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## PVC Op 53 and 54 Excavation Report

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## Operations PVC 53 and 54

The contiguous Op. 53 and 54 encompass 15,000m<sup>2</sup> on a low, level terrace of the Rio Cacaupala in the southeast corner of the site of El Coyote (see Figure 1). Operation 53 covers about 7,350m<sup>2</sup>, extending 105m east from the access road that runs north-south through El Coyote and ending at a low descent to the Rio Cacaupala on the east. Operation 54 projects 100m north from Op. 53's east end, is bordered by the Rio Cacaupala on the east, and terminates on the north in a steep rise to the high terrace that supports the majority of El Coyote's architecture. The Southeast Group, sitting on a terrace intermediate in height between these two landforms, overlooks Op. 54 from the west and Op. 53 from the north (see Figure 1 at the end of this report). The Quebrada Seca, a seasonal tributary of the Rio Cacaupala, lies within 100m to the south while a shallower channel running east-west defines Op. 53's south margin.

When mapped in 2002, this low terrace was covered with concentrations of rocks embedded in ground surface and low rises with indistinct edges. Our attention was drawn to this part of the center when, in that year, some fragments of what looked like copper slag were recovered from its heavily overgrown surface. Limited test pitting in Op. 53 and 54, directed by G. Thorne and M. Kerley, during 2002 recovered copper processing detritus from archaeological contexts. Being completely unprepared to excavate any facilities that might have been involved in this industry, and with the field season nearing its end, we ceased investigations within Op. 53 and 54. The plan was to return and expand clearing within the area once we had a better sense of how to pursue such a study. We were fortunate that Dr. Aaron Shugar, an expert in archaeometallurgy, was able to join us on the project during the 2004 and 2013 field seasons when we resumed work in Op. 53 and 54. The 2004 research was directed by C. Novotny and L. Richardson while we (P. Urban and E. Schortman) provided overall supervision of the 2002 and 2004 studies and directed the 2013 investigations with guidance from A. Shugar.

There are four major categories of excavations that were undertaken within Op. 53 and 54. One focuses on the investigation of what appeared to be distinct structures. None of these closely resembled other buildings that were investigated at El Coyote or at other sites that we have studied in northwest Honduras. That said, in each case the remains we uncovered were the results of purposeful human actions. Some were clearly related to copper processing, especially Str. 371, 372, 373, 376, 407, and 413, all in Op. 53. Others were not so obviously tied to this industry. A second category of excavations was devoted to investigating sizable boulders that were found scattered around Op. 53 but especially within Op. 54. The cluster of four large stones that comprise Str. 407 turned out to have been part of a station where copper-bearing rocks were initially broken up in preparation for smelting. Excavations of other boulders visible on the surface were conducted to test whether they had been used in this way. Test pits measuring at least 1x1m comprise the third major type of excavations pursued in Op. 53 and 54. These excavations served different purposes: to test whether an artifact concentration noted on ground surface pointed to the former existence of an activity area (Subop. 53CL); in search of debris from copper working that might have been tossed south of known processing areas along Op. 53's south margin (Subop. 53CB, CE, CF, CG, CH, CJ, and CK); and at the base of what looked to have been a staircase leading up the steep slope from Op. 54 on the east to the Southeast Group (Subop. 54CR). Finally, 94 test pits measuring 0.5m on a side were excavated within a grid that encompassed Op. 53 and 54. These probes were dug primarily to collect soil samples the analyses of which allowed for a comparative study of differing levels of copper concentrations across the lower terrace. Such studies were designed to provide another line of evidence that would allow us to assess where and at what scales metallurgy was practiced within

the study area. The report is organized according to these excavation types, starting with summaries of those investigations conducted in numbered structures. In all, approximately 584m<sup>2</sup> was cleared in the course of this work. Some aspects of the research described here have appeared in the publications listed at the end of this report.

## Structure 365

Structure 365, located 25.5m north of Str. 368, was marked by a collection of rocks that was visible on ground surface. Digging here within Subop. 54CA during 2013 uncovered 37m<sup>2</sup>, excavations being pursued to a maximum depth of 1.14m below modern ground surface. The initial 1m-wide trench was dug for 9m running roughly north-south, subsequent clearing of architecture being conducted east of that excavation. One major building phase was identified in the course of this work.

### Time Spans

Time Span	Construction Phase	Units	Strata	Features	Date
1	-	-	S.6	-	
2	-	-	S.4, 5, 7	-	
3	-	-	-	F.1	TCL
4	-	-	-	F.2	
5	-	-	S.2, 3, 8	-	
6	Str. 365-1 <sup>st</sup>	U.1-12	-	F.3, 4	TCL
7	-	-	S.1	-	

### Time Span 1

The earliest activity identified within Subop, 54CA was the deposition of at least 0.26m of a soft-compacted, fine-textured, coffee- to yellow-brown clay that contains charcoal flecks but no artifacts (S.6; its base was not encountered). Stratum 6 runs fairly flat for the 1.6m it was observed running north-south in the northernmost segment of the initial trench. It does rise 0.19m across 1m from west-to-east as seen in that excavation's north face.

### Time Span 2

Stratum 6 was subsequently covered by as much as 0.78m of a very fine-textured dark to medium brown, greasy clay (S.5). Though not found throughout the portion of the layer that was revealed in the northern 1.6m of the initial trench, a dense concentration of medium to large rocks was embedded within S.5 as seen in that excavation's east wall. Some of these stones protruded into the upper 0.08m of underlying S.6. Stratum 4, a lens of brown sandy clay that contains numerous pebbles that are 2-3mm in size, overlies S.5 and projects 0.7m south from

the initial trench's north wall. This deposit is maximally 0.25m thick on the north and overrides and pinches out against S.5 on the south. Another lens (S .7), this one composed of reddish brown coarse-textured sand that contains many small rocks up to 0.03m on their longest dimension, was recorded extending 0.33m west from beneath S.5 in the trench's north face. Stratum 7 rests on S.6 and, like S.4 and 5, was apparently cut during the creation of F.1. None of these layers yielded cultural materials.

### Time Span 3

Feature 1 is a round-bottomed cut that was recorded in the initial trench's northwest corner. Its creation truncated S. 4, 5, and 7. This declivity is maximally 0.65m deep and measured at least 0.8m across (its west and north margins were not exposed). The pit's south and east edges are defined by near vertical drops to the base. Feature 1 was, when excavated, filled with a gray-brown coarse sand that includes small sub-rounded to sub-angular pebbles up to 0.01m in diameter. The only artifacts found in this area of Subop. 54CA, pottery sherds and obsidian and chert flakes, were found within F.1. It is unclear if this depression was created as a result of cultural or natural processes.

### Time Span 4

Probably soon after F.1 was filled in, its southern margin was cut to a depth of 0.26m to create F.2. Feature 2 measures 0.66m across north-south, has a rounded bottom, the sides stepping down towards the base in increments of 0.03m and 0.23m. This declivity extends 0.29m into the portion of S.5 adjoining F.1 and is filled with a medium brown, coarse sand that contains many small (0.01m or less in diameter) white flecks.

