20%	7.84%	22.05%	1.22%
S/N (131-8)	R47	Olla Tosca 131-8	49.94%	8.06%	19.64%	0.75%
248-5	R47	Cántaro tosco 248-5	49.28%	8.42%	21.81%	0.86%
LA-AO-435	R47	Olla tosca LA-AO-435	51.87%	5.97%	21.27%	1.30%
130-16	R47	Tipo tosco micoso	48.35%	5.82%	20.80%	1.34%
107-6	R47	Jarra gris pulida 107-6	77.65%	4.28%	7.86%	1.42%
140-2	R47	Jarra gris pulida 140-2	86.30%	2.34%	6.69%	1.34%
53-14	R47	Jarra 2 53-14	83.06%	5.87%	6.07%	0.22%
98-1	R47	Jarra 2 98-1	72.35%	3.95%	10.73%	0.46%
22-41	R47	Jarro 2 22-41	81.81%	2.51%	6.27%	3.13%
34-13	R46	Jarra 1 34-13	64.28%	4.29%	15.14%	1.71%
75-66	R47	Jarra 1 75-66 líneas incisas	75.69%	2.13%	10.00%	1.52%
134SN	R47	Jarro 1 134 SN	63.73%	3.11%	16.58%	1.81%
98-3	R47	Jarro 2 98-3	75.69%	1.93%	9.59%	2.13%
186-17	R47	Jarro 2 gris pulido 186-17	80.33%	2.81%	10.11%	1.50%
115-5	R47	Jarra 1 gris pulido 115-5	79.90%	2.97%	8.22%	1.37%
391-5	R47	Vaso gris pulido 1 391-5	77.47%	7.56%	5.92%	0.49%
115-1	R47	Escudilla beige osc. 115-1	88.31%	3.06%	5.21%	0.18%
130-1	R47	Cuenco 2 130-1 gris pulido	91.47%	2.40%	4.93%	0.10%
101-4	R47	Cuenco 2 gris pulido 101-4	84.50%	4.43%	5.76%	0.44%
133-102	R47	Cuenco 2 gris pulido 133-102	86.40%	3.31%	4.42%	0.00%
31-6	R47	Cuenco 2 185-4 inciso grueso	65.44%	8.99%	13.59%	4.38%
132-5	R47	Cuenco gris pulido 132-5	84.35%	3.13%	8.29%	0.00%
115-3	R47	Cuenco gris pulido 115-3	80.97%	4.06%	7.64%	0.49%
49-39	R47	Cuenco 2 49-39 pintura roja/biege	91.00%	1.97%	4.39%	0.00%
185-20	R47	cuenco 2 185-20 gris pulido	90.00%	2.00%	5.00%	0.33%
43-3	R47	Olla 2 beige 43-3	93.19%	4.09%	1.73%	0.00%
43-12	R47	Olla 6 43-12 gris pulida	87.33%	2.51%	3.82%	0.00%
134-29	R47	Olla 1 134-29 triángulos incisos	69.09%	2.89%	10.98%	1.44%
96-4	R47	Olla 2 96-4	86.70%	2.38%	4.05%	0.71%

					10.92%	
A 4-4	R47	Motivo 27	69.03%	3.33%	12.68%	2.29%
40-8	R47	Urna Ciénaga	74.00%	3.75%	8.75%	3.75%
272-26	R47	Motivo 12 gris pulido	73.41%	6.83%	8.57%	0.14%
369-10	R63a	Cántaro tosco 14cm diametro	58.14%	5.76%	20.68%	0.78%
378-M1	R63a	Tosco grueso 13 mm	56.37%	7.16%	17.09%	2.31%
378-28	R63a	Cuenco 2 378-28	78.29%	2.82%	7.44%	0.20%
365-25	R63a	Jarro 2 365-25	80.24%	3.77%	7.54%	0.70%
378-7	R63a	Cuenco 2 378-7	91.50%	1.66%	5.00%	0.00%
380-13	R63a	Cuenco 2 380-13	92.18%	3.18%	3.50%	0.00%
368-35	R63a	Jarro 1 368-35	85.97%	0.61%	7.32%	2.44%
378-11	R63a	Jarra 1 378-11	81.89%	2.78%	8.17%	1.47%
378-12	R63a	Cuenco 2 378-12 gris pulido	90.00%	3.88%	3.34%	0.00%
385-19	R87	Cántaro tosco	62.03%	5.77%	14.42%	0.48%
384-2	R87	Cuenco 2 384-2 gris pulido	81.73%	3.32%	8.07%	0.00%
					14.95%	
370-253	R88	Olla o cántaro 370-253	55.90%	6.65%	14.85%	0.66%
370-446	R88	Cuenco 2 370-446	71.65%	3.54%	11.65%	0.51%
367-1	R88	Cuenco 5 367-1	79.58%	3.29%	5.86%	0.00%
370-517	R88	Aguada grabado	93.94%	2.59%	2.27%	0.10%
370-390	R88	aguada pintado	79.66%	2.74%	7.21%	0.50%
370-13	R88	Olla tosca 370-13	62.50%	5.68%	15.68%	0.45%
375-67	R88	Tinaja tosca 375-67	54.95%	9.70%	17.76%	2.96%
389-6	R19	Escudilla 1 gris incisa	84.00%	4.60%	6.00%	0.40%
387-6	R19	Olla 2 gris pulida	77.49%	2.87%	9.63%	0.20%

Plag	Micrcl.	Biot.	Musc.	Turm.	Granate	Carbonato	Anf-Pirx	Lit. Gra.	Arenisca
2.00%	0.89%	1.56%	2.68%	0.47%	0.00%	0.00%	0.10%	14.07%	0.22%
4.90%	0.00%	2.18%	3.81%	1.08%	0.00%	0.00%	0.00%	7.99%	0.00%
1.84%	0.74%	1.29%	0.55%	1.11%	0.00%	0.00%	1.29%	10.86%	0.00%
1.25%	0.83%	2.92%	5.21%	0.63%	0.00%	0.00%	0.10%	5.42%	0.00%
2.24%	2.11%	1.85%	3.43%	0.16%	0.00%	0.00%	0.10%	11.74%	0.26%
1.98%	0.00%	0.00%	1.76%	0.44%	0.00%	0.00%	0.00%	10.80%	1.10%
0.51%	0.00%	3.57%	2.36%	0.34%	0.00%	0.00%	0.00%	9.29%	0.00%
1.66%	0.00%	2.50%	2.63%	0.14%	0.00%	0.00%	0.10%	15.81%	0.00%
0.47%	0.47%	1.64%	1.17%	0.49%	0.00%	0.00%	0.23%	16.16%	0.00%
1.47%	0.73%	0.98%	0.98%	0.49%	0.00%	0.00%	0.24%	7.84%	0.00%
1.00%	0.25%	1.51%	3.00%	0.75%	0.00%	0.00%	0.25%	13.85%	0.00%
2.16%	0.43%	1.94%	1.94%	0.86%	0.00%	0.00%	0.21%	11.23%	0.00%
0.75%	0.56%	0.75%	2.42%	0.37%	0.00%	0.00%	0.00%	14.55%	0.00%
2.01%	1.12%	2.68%	3.35%	0.45%	0.00%	1.34%	0.00%	12.52%	0.00%
1.19%	0.23%	1.19%	1.19%	0.00%	0.00%	0.00%	0.00%	4.52%	0.00%
1.00%	0.00%	0.67%	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%
0.87%	0.65%	1.74%	0.22%	0.00%	0.00%	0.00%	0.22%	0.43%	0.00%
0.46%	0.00%	1.86%	0.23%	0.00%	0.00%	0.00%	0.46%	1.63%	0.20%
1.25%	0.00%	0.63%	0.00%	0.00%	0.00%	0.00%	0.32%	3.76%	0.00%
2.86%	1.14%	5.71%	0.28%	0.00%	0.00%	0.00%	0.57%	3.74%	0.00%
0.92%	0.00%	1.52%	2.43%	0.00%	0.00%	0.00%	0.31%	3.65%	0.00%
1.81%	0.00%	1.56%	1.56%	0.00%	0.00%	0.00%	1.29%	5.44%	0.00%
1.07%	0.00%	0.85%	1.92%	0.00%	0.00%	0.00%	0.00%	5.54%	0.00%
0.75%	0.00%	0.94%	1.87%	0.00%	0.00%	0.00%	0.37%	1.12%	0.00%
0.68%	0.00%	3.20%	0.46%	0.00%	0.00%	0.00%	0.23%	0.23%	0.00%
0.66%	0.00%	0.99%	0.49%	0.00%	0.00%	0.00%	0.66%	0.99%	0.00%
0.36%	0.00%	0.72%	0.18%	0.00%	0.00%	0.00%	0.18%	0.00%	0.00%
0.10%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.10%	0.40%	0.00%
0.66%	0.00%	0.89%	0.89%	0.00%	0.00%	0.00%	0.44%	0.00%	0.00%
0.37%	0.00%	2.19%	0.37%	0.00%	0.00%	0.00%	0.00%	1.10%	0.00%
1.38%	0.00%	0.69%	0.92%	0.00%	0.00%	0.00%	0.46%	3.46%	0.00%
0.37%	0.00%	2.02%	0.00%	0.00%	0.00%	0.00%	0.37%	0.00%	0.00%
1.14%	0.16%	1.30%	0.97%	0.00%	0.00%	0.00%	0.32%	0.16%	0.00%
0.66%	0.00%	0.66%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%	0.00%
0.99%	0.00%	0.34%	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.16%	0.00%	0.10%	0.31%	0.00%	0.00%	0.00%	0.00%	0.16%	0.00%
0.51%	0.00%	0.76%	0.76%	0.00%	0.00%	0.00%	0.76%	0.00%	0.00%
1.73%	0.00%	0.29%	4.04%	0.00%	0.00%	0.00%	0.87%	3.47%	0.00%
0.95%	0.00%	0.71%	0.24%	0.00%	0.00%	0.00%	0.47%	0.47%	0.00%