### Time Span 5

The next period is characterized by the deposition of 0.1-0.2m of a fine-textured, medium brown clay that is characterized by a dense concentration of poorly sorted, subangular to subrounded, stones that range up to 0.05m in diameter (S.3). Stratum 3 abuts the U.12 rock fill on the south, extending 1.5m north of those stones to the north excavation limit beyond which it likely continues. Stratum 3 rides over S.4 and 5 as well as F.1; it is not clearly represented in the west excavation wall where it is replaced by S.2. The latter is a fine textured, dark brown clay with very few inclusions. Feature 2 is also limited to the trench's west wall and is sealed by S.2. We estimate that about 0.15m of S.2 was laid down now. The situation on the trench's south margin is different. Here S.2 and 3 are replaced by a soft-compacted, very fine-textured, medium-brown clay that contains many poorly sorted subrounded stone inclusions that are up to 0.04m in diameter (S.8). Stratum 8 was identified extending 1m south of Str. 365-1<sup>st</sup> (U.2) over which distance it was minimally 0.35m thick (its base was not revealed in Subop. 54CA). No cultural materials were retrieved from any of these earth layers.

### Time Span 6

Structure 365-1<sup>st</sup> consists of an extensive stone surface (U.1) that is underlain, at least in its northwest quadrant, by densely packed medium to large cobbles that are set in a dark brown clay (U.12). Unit 12 was exposed for 2.7m south from Str. 365-1<sup>st</sup>'s north edge over which distance it was 0.68m thick. Most of what we can infer about this building lies east of the initial

trench. From what was found here, it looks as though what was glossed as a structure consists of at least two different buildings defined by low cobble walls that are 0.20-0.45m wide by no more than 0.2m tall and that were set on the U.1 surface. One of these entities (Str. 365-1stA) is comprised of U.4 and 5 which apparently defined the east and northeast sides of a casual construction. The east wall, U.4, runs at an orientation of roughly 11 degrees for 3.45m, its south end anchored on a sizable boulder (U.2) that covers 0.75m in diameter. On the north, U.4 joins with U.5, the latter projecting 2.4m from this intersection at an angle of ca. 302 degrees. There is no sign that other perimeter walls were ever part of this building and it may well have been left open in its remaining sides. A 0.28m-tall by 0.9m-wide wall (U.3) intersects U.4's interior at a point 1.5m south of its junction with U.5 and projects 1.8m west from that intersection at an alignment of 245 degrees (U.3's west end lies outside excavation limits). Given its width and length, U.3 might have been a bench or shelf that was shielded from view and the elements by the perishable walls that were likely set atop U.4 and 5. Two sizable rocks (F.3), each measuring 0.35 in diameter, are set west of U.4 at 0.5m apart in a northeast-southwest trending line 0.6-1.1m north of U.3.

Structure 365-1stB, 1.4m northeast of the U.4/5 junction, has a different form. Here a stone wall (U.6) was followed for 3.5m at an angle of 57 degrees. U.6 seems to terminate on the southwest without joining another construction. On the northeast the wall turns a right angle and runs for 0.75m, stopping 0.1m southeast of U.7. The latter wall is 1.5m long and oriented approximately 52 degrees. Unit 7 ends on the southwest and northeast without intersecting another construction. Lying 0.5m northeast of U.7 is another comparable wall, U.8, which was followed for 2.6m over which distance it was aligned ca. 50 degrees. It may be that U.6-8 were parts of a building (Str. 365-1stB), the 0.5m gap between U.7 and 8 comprising a door leading southeast into its interior. If so, we may have to stretch the concept of building a to encompass this construction. In fact, what U.6-8 look like is a series of baffles, stone foundations for perishable walls that served to seclude and shelter from the elements activities that took place southeast of these constructions. There is no evidence that the space north or south of these walls was further partitioned or enclosed.

Two rectangular blocks of stone that are flush with U.1 (U.9 and 10) lie outside Str. 306-1stA and 306-1stB. Unit 9 is 2.6m northwest of U.7's southwest end and covers 1.3 by 1.5m northwest-southeast (340 degrees). This construction is fronted on the southeast by two adjoining boulders, set 0.3m southeast of U.9, each stone measuring 0.3m (on the east) and 0.45m (on the west) across. The second block of stones (U.10) is 0.6m southeast of U.9's south corner, and encompasses 0.9m by 1.15m northwest-southeast (334 degrees). The construction's southwest perimeter is built around a boulder that measures 0.2x0.65m.

The final construction recognized as part of Str. 365-1<sup>st</sup> is a curved line of stones (U.11), set even with U.1, and located 0.2m northeast of U.5 and 0.3m southwest of U.10. Unit 11 is about 0.2m wide, covers 1.9m northwest-southeast, its concave face looking to the west/southwest. The deepest point on the arc is near its center and measures 0.35m southwest-northeast.

In general, Str. 365-1<sup>st</sup> consists of a stone surface atop which were seemingly raised several relatively insubstantial constructions that delimited and sheltered as many activity areas. Low, narrow walls (likely foundations for perishable upper constructions) define, but do not enclose, these spaces while blocks of stones set flush with the paved area may have marked specific activity loci within this expansive space that covered at least 37m<sup>2</sup>. The paucity of artifacts recovered from TS.2 contexts on Str. 365-1<sup>st</sup>, mostly pottery sherds and obsidian and chert flakes, makes it difficult to infer what those activities were.

### Time Span 7.

Following Str. 365-1<sup>st</sup>'s abandonment, 0.08-0.15m of a fine-textured, moderately soft-compacted, dark gray-brown humus horizon formed atop Str. 365-1<sup>st</sup> and S.2 and 8.

### **Structure 366**

Structure 366 appeared on ground surface to have been a 'U-shaped' construction, oriented northeast-southwest, open on the northeast, and bounded by substantial stone walls on the remaining sides. It did not appear as a platform but as a sizable surface-level building. Structure 379 is 47m to the northeast. Digging here in 2004 within Subop. 54AB and AC took the form of a 1m-wide by 27m-long trench that cut across the approximate center of the 'U' northwest-southeast. In all, 27m<sup>2</sup> were cleared here. Excavations, directed by C. Novotny, reached maximum depths of 0.6m and 0.38m below modern ground surface within and beyond construction, respectively. One building episode was identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.4	-	
2	Str. 366-1 <sup>st</sup>	-	-	F.1-10, 13-16, 18	TCL?
3	-	-	S.2, 3	F.11, 12, 17	
4	-	-	S.1	-	

### Time Span 1

The first event for which we have evidence is the deposition of at least 0.37m of a sandy, dark brown soil containing large quantities of gravel (S.4; its base was not found). Stratum 4 was only exposed over the eastern 4.2m of the trench where it underlies TS.2 construction.

### Time Span 2

Constructions pertaining to Str. 366-1<sup>st</sup> were difficult to ascertain, hence their designation here as 'features.' Though at various points we were ready to give this supposed edifice up as no more than a pile of stones (no fault of Novotny's careful work here), patterns were noted in the distribution and disposition of the rocks that led us to see it as a purposeful construction, albeit one we had not seen before. What follows is our attempt to make sense of the aforementioned patterns.

Structure 366-1<sup>st</sup> was built in what looks like a series of cobble-filled pens retained by walls of the same material, all of them set in a northwest-southeast line. One purpose of these constructions was to contain a broad declivity. The building's northwest limit is defined by what seems to have been a cobble wall (F.1) that stood 0.5m high and was 1.6m wide. A dense fill,

(F.6) composed of small to large cobbles set in a brown clay (F.6), backs F.1 and continues for 1.57m to the southeast where it is bordered by another substantial wall (F.2), this one covering 0.84m across and standing 0.5m high. Together F.1, 2, and 6 make up a block of solid rocks measuring 4.01m northwest-southeast, most of its component stones lying flat. Feature 13 abuts F.2 on the southeast, intersecting the latter at a point 0.18m below its top and sloping down 0.32m over 1.05m from northwest-to-southeast. This construction is made up of tightly packed small to medium-size cobbles and it defines the northwest side of a channel (F.7) the southeast flank being bordered by F.14. The latter closely resembles F.13, rising an observed 0.32m over 0.48m from northwest-to-southeast. Feature 14 terminates at a point 0.18m below the top of F.3 on the southeast; F.3 is a 0.34m-tall by 0.45m wide wall. Ultimately, the F.7 declivity measures 2.47m northwest-southeast at the top, is at least 0.32m deep (its base was not found), the lowest observed point in it measuring 1m across. Most of the cultural material retrieved from these excavations (20 chert and 10 obsidian flakes) was found within F.7

Extending 5.97m southeast of F.3 is another fill unit, this one made up primarily of small, and a few medium-size, rocks all set in a brown clay matrix (F.8). As was the case with F.6, the F.8 rocks were mostly observed to be lying flat. Feature 8 was bounded on the southeast by what appears to have been a 0.53m-wide wall (F.4). Feature 4 was at least 0.33m tall (its base was not definitively identified) and is bordered on the southeast by another fill unit characterized by densely packed small to medium-size cobbles set in a brown clay (F.9). Feature 9 extends 1.88m to the southeast where it ends at yet another wall (F.5), this one rising to a height of 0.47m and measuring 0.65m across. Feature 10, another fill unit composed of small to medium-size stones set in a brown clay, was traced for 1.27m to the southeast where it ends in F.15. This appears to have been another stone wall that was at least 0.33m high by 0.85m wide. What happens next on the southeast is unclear. Another possible wall (F.16), encompassing 0.3m high by 1.2m northwest-southeast, is 1.8m to the southeast of F. 15. There is no strong evidence that this gap was filled with stones as was the case to the northwest. A pit (F.18) dug 0.26m into S.4 was recorded extending 1m southeast of F.16. Feature 18's northwest side seems to have directly abutted F.16 while its southeast flank slopes up gradually, rising 0.26m across the pit's full width (1m) from northwest to southeast.

Overall, the complex of inferred constructions that make up Str. 366-1<sup>st</sup> spans 21.35m northwest-southeast, is largely solid stone, stood roughly 0.5m tall on its most completely exposed northwest flank, and contains a 2.47m-wide northwest-southeast by (minimally) 0.32m-deep pit within it and is bordered by a 0.26m-deep by 1m-wide depression on the southeast. The former feature is bordered by sloping constructions on its southeast and northwest margins. All of these constructions were made almost exclusive of river cobbles that range from pebbles to large examples (one of the biggest measures 0.69m across and is 0.31m thick). The stones are generally flat-laid in a brown clay and, in the cases of F.1-3, there are signs that care was taken to direct the flatter aspects of the rocks outward.

## Time Span 2

Soon after Str. 366-1<sup>st</sup> was abandoned, stones began to fall into the F.7 declivity (F.11) as they did into the F.18 pit (F.17). The F.11 rocks were primarily recorded on F.7's southeast flank (overlying F.14) where they were found consistently tilting down from southeast-to-northwest. Feature 11 is mostly found embedded within a soft-compacted, moderately fine-textured, brown clay (S.2) that fills up F.7 to a depth of at least 0.27m (the bases of F.7 and S.2 were not found). Stratum 2 was also recorded off Str. 366-1<sup>st</sup>'s northwest flank where it was at least 0.3m thick (its base was not identified). Feature 12, a layer of rocks, was concentrated within 0.75m of F.1.

These stones may well constitute fall from TS.2 architecture. A lens of small rocks embedded in a brown clay (S.3) was found within S.2, sloping down 0.18m over 0.75m from southeast-to-northeast at which point it disappears in the base of excavation. Stratum 3 begins 0.8m northwest of F.1 and 0.03m in the same direction from F.12. It may be that S.3 represents a northwest continuation of the late deterioration of Str. 366-1<sup>st</sup> represented by F.12.

### Time Span 1

Finally, a moderately soft-compacted, fine textured, very dark gray-brown humus (S.1) formed to a thickness of 0.07-0.2m on S.2 and covered all but the highest portions of Str. 366-1<sup>st</sup>.

### **Structure 368**

Structure 368 appeared on ground surface as a concentration of rocks with no appreciable elevation. It is 12m north/northeast of Str. 414 and 75m east of Str. 373 within Op. 53's northeast corner. Digging here during 2013 within Subop. 53CM uncovered 13m<sup>2</sup>, excavations reaching a maximum depth of 0.6m below modern ground surface. Three construction episodes were identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.2,3	-	
2	Str. 368-2 <sup>nd</sup>	U.1-4	-	-	TCL?
3	-	U.5	-	-	TCL?
4	Str. 368-1 <sup>st</sup>	U.6-8	-	F.2	TCL?
5	-	-	S.1	F.1	

### Time Span 1

The earliest activity attested to in Subop. 53CM is the laying down of two soil levels (S.2 and 3) to depths of at least 0.18m (their bases were not exposed). Stratum 2, best represented in the eastern half of the excavations, is a fine-textured, dark brown sandy clay that contains very few inclusions. At the same depth in the western portions of Subop. 53CM, S.2 is replaced by a dense deposit of tightly packed small rocks few of which exceeded 0.02m on their longest dimensions (S.3). These poorly sorted, subangular pebbles are set in a sandy soil, though there are more rocks than matrix in S.3. Together, S.2 and 3 define a relatively level surface. They appeared to be culturally sterile though so few artifacts were found anywhere in the Subop. 53CM excavations that S.2 and 3 do not stand out in this regard.

### Time Span 2

The earliest construction identified here (Str. 368-2nd) was bounded on the north, west, and south by stone walls that stood about 0.2m high (U.1-3). Structure 368-2nd measured 1.6m north south by at least 1.6m east-west (its east side was not exposed) and was aligned ca. 352 degrees. The exposed portion of the earthen surface was featureless. Remains of what appear to have been a 0.2m-tall stone wall (U.4) were recorded 1.7m west of U.2, Str. 368-2nd's western basal wall. Unit 4 was exposed for 0.5m running at an angle of very approximately 291 degrees, and was very casually constructed, being made from a mix of medium and (mostly) small rocks. Units 1-3, in contrast, seem to have been more formally put together with some care devoted to orienting the flatter sides of their rocks outward. All of the stones are set in a mud mortar.

Str. 368-2nd seems to have been a 0.2m-tall platform that covers at least 2.6m<sup>2</sup> and was oriented ca. 352 degrees. Unit 4 might have been part of a comparable construction though too little of it was uncovered to determine if this was the case. Structure 368-2nd's dimensions and general form resemble comparable constructions identified at Strs. 372-1<sup>st</sup> (U.1), 376-2<sup>nd</sup> (U.1), and 414-Sub1 and -Sub2. In the first two cases, the low eminences were clearly associated with copper working while the same case cannot be made for the last two constructions. The general paucity of any cultural materials associated with Str. 368-2nd makes it difficult to determine the building's function. Unlikely to have been a residence, Str. 368-2<sup>nd</sup> was likely a raised activity area though what took place on its featureless summit is uncertain.

### Time Span 3

During this interval the exposed portions of Str. 368 were covered with a layer composed of medium to small cobbles (U.5). About 0.6m north of U.4 these rocks were replaced with a fine-textured orange-brown clay (included in U.5) that is distinct from S.2 and 3. Unit 5's introduction had the effect of burying U.1-4 and creating a continuous surface that encompassed at least 13m<sup>2</sup>. A similar process was chronicled near the end of Str. 414's use-life where multiple small constructions were submerged beneath a level of stones.