0.83%	0.00%	1.66%	2.70%	0.00%	0.00%	0.00%	0.00%	7.48%	0.00%
0.50%	0.25%	1.00%	0.75%	0.00%	0.00%	0.00%	0.00%	5.25%	1.00%
1.16%	0.00%	0.29%	0.44%	0.00%	0.00%	0.00%	0.73%	0.00%	0.29%
1.31%	0.26%	2.35%	1.57%	0.26%	0.00%	0.00%	0.26%	5.50%	0.00%
0.92%	0.92%	1.85%	1.38%	0.23%	0.00%	0.00%	0.23%	11.08%	0.23%
0.80%	0.00%	2.01%	0.00%	0.00%	0.00%	0.00%	0.80%	0.40%	0.00%
0.70%	0.00%	3.06%	0.70%	0.00%	0.00%	0.00%	0.94%	0.00%	0.00%
0.17%	0.00%	0.50%	0.17%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%
0.10%	0.00%	0.32%	0.10%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%
0.61%	1.22%	0.61%	0.61%	0.00%	0.00%	0.00%	0.00%	0.61%	0.00%
0.49%	0.32%	0.32%	0.32%	0.00%	0.00%	0.00%	0.00%	2.78%	1.14%
0.51%	0.00%	1.03%	0.00%	0.00%	0.00%	0.00%	0.10%	0.00%	0.40%
0.96%	0.24%	3.61%	1.20%	0.48%	0.00%	0.00%	0.48%	8.89%	0.00%
0.24%	0.00%	2.61%	0.00%	0.24%	0.00%	0.00%	0.47%	0.71%	0.00%
2.44%	0.00%	0.00%	4.21%	0.22%	0.00%	0.00%	0.44%	14.19%	0.44%
0.25%	0.00%	2.78%	0.76%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%
2.58%	0.00%	0.47%	0.00%	0.00%	0.00%	0.00%	0.95%	0.00%	0.00%
0.10%	0.00%	0.10%	0.10%	0.00%	0.00%	0.00%	0.10%	0.30%	0.00%
0.75%	0.23%	1.00%	0.50%	0.00%	0.00%	0.00%	1.00%	0.23%	0.50%
1.14%	1.59%	2.50%	2.50%	0.00%	0.00%	0.00%	0.00%	6.82%	0.00%
1.81%	0.00%	0.00%	2.96%	0.49%	0.00%	0.00%	0.00%	8.39%	0.98%
2.00%	0.00%	0.60%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%
1.02%	0.00%	1.02%	0.41%	0.00%	0.00%	0.00%	1.02%	4.30%	0.00%

Pelitas	Esquisto	Fil-Piz.	Lit. Vol	V.Volc.	Opac.	Gran Arc	M. organ.	Tiesto	Total
0.00%	0.89%	0.00%	0.00%	0.10%	0.22%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.18%	0.00%	0.00%	0.00%	100.00%
0.00%	0.55%	0.00%	2.28%	0.55%	0.92%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.83%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.34%	0.51%	0.00%	0.00%	0.00%	100.00%
0.00%	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.23%	0.23%	0.23%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.73%	0.23%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.75%	0.25%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.43%	0.43%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.22%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.47%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	1.00%	0.33%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.22%	0.00%	0.43%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	2.79%	4.42%	0.23%	0.23%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.32%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.61%	0.61%	0.61%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	1.04%	0.00%	2.07%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.43%	0.00%	0.21%	0.64%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	1.14%	1.14%	0.23%	0.23%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.66%	1.97%	0.33%	1.81%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.18%	1.08%	0.54%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.10%	0.20%	0.10%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.44%	0.89%	0.44%	0.22%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.37%	0.73%	0.37%	0.00%	0.00%	0.37%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.69%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.37%	0.37%	0.18%	0.00%	0.55%	100.00%
0.00%	0.00%	0.00%	0.32%	1.79%	0.19%	0.49%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.22%	0.44%	0.22%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.66%	0.34%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.16%	0.10%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.25%	0.76%	1.02%	0.76%	0.00%	0.76%	100.00%
0.00%	0.00%	0.00%	4.33%	0.58%	0.29%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.95%	1.19%	0.71%	0.47%	0.00%	0.00%	100.00%

0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.75%	0.25%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	2.62%	5.09%	0.29%	0.14%	0.00%	0.00%	100.00%

0.00%	2.35%	0.00%	0.00%	0.52%	0.26%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	2.21%	2.01%	3.02%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	1.18%	0.70%	0.47%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.50%	0.17%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.10%	0.32%	0.10%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.16%	0.00%	0.16%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.10%	0.00%	0.10%	0.54%	0.00%	0.00%	100.00%

0.00%	0.00%	0.00%	0.00%	0.96%	0.48%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.24%	0.71%	0.24%	1.42%	0.00%	0.00%	100.00%

0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	7.09%	0.75%	0.51%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	4.46%	0.70%	1.17%	0.94%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.30%	0.10%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	1.49%	3.73%	0.23%	0.23%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.23%	0.00%	0.91%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%

0.00%	0.00%	0.00%	1.20%	0.00%	0.40%	0.20%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	1.43%	0.00%	0.61%	0.00%	0.00%	0.00%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.
832-T4	R20	Condorhuasi (laz025 G7)	70.48%	5.35%
Olla 837-T1	R20	tosco	65.64%	3.45%
827-T1	R20	fragmento recipiente tosco grueso	65.45%	4.43%
839-2	R20	olla 1 gris pulida	96.37%	1.65%
824-2	R20	condorhuasi	68.01%	3.66%
Olla 820-1	R22	olla pulida	54.45%	9.96%
805-3	RecSup	Condorhuasi	61.71%	3.45%
805-9	RecSup	Condorhuasi	80.24%	1.72%