### Time Span 4

Several constructions, all designated as Str. 368-1<sup>st</sup>, were raised atop the U.5 fill. These do not seem to have been parts of one edifice. Instead they appear to be free-standing constructions. Unit 6 is one of these entities. It is a rectangular stone block that covers 0.7-0.95m by 1.2m and stands about 0.2m high. Unit 6 is oriented ca. 330 degrees, widening from northwest-to-southeast. This construction rides over the central portion of Str. 368-2<sup>nd</sup>'s U.2. Located 0.5m to the southwest, U.7 is another block of stone, this one triangular in shape and 0.2m tall. Its sides measure 1m, 0.9m, and 1.2m long on the northeast, southwest and southeast, respectively, its southwest flank being aligned roughly 69 degrees. At 0.7 and 1.7m north of U.6 and 7 is a 0.6m-wide by 0.2m-high wall (U.8) that runs for 3.7m at an orientation of approximately 91 degrees. Unit 8 abuts a boulder (F.2) on the east, that rock encompassing 0.8x0.9m. How these different constructions fit together is unclear. It looks as though the perishable wall raised atop U.8 might have served as a baffle or screen for activities pursued on and around U.6 and 7 to the south.

The constructions raised now were made primarily of cobbles the flatter faces of which were directed outwards. Care seems to have been especially taken to direct the flatter faces of the U.6 and 7 rocks to the exterior. All of the stones were set in a mud mortar.

Only a scattering of artifacts, five pieces of chert and one pottery fragment, were found associated with this final version of Str. 368.

### Time Span 5

Following its abandonment, a dark gray-brown humus horizon (S.1) that is at least 0.1m thick formed atop Str. 368-1<sup>st</sup>. Some rocks were found in S.1 that had been disturbed from their original positions (F.1). Given the proximity of modern ground surface to the U.5 fill it was often hard to distinguish F.1 from U.5. In general, it appeared that Str. 368 had suffered relatively little disruption prior to its excavation in 2013.

### **Structure 369**

Structure 369 is located on level terrain 15m southwest of Str. 366 and 7m west-northwest of Str. 368. It appeared on ground surface that this building was joined by a low construction, or 'saddle,' to Str. 370, 2.5m to the north. Digging here in 2004 under C. Novotny's direction took the form of a 1m by 7m-long east-west trench (54AD) that was cut across the building. Excavations reached a maximum depth of 0.38m below modern ground surface in the course of which one possible building phase was inferred.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.2	-	
2	Str. 369-1 <sup>st</sup>	U.1	-	-	TCL?
3	-	-	S.1	F.1	

### Time Span 1

The earliest activity attested to in Subop. 54AD was the laying down of at least 0.21m of a softly compacted, fine-textured, dark gray to black greasy clay (S.2; its base was not encountered). Stratum 2 contains a few rocks, those found near the S.1/2 interface (F.1) possibly having fallen from Str. 369-1<sup>st</sup> and settled into the upper part of the underlying S.2. Artifacts (ceramics, chert flakes, some poorly preserved non-human bone) retrieved from the lowest exposed 0.12m of S.2 indicate a human presence in the area while this soil was accumulating.

### Time Span 2

Structure 369-1<sup>st</sup> seems to have been a block of stone that stood ca. 0.2m tall and measured 5.1m east-west (its lines were not sufficiently clear to determine the building's orientation). There was no sign of a superstructure though the summit was surfaced with rocks, mostly river cobbles. These rounded rocks comprise the majority of the stones used to make Str. 369-1<sup>st</sup>, all the rocks being set in a mud mortar. There was no obvious effort devoted to finding cobbles with flat aspects to provide an outer facing for Str. 369-1<sup>st</sup>'s east and west sides. Only 1 chert flake was recovered from Str. 369-1<sup>st</sup> and the construction's purpose is not known.

### Time Span 3

Following Str. 369-1<sup>st</sup>'s abandonment, a softly compacted, fine-textured, dark brown humus (S.1) formed atop S.2 and covered most of the building. Stratum 2 is darker in hue than S.1, a situation that reverses the usual pattern seen elsewhere in Op. 53, 54, and at El Coyote in general where the humus horizon is darker than the underlying soil. A few rocks (F.1) that likely tumbled from TS.2 architecture were noted in S.1, extending down into S.2. The general paucity of the F.1 stones suggests that Str. 369-1<sup>st</sup> was never much taller than it was when excavated.

### **Structure 371**

Structure 371 appeared on the surface as an extensive, low (ca. 0.35m high) construction located 10m east of Str. 372 and 55m southeast of Str. 373. Two 1x1m test pits dug here by F. Thorne in 2002 (Subop. 53C) revealed debris, including slag, associated with copper processing but left open the question of whether Str. 371 was actually a building. Excavations conducted within Subop. 53BD, BE, BK, and BM by C. Novotny during 2004 set out to answer that question. A total of 11m<sup>2</sup> was cleared in the course of this work, excavations reaching a maximum depth of 0.75m below modern ground surface. No architecture was encountered in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3, 4	-	TCL?
2	-	-	-	F.1	TCL
3	-	-	S.2	-	TCL
4	-	-	S.1	-	

### Time Span 1

The earliest activity attested to in these investigations was the deposition of at least 0.18m of a fine-textured, red-brown clay with few inclusions (S.4; its base lies beyond excavation limits). Capping S.4 by 0.11-0.21m is a softly compacted, dark red-brown clay (S.3). Both levels were observed to ascend from east-to-west, S.4 rising 0.1m across 0.87m and S.3 0.2m over 1.6m in that direction. The recovery of a few artifacts, including a piece of slag, from these levels points to the conduct of human activity, possibly involving copper working, in the immediate area during TS.1

### Time Span 2

A large rock (F.1) was recorded partly embedded in S.3 and 4. Feature 1 measures 0.9m east-west by 0.5m thick, was found lying horizontally, and projects 0.24m down into S.4 and

was covered by 0.11-0.2m of S.3. Fully 0.14-0.21m of F.1 would have been visible above the ground surface formed by the top of S.3. There were few other rocks in F.1's vicinity and it is unclear whether it arrived at its find spot by means of human intervention or natural processes. The boulder's seeming isolation and the rarity of rocks this size in Op.53 tentatively points to the former interpretation. What activities might have occurred on and around F.1 are not clear though a great many pieces of copper slag and ceramic furnaces were clustered around it (167 pieces/0.6m<sup>3</sup>). It may be that F.1's relatively flat top served as a base on which copper was smelted in ceramic furnaces.

### Time Span 3

Stratum 3 was now blanketed by 0.04-0.21m of a hard-compacted, dark brown clay that contains few inclusions (S.2). Stratum 2 just covered the top of F.1., rising 0.14m over 1.4m from east-to-west, paralleling the ascents noted for underlying S.3 and 4.

### Time Span 4

A loosely compacted, dark gray-brown humus (S.1) now formed to a thickness of 0.03-0.38m atop S.2. Materials pertaining to copper working, including pieces of slag and ceramic furnaces, were recovered in significant numbers from S.1.

### Summary

In general, it appears that what we identified as Str. 371 was an area across which the detritus of copper working, including pieces of slag, ceramic furnaces, and copper ore, was tossed. Most of that debris was found within S.1 and 2. There was no evidence for constructions that might have restricted the flow of these materials, such as the pit (U.4) into which similar debris was thrown at Str. 373. Prior to its use as a handy place to jettison trash, F.1 might have served as a support for furnaces used in smelting copper, replicating on a small scale what is more clearly attested to at Strs. 372-1<sup>st</sup> and 376-2<sup>nd</sup>.