Qz	Fk	Plag	Micrcl.	Biot.	Musc.	Anf-Pirx	Granito	Fil-Piz.	L. Volc	V.Volc.
14.65%	0.93%	1.16%	0.00%	2.32%	0.46%	0.23%	4.19%	0.00%	0.00%	0.00%
8.64%	0.86%	2.24%	0.00%	2.60%	3.28%	0.00%	12.26%	0.00%	0.34%	0.00%
14.23%	1.84%	1.69%	0.46%	1.22%	0.76%	0.30%	8.71%	0.00%	0.15%	0.30%
1.18%	0.00%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.00%	0.10%	0.00%
11.58%	0.61%	0.61%	0.00%	1.52%	0.61%	0.30%	10.97%	0.00%	0.00%	0.61%
16.60%	2.03%	0.74%	0.00%	1.84%	0.74%	0.18%	11.62%	0.00%	0.00%	0.00%
35.59%										
19.35%	1.91%	1.91%	0.57%	1.72%	0.19%	0.57%	5.94%	0.00%	0.00%	0.00%
11.40%	1.29%	1.29%	0.00%	0.43%	0.21%	0.21%	1.29%	0.00%	0.64%	0.64%

Opac.	granulos	Total
0.00%	0.00%	100.00%
0.69%	0.00%	100.00%
0.46%	0.00%	100.00%
0.10%	0.00%	100.00%
1.22%	0.00%	100.00%
0.92%	0.00%	100.00%
0.77%	1.91%	100.00%
0.43%	0.00%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.
	Tolombón	San Pedro Rojo Grabado	79.04%	3.14%
	Tolombón	Vaquerías	74.19%	1.61%
3	Chimpa	Rec. Sup. Diaguita chileno o Vaq.?	55.75%	6.75%
6	Tolombón	Tinaja marrón/ante	86.20%	2.08%
7	Tolombón	Rojo y negro sobre sobre ante	80.24%	3.34%
8	Tolombón	tricolor	91.43%	2.86%
9	Ampajango I	tricolor guachipas	86.55%	1.65%
11	Bañado	Rojo pulido forma abierta	80.27%	3.82%
12	Caspinchango	Marrón sobre ante aguada forma cerrada	84.97%	3.40%
13	Masao	Tricolor rojo y negro sobre baño crema	75.24%	4.25%
Laz088	Lampacito	V antropom. Ante pulido (Vas. 9)	73.42%	5.74%
Laz089	Lampacito	Jarra dorsiv. Gris Pulido Grabado (Vas. 5)	92.08%	5.06%
Laz090	Lampacito	Cuenco Gris Pulido Grabado (Vas. 12)	76.48%	5.09%
Laz112	Ampajango IV. U II 14-196	Negro sobre ante Aguada Pintado	90.26%	2.89%
Laz113	Ampajango I RS U. V 14-196	Círculo con reticulado pintura negra	92.88%	2.56%
V45	Sajrapampa (Rec. Sup.)	Vaquerías (C1229-1)	73.48%	3.15%
Laz134	Tulor (sin procedencia)	Negro Pulido (sin nro. de CAT)	70.73%	2.52%
Laz131	Tolombón (56-2)	Candelaria? Ante rojizo Antropomorfo	73.82%	9.06%

Qz	Fk	Plag	Micrcl.	Biot.	Musc.	Turm.	Granate	Anf-Pirx	Granito	Arenisca
11.30%	0.10%	0.62%	0.10%	0.10%	0.10%	0.00%	0.00%	0.21%	0.00%	0.83%
4.16%	0.00%	0.23%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%	2.53%
10.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.75%
3.39%	0.52%	0.52%	0.26%	1.56%	0.26%	0.00%	0.00%	1.04%	0.00%	0.00%
7.38%	0.47%	0.95%	0.00%	0.95%	0.24%	0.00%	0.00%	0.95%	1.43%	1.20%
1.67%	0.00%	0.71%	0.00%	0.71%	0.00%	0.00%	0.00%	0.48%	0.24%	0.00%
7.80%	0.23%	0.47%	0.00%	0.71%	0.47%	0.00%	0.00%	0.23%	0.00%	0.00%
9.13%	0.21%	0.64%	0.21%	1.27%	0.42%	0.00%	0.00%	1.06%	0.00%	0.00%
6.44%	0.18%	0.36%	0.00%	0.89%	0.00%	0.00%	0.00%	0.36%	0.00%	0.00%
13.15%	0.77%	0.58%	0.19%	2.13%	1.55%	0.00%	0.00%	0.39%	0.00%	0.00%
7.21%	1.91%	0.54%	0.00%	0.82%	0.26%	0.00%	0.26%	0.26%	7.67%	0.00%
1.90%	0.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
9.42%	0.78%	0.78%	0.00%	1.18%	0.39%	0.00%	0.00%	0.39%	1.18%	0.00%
4.73%	0.27%	0.52%	0.00%	0.27%	0.52%	0.00%	0.00%	0.00%	0.27%	0.00%
3.01%	0.10%	0.31%	0.00%	0.10%	0.10%	0.00%	0.00%	0.10%	0.21%	0.00%
7.64%	0.67%	0.45%	0.00%	0.45%	0.45%	0.00%	0.00%	0.22%	0.00%	2.24%
10.31%	0.63%	5.26%	0.00%	0.21%	0.21%	0.00%	0.00%	0.84%	0.00%	0.00%
9.54%	1.67%	0.71%	0.00%	0.23%	0.23%	0.23%	0.00%	0.23%	1.67%	0.00%

Arcillita	Esquisto	Fil-Piz.	L. Volc.	V.Volc.	Opac.	Granulos	Tiesto	Total
0.70%	0.83%	2.73%	0.10%	0.00%	0.10%	0.00%	0.00%	100.00%
0.00%	0.00%	11.29%	0.00%	0.00%	0.23%	0.00%	5.53%	100.00%
0.00%	0.00%	18.00%	0.00%	0.25%	1.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	1.30%	1.04%	0.79%	1.04%	0.00%	100.00%
0.00%	0.00%	0.00%	0.95%	1.19%	0.24%	0.47%	0.00%	100.00%
0.00%	0.00%	0.00%	0.71%	0.00%	0.48%	0.71%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.95%	0.23%	0.71%	0.00%	100.00%
0.00%	0.00%	0.00%	0.64%	1.91%	0.21%	0.21%	0.00%	100.00%
0.00%	0.36%	0.00%	0.54%	2.14%	0.36%	0.00%	0.00%	100.00%
0.00%	0.58%	0.00%	0.39%	0.39%	0.39%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	1.09%	0.82%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.32%	0.32%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	3.92%	0.39%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.53%	0.10%	0.00%	0.00%	100.00%
0.67%	0.00%	4.75%	0.00%	0.22%	0.22%	2.47%	2.92%	100.00%
0.00%	0.00%	0.00%	5.29%	3.58%	0.42%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	2.38%	0.23%	0.00%	0.00%	100.00%