### **Structure 372**

Structure 372 is located 14.2m south of Str. 407 and 35m southeast of Str. 373 in the southwest corner of Op. 53. The building was primarily identified by the presence of several large pieces of columnar basalt that were found protruding above ground surface. As rocks of this sort were rarely attested to at El Coyote or elsewhere in the lower Cacaupapa valley, we thought that their presence here might signal a construction of a sort that had not been documented as of 2004 when excavations were conducted at this locale. Digging within Subop. 53AO, AP, AU, AW, AX, AZ, BC, BF, BH, BI, BL, BP, BR, BS, BO, and BY, directed by L. Richardson, uncovered 32m<sup>2</sup>, excavations reaching a maximum depth of 0.42m below modern ground surface. One major, albeit extensive, construction stage was identified in the course of this work.

### Time Spans

Time Span	Construction Phase	Units	Strata	Features	Date
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1	-	-	S.3-5	-	
2	Str. 372-1 <sup>st</sup>	U.1-3	-	F.1-5	TCL
3	-	-	S.1, 2	-	

### Time Span 1

The earliest event chronicled in the investigation of Str. 372-1<sup>st</sup> was the deposition of at least 0.17m of a fine-textured, loosely compacted, gray-brown soil (S.4). Stratum 4 was only exposed over a limited area (0.2m north-south) in the far southern portion of Subop. 53AP.

A fine-textured, loosely compacted, dark brown soil that contains numerous pebbles (S.3) covers S.4 by 0.04m. Stratum 3 was identified extending 0.2m south and 0.29m north of U.3; in the latter direction it runs between U.2 and 3. A very similar earth, S.5, reappears 1.96m north of U.2. The main difference between S.4 and 5 is that the latter's hue is a medium brown. Based on these three, discontinuous, short exposures of S.3 and 5 it appears that they constitute the same depositional unit which runs flat over 4.83m north-south. It was on and into S.3-5 that Str. 372-1<sup>st</sup> was built.

### Time Span 2

Structure 372-1<sup>st</sup> consists of three major elements spread out over 7.72m north-south. The northernmost element is a 0.1m-tall, stone-faced and -surfaced platform (U.1) that covers 1.52m north-south by at least 1.8m east-west (its east edge was not clearly identified). Unit 1 is aligned roughly 283 degrees and was made from a mix of river cobbles and masonry blocks. Shaped or not, the rocks were oriented with their flatter faces directed outward and are set in a mud mortar. Fragments of ceramic furnaces and slag were found scattered across U.1's summit.

Located 0.09m south of U.1, a ceramic furnace (F.1) was found *in situ* sitting on 0.15m of small rocks that were apparently used to stabilize the furnace where it rested on ancient ground surface (all included in F.1). The furnace itself stood 0.3m high, measured on its exterior 0.35mx0.35m while its interior encompassed 0.27m on a side. The furnace's walls are 0.04-0.08m thick and made of poor refractory adobe. The walls were vitrified by high heat on their interiors, while the finished exterior margins are unbaked and eroded. The dense vitrified clay, which blends into the slag, shows that the mass flowed downward to the south, based on the location and orientation of trapped bubbles. The furnace's south side had been broken away to allow the molten ore to collect in a shallow tapping pit (F.2) set in the ground immediately below it. This pit measures 0.54m long north-south by 0.09m deep. The earth underlying the pit (F.4) was burned red to a depth of 0.14m while F.2's south wall was similarly transformed to a thickness of 0.12m north-south (all included in F.4). Feature 4 also contained fragments of slag and metallic copper. Pieces of slag and metallic copper were also found in F.2, especially on the pit's north edge bordering and underlying the furnace for 0.08m (F.3). Feature 3 is characterized by a metallic gray (2.5Y 4/1) soil that encompasses 0.15m north-south.

Lying 2.16m south of F.2 is the line of long, thin pieces of columnar basalt (U.2). The largest, presumably intact, segment is roughly 0.8m long, while the smallest piece, probably a fragment, is about 0.2m in length. Unit 2 runs for 3.6m at an orientation of, very roughly, 104 degrees and is one stone high (0.22m) and wide (0.24-0.32m). An additional piece of columnar basalt measuring 1.12m long lies 1.1m northeast of U.2's east end and is oriented ca. 71 degrees. Given this stone's similarity with the rocks comprising U.2, it may have been part of that

construction from which it was dislodged. Alternatively, this isolated stone could be part of U.2, marking a change in that construction's direction. Flat-laid rocks project 0.16m south out from under the basalt. Included in U.2, these stones may have served to stabilize the basalt line.

Located 0.38m south of U.2 and 4.58m south of U.1 is a stone surface (U.3) that covers 4.06m east-west by 1.53m to 1.65m north-south and is aligned ca. 284 degrees. Unit 3 tilts down slightly from west-to-east and is paved primarily with light-colored stones; roughly 40% tuff, 30% limestone, and 30% cobbles of undetermined materials. The floor is delimited along parts of its perimeter by tall, relatively thin stone slabs set erect with their long axes running up-and-down. These upright rocks are 0.1-0.25m distant from the pavement. When uncovered, the slabs were tilting out and away from the stone floor they bordered; when erect they would have risen 0.2-0.25m above the U.3 surface. Several pavement stones on the western side of the surface bear clear circular depressions measuring ca. 0.1m across. These appear to have been caused by repeated striking of their surfaces, probably using an implement like the ground stone pounding tool found directly atop the floor. The U.3 floor is capped over much of its extent by a 0.03-0.11m-thick layer of small slag fragments set in a loosely compacted, fine-textured, soil that has been stained a dark gray-brown (10YR 4/2) from the included slag fragments (F.5). Feature 5 did not apparently escape the limits of U.3 and its bordering vertical slabs.

Structure 372-1st, in general, was less a single building than a set of three work stations all devoted to the smelting and processing of copper. Unit 1, in this scenario, would have served as a slightly elevated surface for those working the furnaces that bordered that platform on the south and in which copper-rich ores were smelted. Once sufficiently high temperatures were reached, the furnaces' south sides were broken and the molten material flowed into the shallow tapping pit located immediate to the south. Now cooled, the smelted material was taken to the U.3 floor where it was pounded using a stone mallet to free the small pieces, or 'prills,' of copper contained within the slag. It may be that water from the nearby Quebrada Seca was directed over U.3 to wash away the dross and leave the copper prills to be collected. If so, the west-to-east drop in the U.3 floor suggests that the water traveled in this direction. The U.2 rocks might have then served to direct the water, or at least keep it from inundating the smelting area to the north. The vertical slabs that partially delimit the U.3 pavement may also have helped control the direction of any water coursing over the U.3 stone floor.

### Time Span 3

Following Str. 372-1st's abandonment, a fine-textured, moderately hard-compacted, medium brown soil (S.2) accumulated to a thickness of 0.15m (its base was not uncovered). Where S.2 overlies F.2 (the tapping pit) it takes on a grayer hue (10YR 3/8 as versus 10YR5/3 in other parts of the stratum). This discolored portion of S.2 is found only where the soil directly overlies F.2 and is 0.07-0.12m thick. A loosely compacted, fine-textured, very dark brown humus horizon subsequently formed to a thickness of 0.06-0.11m thick atop S.2.