Corte N°	Procedencia	Tipo	Matriz	Cavid.	Qz	Fk	Plag	Micrcl.	Biot.	Musc.
L-C-R4	Las Cuevas I	Vaquerías	69.60%	4.96%	13.28%	0.32%	0.32%	0.00%	0.00%	0.00%
LC S7-CB.3/12	Las Cuevas I	Vaquerías	73.61%	4.61%	11.80%	0.55%	0.75%	0.00%	0.00%	0.00%
PG-S1 C5	Potrero Grande	Vaquerías	71.17%	4.98%	11.92%	0.71%	0.36%	0.00%	0.00%	0.18%
2.4/10	La Encrucijada	Vaquerías	72.76%	2.61%	4.26%	0.24%	0.24%	0.00%	0.00%	0.24%
43.3/16	Tres Cruces I	Negro sobre Crema	58.83%	4.70%	10.79%	0.28%	0.28%	0.00%	0.00%	0.00%
38.3/3	Tres Cruces I	Cerámica Ordinaria (Muestra 1)	55.53%	4.65%	3.98%	0.22%	0.22%	0.00%	0.00%	0.00%
41.8/1	Tres Cruces I	Alisado (Muestra 2)	60.15%	6.68%	5.94%	1.48%	0.74%	0.00%	0.25%	0.00%
43.2/71	Tres Cruces I	Pulido Irregular Gris (Muestra 3)	53.44%	4.59%	1.83%	0.00%	0.00%	0.00%	0.00%	0.00%
45.2/2	Tres Cruces I	Negro Bruñido (Muestra 4)	62.18%	3.93%	15.45%	0.90%	3.63%	0.00%	0.30%	0.30%
45.2/42	Tres Cruces I	Rojo Pulido Fino (Muestra 5)	75.67%	5.19%	12.86%	0.90%	0.22%	0.22%	0.45%	0.22%
38.4/50	Tres Cruces I	Gris grabado Cand III (Muestra 6)	67.52%	5.50%	10.55%	0.68%	1.14%	0.45%	0.22%	0.22%
39.1/8	Tres Cruces I	Tricolor (Muestra 7)	67.27%	5.62%	13.69%	1.31%	0.37%	0.10%	0.10%	0.10%
38. 6/42	Tres Cruces I	Negro sobre rojo (Muestra 8)	64.97%	2.99%	3.20%	0.53%	0.26%	0.00%	0.26%	0.26%
72.1/61	Las Cuevas V	Ordinario sup Alisada (Muestra 9)	51.55%	4.65%	0.34%	0.00%	0.18%	0.00%	0.00%	0.00%
74/8	Las Cuevas V	Pulido irregular Gris (Muestra 10)	52.93%	4.46%	2.90%	0.00%	0.44%	0.00%	0.22%	0.00%
74.1/48	Las Cuevas V	Ante pulido (Muestra 11)	69.06%	5.87%	7.47%	1.07%	0.53%	0.00%	0.27%	0.27%
71.1.3/22	Las Cuevas V	Negro Bruñido (Muestra 12)	52.43%	6.15%	1.07%	0.00%	0.26%	0.00%	0.00%	0.00%
73.1.2/25	Las Cuevas V	Gris Pulido SF (Muestra 13)	63.21%	6.12%	14.20%	0.40%	0.40%	0.00%	0.20%	0.40%
48/9	Alero TC 1	Ordinario (Muestra 14)	52.48%	7.52%	1.98%	0.00%	0.00%	0.00%	0.00%	0.00%
48/5	Alero TC 1	Pulido con p. roja (Muestra 15)	70.17%	2.77%	16.66%	2.77%	0.92%	0.00%	0.30%	0.30%
48/15	Alero TC 1	Bruñido Tipo SPA (Muestra 16)	60.87%	6.25%	11.45%	0.83%	6.45%	0.00%	1.04%	0.00%
QT1	Las Cuevas I	Pintura roja (21.3) Laz601	53.04%	5.98%	3.20%	0.85%	0.21%	0.00%	0.21%	0.21%
QT2	Las Cuevas V	Corrugado (74.1) Laz602	58.06%	4.43%	1.26%	0.15%	0.15%	0.00%	0.00%	0.00%
QT3	Las Cuevas V	Pintura roja (79.9) Laz603	50.94%	5.65%	4.76%	1.19%	0.29%	0.00%	0.29%	0.00%
QT4	Tres Cruces I	Pintura roja (45.3) Laz604	75.08%	3.19%	14.82%	0.56%	0.75%	0.00%	0.37%	0.56%
QT5	Tres Cruces I	Crema/rojo (45.2) Laz605	75.28%	2.54%	14.58%	1.85%	1.38%	0.00%	0.23%	0.69%
QT6	Tres Cruces I	Gris Inc/Grab (46.4.1) Laz606	72.38%	3.25%	10.85%	0.18%	0.18%	0.00%	0.36%	0.18%
QT7	Tres Cruces I	Ante Inciso (34.7) Laz622	63.21%	3.28%	6.89%	1.14%	0.49%	0.00%	0.32%	0.16%
QT8	Las Cuevas I	Negro inciso tipo SF (LC-0,40/0,60)	69.51%	3.63%	13.09%	0.18%	0.18%	0.00%	0.18%	0.18%
QT9	Las Cuevas I	Negro Bruñido (LC/ B.T3)	64.41%	3.84%	19.74%	1.53%	0.25%	0.51%	1.28%	1.53%
QT10	Tres Cruces I	Rojo Pintado e inciso (40.8/15)	72.84%	4.67%	19.78%	0.27%	0.54%	0.00%	0.27%	0.00%
QT11	Tres Cruces I	Negro Grabado (43.2/161)	76.73%	1.23%	13.69%	0.74%	0.24%	0.00%	0.24%	0.24%

Turm.	Granate	Carbonatos	Anf-Pirx	Granito	Arenisca	Esq	Cuarcita	Arcillita	Lutita	Fil-Piz.	L. Volc	V.Volc.	Gránulos	Ties Molido	Opac.
0.32%	0.00%	0.00%	0.16%	0.32%	0.64%	0.00%	0.00%	0.00%	0.00%	1.12%	0.00%	0.00%	0.00%	8.64%	0.32%
0.37%	0.00%	0.00%	0.18%	0.75%	0.18%	0.00%	0.00%	0.00%	0.00%	0.75%	0.00%	0.00%	0.00%	6.08%	0.37%
0.00%	0.00%	0.00%	0.36%	0.00%	1.96%	0.00%	0.00%	0.00%	0.00%	6.40%	0.00%	0.00%	0.00%	1.60%	0.36%
0.00%	0.00%	0.00%	0.00%	0.47%	1.89%	0.00%	0.00%	0.00%	0.00%	9.00%	0.00%	0.00%	0.00%	7.82%	0.47%
0.00%	0.00%	0.00%	0.00%	0.82%	7.18%	0.00%	0.00%	0.00%	0.00%	16.02%	0.00%	0.00%	0.00%	0.82%	0.28%
0.00%	0.00%	0.00%	0.22%	0.00%	5.31%	0.00%	0.00%	0.00%	0.00%	29.65%	0.00%	0.00%	0.00%	0.00%	0.22%
0.00%	0.00%	0.00%	0.25%	0.00%	4.96%	0.00%	0.00%	0.00%	0.00%	13.36%	0.00%	0.00%	0.00%	5.94%	0.25%
0.00%	0.00%	0.00%	0.00%	0.00%	3.21%	0.00%	0.00%	0.00%	0.00%	36.70%	0.00%	0.00%	0.00%	0.00%	0.23%
0.00%	0.00%	0.00%	1.51%	2.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.15%	3.03%	0.30%	0.00%	0.60%
0.00%	0.00%	0.00%	0.22%	2.03%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.45%	0.22%	0.45%	0.00%	0.45%
0.00%	0.00%	0.00%	1.14%	1.14%	2.98%	0.00%	0.00%	0.00%	0.00%	5.50%	0.00%	0.00%	0.45%	2.29%	0.22%
0.00%	0.00%	0.00%	0.10%	0.18%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.38%	4.50%	0.18%
0.00%	0.00%	0.00%	0.00%	0.00%	7.48%	0.00%	0.00%	0.00%	0.00%	14.97%	0.00%	0.00%	0.00%	0.00%	5.08%
0.00%	0.00%	0.00%	0.00%	0.00%	5.34%	0.00%	0.00%	0.00%	0.00%	37.76%	0.00%	0.00%	0.00%	0.00%	0.18%
0.00%	0.00%	0.00%	0.22%	0.00%	5.80%	0.00%	0.00%	0.00%	0.00%	32.37%	0.00%	0.00%	0.44%	0.00%	0.22%
0.00%	0.00%	0.00%	0.26%	0.27%	1.60%	0.00%	0.00%	0.00%	0.00%	10.40%	0.26%	0.00%	0.80%	1.60%	0.27%
0.00%	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	32.88%	0.00%	0.00%	0.00%	0.00%	1.33%
0.20%	0.00%	0.00%	0.20%	0.61%	0.00%	0.00%	0.00%	6.73%	0.00%	0.00%	0.40%	0.00%	0.00%	6.73%	0.20%
0.00%	0.00%	0.00%	0.00%	0.00%	2.97%	0.00%	0.00%	0.00%	0.00%	34.85%	0.00%	0.00%	0.00%	0.00%	0.20%
0.00%	0.00%	0.00%	0.30%	0.61%	0.61%	0.30%	0.00%	0.00%	0.00%	0.92%	0.30%	0.00%	0.61%	2.16%	0.30%
0.00%	0.00%	0.00%	1.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.45%	0.00%	0.00%	0.00%	0.62%
0.00%	0.00%	0.00%	0.21%	0.00%	8.12%	0.00%	0.85%	0.00%	0.00%	26.28%	0.00%	0.00%	0.00%	0.42%	0.42%
0.00%	0.00%	0.00%	0.00%	0.00%	3.79%	0.00%	0.79%	0.00%	0.00%	31.22%	0.00%	0.00%	0.00%	0.00%	0.15%
0.00%	0.00%	0.00%	0.29%	0.00%	7.14%	0.00%	0.59%	0.00%	0.00%	28.57%	0.00%	0.00%	0.00%	0.00%	0.29%
0.00%	0.00%	0.00%	0.37%	0.00%	3.00%	0.00%	0.00%	0.00%	0.00%	0.37%	0.18%	0.00%	0.00%	0.00%	0.75%
0.00%	0.00%	0.00%	0.46%	0.69%	0.46%	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.92%	0.00%	0.69%
0.00%	0.00%	0.00%	0.54%	0.00%	1.08%	0.00%	0.00%	0.00%	0.00%	9.02%	0.00%	0.00%	0.00%	0.90%	1.08%
0.16%	0.00%	0.00%	0.32%	1.14%	0.65%	0.00%	0.00%	0.00%	0.00%	0.16%	0.00%	0.00%	2.79%	18.80%	0.49%
0.00%	0.00%	0.00%	0.36%	0.16%	1.81%	0.00%	0.00%	0.00%	0.00%	8.00%	0.00%	0.00%	0.00%	2.54%	0.18%
0.00%	0.00%	0.00%	0.25%	6.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.25%
0.00%	0.00%	0.00%	0.27%	0.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.00%	0.00%	0.00%	0.27%
0.00%	0.00%	0.00%	0.24%	2.47%	1.73%	0.00%	0.00%	0.00%	0.00%	0.49%	0.24%	0.24%	0.00%	0.74%	0.74%