### **Structure 373**

Structure 373 is 40m northwest of Str. 376 immediately east of the dirt road that runs northeast through the approximate center of the Southeast Group. What we designated as Str. 373 appeared on the surface to be a 0.3m-tall rise that covered 3.5m northwest-southeast by 4.5m the edges of which were indistinct. Excavations here in Subop. 53AB and AD during 2004 comprised one trench, 9.05m long by 1m wide, that was dug north-south across Str. 373's approximate center. Suboperation 53AG was then excavated that field season perpendicular to

Subop. 53AB/AD, extending 4m to the west from near the building's center. Suboperation 53AG is 1m wide north-south. Together, these initial investigations revealed one of the few instances of superimposed occupations in Op. 53 and 54, the sequence ending with the deposition of large numbers of broken ceramic furnaces and other debris from copper processing in a prepared pit (U.4). Subsequent investigations, conducted within Subop. 53CA in 2013, clarified the number and nature of these occupation levels. In all, 31m<sup>2</sup> were cleared here in the course of this work which was overseen by C. Novotny in 2004. Digging reached a maximum depth of 1.1m below modern ground surface, revealing four major occupation phases.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.8, 10	-	-
2	-	-	S.5-7	-	-
3	Str. 373-Sub4	U.1, 2	-	F.4, 5	TCL
4	-	-	S.4	-	TCL
5	Str. 373-Sub3	U.3	-	F.2, 3	TCL
6	-	-	S.2, 4, 9	-	TCL
7	Str. 373-Sub2	U.4	-	-	TCL
8	Str. 373-Sub1	U.5, 6	-	-	HIST?
9	-	-	S.1, 3	-	-

### Time Span 1

The earliest activity attested to in these investigations was the deposition of at least 0.17m of a light brown, fine-textured clay (S.8; its base was not encountered). Embedded in this clay are river-rounded rocks that range from pebbles to boulders. The stones pick up in density with increasing depth and appear to have been introduced during a period of significant flooding from the nearby Rio Cacaupala and its seasonal tributaries. No artifacts were retrieved from S.8. Stratum 10 occupies the same stratigraphic position as S.8 and also incorporates rocks. What distinguishes the former soil is its darker brown hue and its small white, black, and orange inclusions. Stratum 10 was recorded east of Str. 373 whereas S.8 was found under Str. 373-Sub2. Most likely these are parts of the same stratum that are distinguished by their slightly different depositional histories.

### Time Span 2

During this interval, S.8 was blanketed by 0.15-0.29m of a dark gray-brown clay that contains some sand (S.6). In most of the investigated areas, S.6 was subsequently covered by 0.1-0.24m of a very similar earth distinguished by the inclusion of more sand within it (S.5). Immediately west of Str. 373, S.5 is replaced by a gray clay that contains sizable quantities of sand and gravel along with angular chunks of small white rocks (S.7). Stratum 7 is 0.09-0.15m thick and rests directly atop S.6. Strata 5, 6, and 7 are probably parts of the same depositional unit, their distinctions resulting from slight differences in the conditions under which they were laid down. The recovery of artifacts from these layers points to a human presence in the immediate area while they were accumulating.

### Time Span 3

The earliest construction identified in the area of Str. 373 consists of two stone lines (U.1 and 2) that meet to form the northeast corner of Str. 373-Sub4. Unit 1, the east wall, stands 0.2m tall and measures 0.92m north-south. Unit 1 narrows from its maximum girth of 0.4m on the north to 0.25m across at its south end. Unit 2, in turn, is also 0.2m high and was traced for 0.55m to the west at which point it left our excavations. As no sign of this construction was revealed 0.5m to the west in the north-south-running trench (Subop. 53AB/AD) that was dug through Str. 373's center in 2004, it is unlikely that U.2 was ever much longer.

It may well be, therefore, that Str. 373-Sub4 was an 'L-shaped' construction that was open on the west and south, encompassed 0.92m north-south by at least 0.55m east-west, its interior covering 0.5m north-south by at least 0.35m. Several fragments of ceramic furnaces of the type used to smelt copper were found within the space defined by U.1 and 2. There was no sign of burning in or near this construction. Structure 373-Sub4 was aligned roughly 353 degrees and was built primarily of river cobbles the flatter aspects of which were directed outwards. The one major exception to this pattern is the large, white (possibly limestone) faced block that formed the construction's northeast exterior corner. That rock measures 0.32m long by 0.32m wide by 0.18m thick and was carefully placed so that its two shaped faces looked out to the east and north. All of the rocks are set in a mud mortar. Rocks found tipping down and away from U.2 on the north look to have fallen from that wall (F.5). Feature 5 was traced for 0.30m north of U.2 and suggest that Str. 373-Sub1 was left untended for a significant period after it was abandoned and before it was covered by S.4 during TS.4.

During 2004, a 0.02-0.04m-thick layer composed of densely packed crushed white rocks (F.4) was identified within Subop. 53AB/AD. Feature 4 was traced for 5.05m south from the trench's north margin over which distance it was relatively flat (the layer's north edge was not uncovered). Originally identified as a floor, no sign of F.4 emerged during the 2013 investigations located immediately east of the original exposure. Feature 4 does rest at the same depth as the base of U.1 and 2. It, therefore, remains possible that it was part of a formalized surface associated with the use of Str. 373-Sub4, that surface possibly being highly restricted in its extent (probes dug west of Subop. 53AB/AD did not encounter F.4).

### Time Span 4

It was at this time that Str. 373-Sub4 was covered by 0.12m of a hard-compacted, brown, silty clay (S.4). As S.4 would continue to accumulate during TS6, the 0.12m figure is an estimate based on the amount of this earth that would have to be in place to support the constructions and features dating to TS.5. We could not determine if this slice of S.4 was introduced purposefully to seal Str. 373-Sub4 or accumulated naturally.

### Time Span 5

Structure 373-Sub3 consists of a stone floor and what seem to be two localized piles of debris that were apparently associated with its use. The floor (U.3) is set atop the lower segment of S.4 and is composed primarily of tightly packed small stones set in a very hard-packed earth. Unit 3 is 0.1-0.15m thick, its margins defining an irregular course with no formalized edges. Overall, U.3 encompasses roughly 16m<sup>2</sup>; its western border was not uncovered. Unit 3 does not extend over Str. 373-Sub4. Resting on the floor was at least one piece of a ceramic furnace while an iron-rich rock of the type commonly associated with copper working at El Coyote was embedded in this surface.

Located 1m south of U.3, and at the same level, is a tight concentration of five rocks and two ceramic furnace fragments that together encompass 0.4m in diameter (F.3). At 0.65m directly west of F.3 is a collection of seven furnace pieces (F.2) arranged to form a semi-circle open to the northwest and measuring 0.35m across its opening in this direction. The arc created by this arrangement is maximally 0.2m deep northwest-southeast. As with F.3, F.2 is at the same elevation as U.3, lying 0.25m south of a southern extension of the surface. There was no evidence of burning in the areas of F.2 and 3. The behavioral significance of these entities remains unclear.

Overall, it appears that Str. 373-Sub3 was a work area part of which was formalized by the laying down of a stone floor. That floor covered at least 16m<sup>2</sup> while the locus of which it was a part encompassed, minimally, 23m<sup>2</sup>. The activities pursued here involved the use of ceramic furnaces of the type employed in smelting copper elsewhere in Op. 53 (see especially Str. 372-1st and 376-2nd). There were no signs of burning within the investigated portions of the work area though the area covered by the U.3 floor seems to have been subject to repeated use sufficient to tamp down the soil in which the stones comprising the surface were embedded. The dirt bordering the floor did not evince comparable signs of use.

### Time Span 6

Unit 3 was covered now by approximately 0.22m of slightly different soils. As much as 0.15m of S.4 accumulated, completely covering U.3 and F.2 and 3. A lens composed of a very similar earth (S.2) was recorded overlying S.4 within Subop. 53AB/AD. Stratum 2 is distinguished by its being more softly compacted than was S.4 and the greater quantity of pebbles scattered throughout it. This deposit is maximally 0.17m thick and pinches out between the underlying S.4 and overlying S.1 at a point 1.3m south of Subop. 53AB/AD's north excavation wall. A light brown, hard-compacted, fine-textured earth with many small white inclusions (S.9) was also recorded overlying S.4 and above U.3. This layer covers S.4 by 0.15m. In general, it is quite possible that the slight variations in color and inclusions in S.2, 4, and 9 simply represent slight differences within the same depositional unit portions of which accumulated under slightly different conditions.