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Corte N°	Procedencia	Tipo	Matriz
31984	Laz744 - La Ciénaga	Rojo sobre Ante	70.78%
33907	Laz752 - La Ciénaga	Gris Pulido Inciso	89.04%
32192	Laz734 - La Ciénaga	Gris Pulido Grabado (simil San Rafael Grabado)	87.04%
29411	Laz724 - La Ciénaga	Gris Pulido Inciso	77.05%
32108	Laz747 - La Ciénaga	Gris Pulido Grabado (simil San Rafael Grabado)	78.09%
31998	Laz746 - La Ciénaga	Rojo sobre Ante	68.62%
31936	Laz739 - La Ciénaga	Gris Pulido Inciso	79.96%
32315	Laz728 - La Ciénaga	La Manga Inciso y Pintado Rojo sobre Ante	76.49%
31981	Laz743 - La Ciénaga	Aguada Pintado	81.71%
33899	Laz751 - La Ciénaga	Aguada Pintado	81.89%
32111	Laz748 - La Ciénaga	Ante Pulido Inciso	79.49%
32180	Laz732 - La Ciénaga	La Manga Inciso y Pintado Rojo sobre Ante	77.79%
32185	Laz733 - La Ciénaga	Gris Pulido Grabado (simil San Rafael Grabado)	68.83%
31945	Laz740 - La Ciénaga	Ante Pulido Inciso	82.23%
32196	Laz735 - La Ciénaga	Gris Pulido Inciso y Modelado	72.69%
31932	Laz738 - La Ciénaga	Ante Pulido Inciso	83.10%
31907	Laz737 - La Ciénaga	Aguada Gris Pulido Grabado	90.03%
29473	Laz726 - La Ciénaga	Ante Pulido Inciso	62.62%
31995	Laz745 - La Ciénaga	Negro sobre Ante	80.10%
32179	Laz731 - La Ciénaga	Gris Pulido Inciso	82.14%
29468	Laz725 - La Ciénaga	La Manga Inciso y Pintado Rojo sobre Ante	76.86%
29375	Laz723 - La Ciénaga	Gris Pulido Inciso	71.77%
33891	Laz736 - La Ciénaga	Gris Pulido Inciso	84.15%
31972	Laz742 - La Ciénaga	Rojo sobre Ante	71.92%
32318	Laz729 - La Ciénaga	Rojo sobre Ante	71.69%
29529	Laz727 - La Ciénaga	Rojo sobre Ante	78.84%
32083	Laz730 - La Ciénaga	Aguada Gris Pulido Grabado	93.43%
32211	Laz749 - La Ciénaga	Gris Pulido Inciso	73.71%
32214	Laz750 - La Ciénaga	Gris Pulido Grabado (Ciénaga III)	76.00%
31946	Laz741 - La Ciénaga	Gris Pulido Inciso	80.29%

Cavid.	Qz	Fk	Plag	Micrcl.	Biot.	Musc.	Turm.	Granate
7.75%	8.51%	2.46%	0.38%	0.57%	0.57%	1.89%	0.00%	0.00%
3.78%	3.78%	1.00%	0.20%	0.00%	0.80%	0.00%	0.00%	0.00%
1.87%	5.19%	0.86%	0.29%	0.14%	0.58%	0.14%	0.00%	0.00%
5.18%	9.84%	0.10%	1.03%	0.00%	1.29%	0.51%	0.00%	0.00%
3.54%	11.22%	0.98%	0.39%	0.19%	0.98%	0.39%	0.00%	0.00%
7.16%	8.19%	0.43%	1.31%	0.29%	0.14%	0.14%	0.00%	0.00%
7.09%	4.11%	2.05%	0.79%	0.16%	2.22%	1.73%	0.00%	0.00%
3.77%	8.42%	2.33%	0.73%	0.14%	1.16%	1.45%	0.00%	0.00%
1.94%	6.46%	0.86%	0.43%	0.00%	1.08%	0.43%	0.00%	0.00%
2.49%	7.30%	0.50%	0.83%	0.00%	1.33%	0.00%	0.00%	0.00%
4.61%	7.52%	0.34%	0.51%	0.00%	1.19%	0.34%	0.00%	0.00%
4.09%	7.61%	1.79%	0.48%	0.16%	0.16%	0.97%	0.00%	0.00%
4.33%	13.20%	1.51%	0.86%	0.00%	1.29%	0.21%	0.00%	0.00%
2.35%	7.71%	1.28%	0.21%	0.21%	1.07%	0.85%	0.00%	0.00%
4.52%	8.17%	2.78%	0.52%	0.35%	1.74%	2.26%	0.00%	0.00%
3.27%	4.14%	0.69%	1.89%	0.17%	0.51%	0.17%	0.00%	0.00%
3.57%	3.24%	0.34%	0.17%	0.00%	0.51%	0.17%	0.00%	0.00%
6.63%	16.99%	3.45%	2.76%	0.00%	0.27%	0.13%	0.00%	0.00%
4.06%	6.82%	0.37%	0.55%	0.00%	1.48%	0.18%	0.00%	0.00%
3.16%	5.79%	0.52%	0.52%	0.70%	0.70%	0.52%	0.00%	0.00%
3.02%	7.69%	0.88%	0.75%	0.38%	0.75%	2.77%	0.10%	0.00%
5.18%	11.66%	1.19%	1.29%	0.00%	1.29%	1.29%	0.00%	0.00%
2.16%	6.47%	0.59%	1.37%	0.19%	0.59%	0.19%	0.00%	0.00%
2.53%	14.86%	0.74%	1.04%	0.29%	1.18%	2.09%	0.00%	0.00%
5.89%	10.07%	0.43%	0.72%	0.14%	2.59%	0.29%	0.00%	0.00%
4.41%	7.89%	0.66%	2.67%	0.40%	0.53%	0.26%	0.00%	0.00%
2.28%	2.47%	0.38%	0.19%	0.00%	0.38%	0.19%	0.00%	0.00%
4.35%	8.21%	1.43%	0.82%	0.61%	0.61%	3.08%	0.00%	0.00%
4.80%	10.60%	0.20%	0.20%	0.00%	1.60%	0.80%	0.00%	0.00%
4.16%	7.84%	0.18%	0.74%	0.00%	1.47%	0.37%	0.00%	0.00%