### Time Span 7

Structure 373-Sub2 consists of a pit (U.4) measuring 6m in diameter that was dug 0.43-0.48m through S. 2, 4, and 9. The declivity's north and south edges are nearly vertical while its west margin slopes gradually and continuously down 0.28m over 0.8m from west-to-east. Unit 4 is filled with a great quantity of debris resulting from copper processing. The majority of the

material recovered here consists of broken ceramic furnaces and slag packed tightly together. Unit 4 covers all but the northernmost 1.7m of the exposed portion of Str. 373-Sub3.

### Time Span 8

The last identified construction exposed in this sequence (Str. 373-Sub1) is composed of two parallel stone walls (U.5 and 6) that were built against and over U.4. They measure 0.2m high by 0.3m wide, were traced for 2m (U.5 on the east) and 2.7m (U.6 on the west) north from the center of the furnace deposit, and are oriented ca. 7 degrees. The distance between them is 1.5m, that intervening area being surfaced with dirt. The result was the creation of a rectangular figure that measures 2.1m east-west by 2.7m north-south, was open on the north, and contains an interior space that encompasses 4m<sup>2</sup>. No other constructions were found in association with Str. 373-Sub1 and there is no evidence that it was associated with copper working.

Units 5 and 6 were made primarily of river cobbles mix with a few angular rocks. While the stones comprising U.5 were laid flat a great many of those in U.6, the western wall, were placed on end. All of the rocks are set in a mud mortar.

### Time Span 9

Following Str. 373-Sub1's abandonment, a 0.1-0.3m-thick, fine-textured, dark gray-brown humus horizon formed atop S.2 and 4. The upper parts of U.5-6 project into S.1 and were visible on ground surface. Stratum 1 was also not identified over the uppermost sections of U.4, the humus not forming where the copper processing detritus approached modern ground surface. A lens of dark gray-brown soil that contains numerous small fragments of ceramic furnaces, quartz, and other angular rocks (S.3) was recorded atop U.4's upper southern flank. Stratum 3 has a maximum thickness of 0.18m, extends 1.32m north-south, and pinches out on the south above, and 0.5m south of U.4's, south edge. Stratum 3 takes the place of S.1 in this area, its behavioral significance remaining unclear. It looks like it may have resulted from some localized disturbance of U.4 though there were no obvious signs of such a dislocation.

### **Structure 376**

Structure 376 lies 4.5m north/northwest from Str. 372. Excavations conducted within Subop. 53AL, AQ, AR, AT, AY, BG, BV, and BW under the direction of C. Novotny during the 2004 field season uncovered 20m<sup>2</sup>, digging reaching a maximum depth of 0.52m below modern ground surface. Two major occupation periods were identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.2, 3	-	TCL
2	Str. 376-2 <sup>nd</sup>	U.1	-	-	TCL
3	-	-	S.2	-	

4	Str. 376-1 <sup>st</sup>	U.2	-	-	Historic
5	-	-	S.1	-	

### Time Span 1

The first event that is clearly attested to in these investigations was the laying down of 0.07-0.15m of a hard-compacted, moderately fine-textured, gray-brown soil (S.3). Stratum 3 was relatively level over the 3.8m it was observed running north-south. This layer was subsequently blanketed by roughly 0.1m of a moderately hard-packed, very fine-textured gray-brown earth that contains numerous, though not densely packed, small rocks (S.2). As S.2 resumed accumulating during TS.3, we are hard put to specify how much of it was deposited now. The figure offered here is an estimate based on how much of this earth would need to have been in place to support Str. 376-2<sup>nd</sup>.

Unfortunately, deposits associated with Str. 376 had been disturbed prior to excavations to the point where we cannot be certain what cultural materials might have been originally associated with these relatively early layers. The construction and use of U.2 in the fairly recent past (within the last several centuries) probably had a good deal to do with the observed dislocations.

### Time Span 2

Structure 376-2<sup>nd</sup> is a stone-faced and -surfaced platform (U.1) that stood 0.24m high, measured 0.75-0.9m wide north-south by an estimated 2.3m east-west, and was aligned 273-282 degrees. Unit 1 was fashioned primarily of river cobbles mixed with a few faced blocks, all set in a mud mortar. A broken ceramic furnace was found atop the small platform while a pounding stone, similar to that recovered from the Structure 372-1<sup>st</sup>'s U.3, and stone hammer were retrieved off the building's north edge. It appears, therefore, that the Structure 376 platform supported smelting furnaces and that slag was pulverized nearby, perhaps on nearby Str. 372-1<sup>st</sup>'s U.3.

### Time Span 3

Following Str. 376-2<sup>nd</sup>'s abandonment, an additional 0.06-0.1m of S.2 was deposited. Stratum 2 was observed running more-or-less flat for 2.24m south of U.1 of which it covered all but the uppermost 0.1m on that side. North of U.1, S. 2 drops 0.08m across 1.1m from south-to-north. The earth layer also seems to have contained more rocks, mostly small to medium-size cobbles, north of Str. 376-2<sup>nd</sup> than south of that construction. It may be that these rocks tumbled from their original positions atop the platform.

### Time Span 4

Raised atop S.2 is an oval stone surface (Str. 376-1<sup>st</sup>, U.2) that is 1.22m south of U.1. Unit 2 encompasses (maximally) 1.1m by 0.9 m, its long axis running north-south, and is one stone, or 0.08m, thick. It was built from river cobbles that were set in a mud mortar. Structure 376-1<sup>st</sup> postdates U.1 as its base is 0.1m below the latter's top. The recovery in U.2's vicinity of artifacts, including shards of glass, that likely date to the late 19<sup>th</sup> century at the earliest indicate that Str.

376-2<sup>nd</sup> dates to this late interval. There were no signs of copper working found on and around U.2 nor could we determine what purpose this pavement served.

### Time Span 5

It was during this period that a fine-textured, loosely compacted, dark gray brown humus horizon (S.1) formed atop S.2. Stratum 1 eventually enveloped Str. 376-1<sup>st</sup>, covering it by 0.01-0.04m.

### **Structure 378**

Structure 378 is located on the west margin of Op. 53, immediately east of the dirt road that travels north-south through the site of El Coyote, eventually crossing the Quebrada Seca immediately to the south. The ground here ascends 0.37-0.45m over 3.2-3.6m east-to-west. Identified on the surface as a cobble line running north-south, this construction was investigated by digging Subop. 53AH, AI, AJ, AK, and BU across and along the visible architecture during the 2004 field season. In all, 32m<sup>2</sup> was eventually cleared in the course of uncovering two roughly parallel wall lines. Excavations reached a maximum depth of 0.3m below modern ground surface. One building phase was identified in the course of this work which was directed by C. Novotny.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.2	-	
2	Str. 378-1 <sup>st</sup>	U.1, 2	-	-	Hist.
3	-	-	S.1	-	

### Time Span 1

The first event identified in the environs of Str. 378 was the deposition of at least 0.17m of a light brown clay with small white inclusions (S.2; its base was not encountered). Stratum 2 was observed to rise 0.12m over 0.44m from east-to-west.