Carbonato	Anf-Pirx	Granito	Arenisca	Pelitas	L.- Volc.	Fil-Piz.	V.Volc.	Ties Molido
0.00%	0.10%	6.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%
0.00%	0.14%	0.72%	0.00%	0.00%	0.29%	0.00%	2.16%	0.00%
0.00%	0.51%	1.03%	0.00%	0.00%	0.10%	0.00%	3.10%	0.00%
0.00%	0.59%	0.19%	0.00%	0.00%	0.10%	0.00%	2.75%	0.00%
0.00%	0.29%	1.46%	0.29%	0.00%	1.75%	0.00%	9.79%	0.00%
0.00%	0.00%	1.73%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	5.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.21%	0.43%	0.21%	0.00%	0.64%	0.00%	4.96%	0.00%
0.00%	0.16%	0.16%	0.16%	0.00%	0.16%	0.00%	4.69%	0.00%
0.00%	1.02%	0.17%	0.00%	0.00%	0.00%	0.00%	4.64%	0.00%
0.00%	0.16%	5.02%	1.13%	0.00%	0.00%	0.00%	0.48%	0.00%
0.00%	0.65%	0.21%	0.00%	0.00%	0.43%	0.00%	8.27%	0.00%
0.00%	0.21%	0.21%	0.00%	0.00%	0.42%	0.00%	3.04%	0.00%
0.00%	0.17%	6.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.34%	0.86%	0.00%	0.00%	0.51%	0.00%	4.18%	0.00%
0.00%	0.17%	0.10%	0.00%	0.00%	0.17%	0.00%	1.36%	0.00%
0.00%	0.13%	6.21%	0.00%	0.00%	0.00%	0.00%	0.27%	0.13%
0.00%	0.55%	0.55%	0.00%	0.00%	0.18%	0.00%	4.98%	0.00%
0.00%	0.52%	1.23%	0.00%	0.00%	0.35%	0.00%	3.68%	0.00%
0.00%	0.12%	6.18%	0.00%	0.00%	0.00%	0.00%	0.12%	0.00%
0.10%	0.64%	1.07%	0.00%	0.00%	0.64%	0.00%	3.45%	0.00%
0.00%	0.39%	0.19%	0.00%	0.00%	0.19%	0.00%	3.33%	0.00%
0.00%	0.15%	2.67%	0.00%	0.00%	0.15%	0.00%	2.09%	0.00%
0.00%	0.14%	7.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.53%	1.33%	0.00%	0.00%	0.13%	0.00%	2.09%	0.00%
0.00%	0.10%	0.10%	0.00%	0.00%	0.00%	0.00%	0.38%	0.00%
0.00%	0.20%	6.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.40%	0.60%	0.00%	0.00%	0.40%	0.00%	3.60%	0.00%
0.00%	0.37%	0.55%	0.00%	0.00%	0.18%	0.00%	3.48%	0.00%

Opac.	Total
0.19%	100.00%
0.20%	100.00%
0.58%	100.00%
0.26%	100.00%
0.59%	100.00%
0.14%	100.00%
0.16%	100.00%
0.00%	100.00%
0.64%	100.00%
0.33%	100.00%
0.17%	100.00%
0.16%	100.00%
0.21%	100.00%
0.21%	100.00%
0.35%	100.00%
0.17%	100.00%
0.17%	100.00%
0.41%	100.00%
0.18%	100.00%
0.17%	100.00%
0.38%	100.00%
0.43%	100.00%
0.19%	100.00%
0.29%	100.00%
0.14%	100.00%
0.26%	100.00%
0.10%	100.00%
0.82%	100.00%
0.80%	100.00%
0.37%	100.00%

Corte N°	C. Lab	Procedencia
MAL 01	Laz668	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 10
MAL 02	Laz669	posiblemente capa 1 del montículo mayor del sitio I-0
MAL 03	Laz670	posiblemente capa 14 del montículo mayor del sitio C-1
MAL 04	Laz671	posiblemente capa 8 del montículo mayor del sitio C-0
MAL 05	Laz672	posiblemente capa 6 del montículo mayor del sitio C-0
MAL 06	Laz673	posiblemente capa 2 del montículo mayor del sitio I-0
MAL 07	Laz674	posiblemente capa 9 del montículo mayor del sitio M-1
MAL 08	Laz675	posiblemente capa 4 del montículo mayor del sitio C-0
MAL 09	Laz676	posiblemente capa 2 del montículo mayor del sitio K-0
MAL 10	Laz677	posiblemente capa 2 del montículo mayor del sitio K-0
MAL 11	Laz678	posiblemente capa 4 del montículo mayor del sitio I-0
MAL 12	Laz679	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 11
MAL 13	Laz680	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 11
MAL 14	Laz681	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 11
MAL 15	Laz682	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 11
MAL 16	Laz683	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 11
MAL 17	Laz684	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 12
MAL 18	Laz685	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 12
MAL 19	Laz686	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 12
MAL 20	Laz687	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 10
MAL 21	Laz688	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 09
MAL 22	Laz689	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 09
MAL 23	Laz690	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 13
MAL 24	Laz691	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 13
MAL 25	Laz692	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 04
MAL 26	Laz693	U. H1. M1. R1/7
MAL 27	Laz694	U. H1. M1. R1/7
MAL 28	Laz695	U. H1. M1. R1/7
MAL 29	Laz696	U. H1. M1. R1/7
MAL 30	Laz697	U. H1. M1. R1/7
MAL 31	Laz698	U. H1. M1. R1/7
MAL 32	Laz699	U. H1. M1. R1/7
MAL 33	Laz700	U. H1. M1. R1/7
MAL 34	Laz701	U. H1. M1. R1/7
MAL 35	Laz702	U. H1. M1. R1/7
MAL 36	Laz703	U. D1. M2. Piso inferior
MAL 37	Laz704	U. D. M4. H1
MAL 38	Laz705	U. D. M4. H1
MAL 39	Laz706	U. D. M4. H1
MAL 40	Laz707	U. D. M4. H1
MAL 41	Laz708	U. D. M 6/R3
MAL 42	Laz709	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 10
MAL 43	Laz710	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 10
MAL 44	Laz712	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 10
MAL 45	Laz711	Sitio B-0. montículo mayor. Pozo de sondeo. Capa 10
MAL 46	Laz713	Alamito. Mesada El Arbolito
MAL 47	Laz714	Alamito. Mesada El Arbolito
MAL 48	Laz715	Alamito. Mesada El Arbolito
MAL 49	Laz716	Alamito. Mesada El Arbolito
MAL 50	Laz717	Alamito. Mesada El Arbolito
MAL 51	Laz718	Alamito. Mesada El Arbolito
MAL 52	Laz719	Alamito. Mesada El Arbolito
MAL 53	Laz720	Alamito. Mesada El Arbolito
MAL 54	Laz721	Alamito
MAL 55	Laz722	Alamito

Tipo	Matriz	Cavid.	Qz	Fk	Plag
Jarra Río Diablo	56.42%	6.02%	18.50%	1.24%	1.24%
Rojo sobre Blanco (Condorhuasi)	63.80%	3.12%	18.02%	0.86%	0.52%
Frag con aplique e incisión Ordinario Alisado	59.77%	4.54%	15.07%	1.13%	0.65%
Frag asa Gris Pulido	85.25%	3.40%	4.64%	0.61%	0.30%
Frag asa Ordinario Alisado paredes delgadas	57.88%	3.66%	14.39%	0.52%	1.04%
Frag Blanco sobre Rojo	64.83%	4.12%	11.67%	2.66%	0.27%
Frag de Jarrita Alisado paredes delgadas	69.32%	5.48%	10.60%	4.39%	0.73%
frag asa Alisado	69.69%	5.51%	14.38%	2.13%	0.35%
frag Ciénaga Negro sobre Blanco	78.82%	5.79%	5.59%	2.51%	0.19%
frag Ciénaga Negro sobre Ante	89.37%	2.03%	6.09%	0.50%	0.50%
frag Ciénaga Gris Pulido Inciso	71.91%	4.64%	8.19%	3.55%	1.09%
frag ordinario delgado pintura roja y tizne	62.33%	6.18%	9.50%	1.80%	0.75%
frag recipiente cerrado ordinario de pared alisada	52.23%	4.45%	7.37%	1.54%	0.27%
frag recipiente cerrado ordinario pulido	65.37%	5.89%	12.10%	3.66%	0.39%
frag borde recip delgado Inciso (rombos, Alpatauca?)	48.62%	11.88%	18.23%	3.68%	0.61%
frag blanco/rojo en sup. externa. Alisado e inciso	53.01%	6.05%	12.67%	4.64%	0.42%
frag borde recipiente gris pulido inciso (jarrita?)	58.70%	7.36%	15.67%	3.56%	0.71%
ordinario con líneas incisas	48.57%	10.02%	17.88%	1.35%	1.08%
gris pulido inciso Río Diablo	68.76%	5.55%	16.67%	0.29%	0.87%
Frag. jarra gris incisa alisada	60.29%	4.34%	14.13%	1.30%	1.08%
fragmento Condorhuasi inciso.	59.76%	5.89%	19.71%	0.61%	0.82%
gris pulido puntos incisos gruesos	66.53%	4.33%	11.63%	1.18%	0.39%
fragmento patita Condorhuasi	73.43%	3.44%	9.37%	0.95%	1.25%
fragmento gris pulido inciso puntos gruesos	57.98%	5.86%	11.70%	2.13%	3.45%
fragmento ordinario alisado	68.38%	2.35%	9.47%	0.35%	0.35%
Pintura Roja	67.11%	3.45%	12.66%	0.86%	0.28%
Pintura Roja	76.38%	4.26%	10.90%	0.47%	0.47%
Pintura Morada	54.87%	6.17%	14.28%	0.96%	0.19%
Olla 2 con tizne borde engrosado	55.43%	8.40%	12.17%	1.30%	0.43%
Olla 3 con tizne borde en bisel	57.77%	6.77%	9.51%	1.13%	0.96%
Olla 4 con tizne borde redondeado	61.03%	5.32%	15.06%	0.96%	0.80%
Olla 1 borde recto Ante Alisado	72.66%	7.23%	13.08%	0.34%	0.86%
Jarra Ciénaga Rojo sobre Ante	61.03%	4.21%	19.96%	0.73%	0.91%
frag cuello de un recipiente ordinario alisado	53.09%	7.88%	17.24%	5.50%	1.46%
frag borde: Cuenco de pasta intermedia	69.00%	4.70%	11.91%	2.50%	1.25%
frag olla pulida gris-negro inciso	77.00%	0.97%	12.77%	3.05%	0.97%
frag borde. Cuenco ante punto angular, fig sólidas negra	76.75%	4.37%	11.98%	2.07%	0.69%
frag. Ciénega líneas negras sobre crema	67.21%	6.31%	10.51%	1.61%	0.80%
frag. Negro/gris pulido. Líneas y puntos incisos	68.35%	2.14%	19.70%	1.07%	0.21%
Ordinario modelado inciso	51.72%	4.92%	12.87%	0.31%	0.95%
frag cuello y borde de rec cerrado Condorhuasi	74.29%	1.65%	16.04%	1.19%	0.94%
Ordinario líneas gruesas de pintura roja	50.04%	8.10%	11.34%	0.92%	1.38%
Ordinario líneas finas de pintura roja	52.63%	7.65%	10.61%	0.74%	0.24%
Frag. cuerpo de olla. Con pintura blanca postcocción?	55.67%	7.92%	15.32%	0.79%	0.26%
Ordinario Alisado con pintura roja int / ext	53.44%	6.83%	8.85%	1.24%	0.46%
Frag cuerpo. Engobe blanco y pintara morada/roja	49.96%	5.63%	12.42%	2.91%	0.77%
Frag de borde engr, Olla Condorhuasi. blanco sobre rojo	69.09%	4.18%	11.70%	1.04%	0.75%
Gris Pulido Inciso	83.10%	3.72%	7.67%	0.69%	0.69%
Jarro Ciénaga Gris Negro inciso.	83.21%	5.85%	9.26%	0.24%	0.24%
Gris pulido líneas incisas espinado	63.45%	4.33%	14.63%	2.16%	0.81%
Líneas negras sobre pasta ante (Ciénaga)	57.06%	6.07%	17.99%	1.86%	0.93%
Recipiente pequeno Negro Pulido Inciso	72.04%	9.09%	9.59%	1.01%	0.50%
Cuenco/escudilla Gris Pulido Inciso	79.19%	4.02%	11.47%	1.21%	0.40%
Olla Ordinario Alisado	47.50%	7.20%	15.96%	1.41%	1.97%
Ordinario Alisado paredes delgadas	49.18%	7.07%	16.16%	2.46%	1.31%

Micrcl.	Biot.	Musc.	Turm.	Granate	Zircón	Carbonato	Anf-Pirx	Granito	Esquisto
0.20%	1.03%	1.45%	0.00%	0.20%	0.00%	0.00%	0.20%	12.88%	0.00%
0.00%	3.64%	0.69%	0.17%	0.00%	0.17%	0.00%	0.17%	8.32%	0.00%
0.00%	5.19%	2.11%	0.16%	0.00%	0.10%	0.00%	0.16%	10.21%	0.65%
0.30%	0.30%	0.30%	0.00%	0.00%	0.00%	0.00%	0.30%	2.46%	0.00%
0.00%	2.09%	2.36%	0.26%	0.00%	0.00%	0.00%	0.26%	14.66%	2.36%
0.00%	1.73%	0.66%	0.13%	0.13%	0.00%	0.00%	0.13%	12.48%	0.93%
0.18%	0.36%	1.46%	0.00%	0.00%	0.00%	0.00%	0.18%	6.03%	0.00%
0.17%	1.06%	1.42%	0.17%	0.17%	0.00%	0.00%	0.17%	3.91%	0.00%
0.19%	0.19%	0.38%	0.00%	0.00%	0.00%	0.00%	0.19%	5.79%	0.00%
0.00%	0.76%	0.25%	0.00%	0.00%	0.00%	0.00%	0.10%	0.10%	0.00%
0.27%	0.54%	0.27%	0.00%	0.00%	0.00%	0.00%	0.54%	5.46%	0.00%
0.15%	0.75%	2.56%	0.00%	0.00%	0.00%	0.00%	0.30%	14.63%	0.00%
0.27%	0.27%	2.37%	0.27%	0.00%	0.00%	0.00%	0.00%	30.69%	0.00%
0.00%	1.91%	0.64%	0.16%	0.00%	0.00%	0.00%	0.16%	8.76%	0.16%
0.00%	3.07%	0.61%	0.00%	0.00%	0.00%	0.00%	0.20%	12.70%	0.00%
0.14%	2.25%	0.98%	0.00%	0.14%	0.00%	0.00%	0.42%	17.46%	1.26%
0.00%	2.61%	1.90%	0.00%	0.00%	0.00%	0.00%	0.23%	8.55%	0.00%
0.81%	2.16%	2.16%	0.27%	0.00%	0.00%	0.54%	0.27%	11.38%	1.08%
0.29%	2.33%	1.75%	0.00%	0.00%	0.00%	0.00%	0.58%	0.87%	0.00%
0.21%	2.82%	1.30%	0.00%	0.00%	0.00%	0.00%	0.21%	12.82%	0.43%
0.40%	0.82%	1.01%	0.00%	0.00%	0.00%	0.00%	0.00%	10.78%	0.00%
0.19%	1.57%	1.97%	0.00%	0.00%	0.00%	0.00%	0.19%	11.24%	0.00%
0.00%	2.50%	1.25%	0.00%	0.00%	0.00%	0.00%	0.31%	7.19%	0.00%
0.00%	1.59%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	4.79%	0.00%
0.00%	5.89%	1.08%	0.17%	0.00%	0.00%	0.00%	0.35%	9.29%	1.61%
0.00%	1.87%	1.58%	0.14%	0.00%	0.00%	0.14%	0.43%	10.35%	0.28%
0.15%	0.78%	1.10%	0.15%	0.15%	0.00%	0.00%	0.31%	2.84%	0.31%
0.00%	4.44%	3.86%	0.19%	0.00%	0.00%	0.00%	0.19%	14.47%	0.19%
0.00%	2.02%	2.31%	0.28%	0.00%	0.00%	0.00%	0.43%	15.65%	0.72%
0.00%	5.00%	2.26%	0.16%	0.16%	0.00%	0.00%	0.16%	15.00%	0.48%
0.64%	2.90%	1.29%	0.10%	0.00%	0.00%	0.10%	0.10%	10.80%	0.32%
0.00%	1.03%	0.51%	0.17%	0.00%	0.00%	0.00%	0.34%	2.75%	0.00%
0.18%	2.56%	1.10%	0.18%	0.00%	0.00%	0.00%	0.36%	8.06%	0.36%
0.18%	0.18%	2.56%	0.00%	0.00%	0.00%	0.00%	0.18%	11.37%	0.00%
0.00%	2.19%	1.25%	0.00%	0.00%	0.00%	0.00%	0.31%	4.70%	0.31%
0.00%	0.27%	1.52%	0.00%	0.00%	0.00%	0.00%	0.27%	2.08%	0.00%
0.00%	0.69%	0.23%	0.00%	0.00%	0.00%	0.00%	0.23%	0.69%	0.00%
0.32%	3.07%	1.29%	0.16%	0.00%	0.00%	0.00%	0.32%	7.60%	0.00%
0.00%	1.49%	0.85%	0.00%	0.00%	0.00%	0.00%	0.42%	4.28%	0.00%
0.00%	5.40%	6.35%	0.63%	0.00%	0.00%	0.00%	0.00%	9.69%	7.01%
0.00%	1.42%	0.47%	0.00%	0.23%	0.00%	0.00%	0.23%	2.37%	0.00%
0.00%	0.46%	3.70%	0.00%	0.00%	0.00%	0.00%	0.23%	23.37%	0.00%
0.00%	3.20%	1.72%	0.00%	0.00%	0.00%	0.00%	0.00%	22.23%	0.74%
0.00%	5.28%	4.75%	0.26%	0.00%	0.00%	0.00%	0.26%	8.97%	0.00%
0.31%	2.17%	2.33%	0.00%	0.00%	0.00%	0.00%	0.15%	24.07%	0.00%
0.19%	1.94%	0.58%	0.00%	0.19%	0.00%	0.00%	0.19%	20.77%	3.49%
0.00%	1.04%	1.04%	0.00%	0.00%	0.00%	0.00%	0.59%	7.46%	0.44%
0.10%	1.16%	1.16%	0.00%	0.23%	0.00%	0.00%	0.23%	0.10%	0.00%
0.00%	0.48%	0.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	2.71%	2.71%	0.00%	0.00%	0.00%	0.00%	0.81%	6.77%	0.00%
0.23%	1.40%	2.80%	0.00%	0.00%	0.00%	0.00%	0.23%	9.81%	0.23%
0.00%	3.03%	2.02%	0.00%	0.00%	0.00%	0.00%	0.10%	2.52%	0.00%
0.00%	1.41%	1.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.80%	0.00%
0.14%	0.42%	3.10%	0.28%	0.00%	0.00%	0.00%	0.28%	20.62%	0.00%
0.16%	1.64%	4.93%	0.00%	0.00%	0.00%	0.00%	0.00%	15.79%	0.98%

Arenisca	Pelitas	L.- Volc.	Fil-Piz.	V.Volc.	Ties Molido	Opac.	Total
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.62%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.52%	100.00%
0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.16%	100.00%
0.00%	0.00%	0.92%	0.00%	0.92%	0.00%	0.30%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.52%	100.00%
0.00%	0.00%	0.00%	0.00%	0.13%	0.00%	0.13%	100.00%
0.00%	0.00%	0.00%	0.00%	0.18%	0.73%	0.36%	100.00%
0.00%	0.00%	0.17%	0.00%	0.53%	0.00%	0.17%	100.00%
0.00%	0.00%	0.00%	0.00%	0.17%	0.00%	0.19%	100.00%
0.00%	0.00%	0.00%	0.00%	0.10%	0.10%	0.10%	100.00%
0.00%	0.00%	2.46%	0.00%	0.81%	0.00%	0.27%	100.00%
0.00%	0.00%	0.15%	0.00%	0.30%	0.00%	0.60%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	100.00%
0.00%	0.00%	0.16%	0.00%	0.32%	0.00%	0.32%	100.00%
0.00%	0.00%	0.20%	0.00%	0.00%	0.00%	0.20%	100.00%
0.28%	0.00%	0.00%	0.00%	0.14%	0.00%	0.14%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.71%	100.00%
0.00%	0.00%	1.08%	0.00%	0.00%	0.00%	1.35%	100.00%
0.00%	0.00%	0.58%	0.00%	0.00%	0.00%	1.46%	100.00%
0.00%	0.00%	0.21%	0.00%	0.00%	0.00%	0.86%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.20%	100.00%
0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.59%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.31%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.71%	100.00%
0.00%	0.00%	0.14%	0.00%	0.14%	0.00%	0.57%	100.00%
0.00%	0.00%	0.31%	0.00%	0.00%	0.00%	1.42%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.19%	100.00%
0.00%	0.00%	0.14%	0.00%	0.00%	0.00%	0.72%	100.00%
0.00%	0.00%	0.32%	0.00%	0.16%	0.00%	0.16%	100.00%
0.00%	0.00%	0.10%	0.00%	0.00%	0.00%	0.48%	100.00%
0.00%	0.00%	0.17%	0.00%	0.00%	0.00%	0.86%	100.00%
0.00%	0.00%	0.18%	0.00%	0.00%	0.00%	0.18%	100.00%
0.00%	0.00%	0.00%	0.00%	0.18%	0.00%	0.18%	100.00%
0.00%	0.00%	0.00%	0.00%	0.94%	0.00%	0.94%	100.00%
0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.83%	100.00%
0.00%	0.00%	0.46%	0.00%	0.92%	0.00%	0.92%	100.00%
0.00%	0.00%	0.00%	0.00%	0.16%	0.00%	0.64%	100.00%
0.00%	0.00%	0.21%	0.00%	0.21%	0.00%	1.07%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	100.00%
0.00%	0.00%	0.23%	0.00%	0.47%	0.00%	0.47%	100.00%
0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.23%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	100.00%
0.00%	0.00%	0.26%	0.00%	0.00%	0.00%	0.26%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	100.00%
0.00%	0.00%	0.58%	0.00%	0.19%	0.00%	0.19%	100.00%
0.15%	0.00%	0.89%	0.00%	1.04%	0.00%	0.59%	100.00%
0.00%	0.00%	0.23%	0.00%	0.46%	0.23%	0.23%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	100.00%
0.00%	0.00%	0.27%	0.00%	0.00%	0.00%	1.35%	100.00%
0.00%	0.00%	0.93%	0.00%	0.00%	0.00%	0.46%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	100.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	100.00%
0.00%	0.00%	0.14%	0.00%	0.14%	0.70%	0.14%	100.00%
0.00%	0.00%	0.16%	0.00%	0.00%	0.00%	0.16%	100.00%

Corte N°	Tipo	Matriz	Cavid.	Qz	Fk	Plag
Yu-300-7	Indio I	57.87%	5.59%	11.94%	0.96%	0.96%
471-1	Jarro ?? 471-1 Baño Blanco	68.90%	5.23%	7.30%	1.40%	0.30%

Micrcl.	Biot.	Musc.	Turm.	Granate	Af-Px	Lit. Gra.	Arenisca	Esquisto	Fil-Piz.	Lit. Vol	V.Volc.
0.00%	1.34%	0.57%	0.00%	0.00%	0.57%	13.68%	0.38%	4.23%	0.00%	0.38%	1.15%
0.77%	0.93%	1.09%	0.00%	0.00%	0.46%	3.10%	0.14%	9.01%	0.00%	0.46%	0.77%

Opac.	Gran Arc	M. organ.	Tiesto	Total
0.38%	0.00%	0.00%	0.00%	100.00%
0.14%	0.00%	0.00%	0.00%	100.00%