### Time Span 2

Unit 1, the western of the two walls uncovered here, rises 0.14-0.25m above S.2, is 0.6-0.69m wide east-west, and runs for 36m at an azimuth of 359 to 6 degrees. Lying 1.3-1.9m to the east, a comparable wall was traced for 11m at an angle of ca. 352 degrees. Both constructions were fashioned primarily of river cobbles that were set in a mud mortar. Little effort was devoted to finding rocks with flat faces to include in the walls or to orient those with flat aspects outwards. Units 1 and 2 are associated with artifacts that place them in the Historic era, most likely the late 19<sup>th</sup> to early 20<sup>th</sup> century. It may be that U.1 and 2 bordered an earlier version of the existing access road.

### Time Span 3

The final event identified in these investigations was the formation of a moderately soft-compacted, fine textured, dark gray-brown humus (S.1) to a thickness of 0.03-0.15m over S.2. Stratum 1 covers all but the uppermost portions of U.1 and 2.

### **Structure 379**

Structure 379 appeared on ground surface to be a low (no more than 0.6m tall) platform the margins of which were indistinct. The building is 3.25m south of the large boulder cleared in Subop. 54CB in Op. 54, about 50m southwest of Str. 411, and 70m northeast of Str. 414. Digging within Subop. 54CC, CD, and CE during 2013 revealed three distinct part of the building, each of which was oriented differently. On the supposition that what we took to be a single edifice was originally three, closely spaced edifices, we will describe them individually. Hence, Str. 379-Sub1 is on the east end of this line and was investigated by digging Subop. 54CC (22m<sup>2</sup> excavated). Structure 379-Sub2 is 3m to the west and was partially exposed within Subop. 54CE (19m<sup>2</sup> cleared). Finally, Str. 379-Sub3 is 4m west of Str. 379-Sub2 and was partly revealed within Subop. 54CD (9m<sup>2</sup> cleared). Digging was pursued to maximum depths outside architecture of 0.43m, 0.47m, and 0.53m below modern ground surface in 54CC, 54CE, and 54CD, respectively (construction fill was plumbed to depths of 0.48m and 0.25m below modern ground level on Strs. 379-Sub2 and -Sub3). One major building phase was identified in each case.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.2-5	F.2	
2	Str. 379-Sub1	U.1-9, 20, 21	-	F.3	TCL
	Str. 379-Sub2	U.10-15, 22	-	-	
	Str. 379-Sub3	U.16-19, 23, 24	-	-	
3	-	-	S.1, 2	F.1	

### Time Span 1

The earliest activity attested to in the Str. 379 excavations was the laying down of at least 0.25m of a brown sand that contains numerous pebbles and rocks measuring up to 0.12m across (S.4; its base was not uncovered). Stratum 4 was only identified in Subop. 54CD where it runs under Str. 54-Sub3's northwest basal riser (U.18). In the environs of Strs. 379-Sub1 and -Sub2, S.4 is replaced by a coffee-brown sandy clay with a few pebbles each encompassing as much as 0.05m across (S.3). Stratum 3 underlies final-phase architecture in these cases and was exposed to a maximum thickness of 0.22m (its base lies beyond excavation limits in Subop. 54CC and CE). In the case of Subop. 54CE, a layer of densely packed rocks (S.5) underlies 0.06m of S.3.

Stratum 5's top was exposed but it was not further investigated where it was observed immediately south of Str. 379-Sub2. A dark brown clay with few inclusions (S.2) also began to accumulate during this interval. At least 0.15m of S.2 was laid down north of Str. 379-Sub2 now (its base was not revealed here) though this earth was apparently only introduced in the environs of the other two buildings after they were abandoned. The upper surfaces of S.3-5, in the limited areas where they were uncovered, were all flat.

A depression that was at least 0.24m deep (F.2) was identified directly beneath Str. 379-Sub1's U.3. Feature 2 was cut down into S.3 here. Its west wall dropping continuously 0.2m across 0.3m from west-to-east while on the north a descent to the south of 0.2m was achieved over 0.4m. The entity's base along with its south and east walls were not revealed. Feature 2 was filled with a dark brown sandy clay that contained many pebbles measuring up to 7mm across. What, if anything, the behavioral significance of F.2 might have been is unknown.

## Time Span 2

*Structure 379-Sub1:* This building looks to have been built into a ca. 0.4m-high rise from south-to-north. Its downslope, south face was raised to create a level surface running north-south, there being little sign that the higher northern flank was formally finished. Consequently, what we called Str. 379-Sub1 was a south-facing terrace that served to raise and stabilize the ground surface that backed that terrace to the north.

The aforementioned terrace consists of a 0.3m-high basal riser (U.1, 2, 8, and 9) that was traced for 4.8m at an orientation of about 107 degrees. Excavations in Subop. 54CC apparently cleared an outset measuring 4m northwest-southeast and projecting 0.8-0.95m southwest of the main body of the construction. U.1 is the outset's southwest face while U.2 and 9 form its southeast and northwest flanks. We did not encounter a southeast extension of the terrace past U.2 and cannot rule out the possibility that U.2 defines the terrace's southeast edge. On the northwest, the terrace continued for at least 1m in this direction (this segment designated U.8; its northwest end was not revealed). A 0.15m-tall step-up (U.3) fronted U.8, extending 2m southwest from that terrace facing. Unit 3 is surfaced with stones (included in U.3) and runs for at least 0.8m to the northwest at which point it leaves Subop. 54CC. It may have been that the top of the stone-rich, sandy clay that fills F.2 functioned as a surface that fronted U.3 for at least 1.17m to the south (designated F.3). Feature 3 covers the basal 0.05m of U.3 though whether it was introduced as fill to create this floor or was simply present before construction began is unclear.

The level terrain backing the southern terrace supports at least four stone blocks that rise no more than 0.28m high (U.4-7). Unit 4 measures 1.5m on a side and is bordered by the U.8 riser directly to the south. Unit 5, in turn, is 0.3m northeast of U.4, its southwest corner lying immediately north of U.4's northeast corner. Unit 5 encompasses 1.2m north-south by 1.35m. Unit 6 is 0.25-0.35m east of U.5 and covers 0.7m by 2.35m east-west. Located 0.75m to 1.35m north of U.6 is U.7. The latter is shaped like a trapezoid with its shorter segment on the northeast. The base covers 2.9m northwest-southeast while its northeast flank measures 1.75m across.

Two low stone walls (U.20 and 21) were seemingly added late to Str. 379-Sub1's south face. Unit 20 measures 0.55-0.7m across, widening from south-to-north, and projects 2.75m southeast from the U.3/1 junction. A 'L-shaped' wall (U.21) intersects U.20's east side at a point 1m north of the latter's south end. Unit 21, encompassing 0.3m across, projects 1.1m southeast from U.20 before turning at a right angle and running 0.8m to the northeast. A gap of 1.1m intervenes between U.21 and U.1, possibly providing access to an earthen-floored cubicle

bordered by U.1, 20, and 21. That compartment's interior measures 1.4m by 1.8m northwest-southeast.

In general, Str. 379-Sub1 was a 0.3m-high, stone-faced terrace that served to raise and stabilize terrain covering at least 4.5m northeast-southwest by 6.5m to the northeast. The terrace is fronted on the southwest by an outset that encompasses 4m northwest-southeast and projects 0.8-0.95m southwest of the main terrace line. A 0.15m-tall stone-faced and -surfaced step-up extends 2m southwest of the terrace at the point where the northwest side of the outset steps back northeast to join the main body of the terrace. A surface composed of pebbles set in a dark brown sandy clay may have fronted this step-up for at least 1.17m to the southwest. A surface level room, its earthen-floored interior encompassing 2.5m<sup>2</sup>, was built against the southwest outset late in the building's use-life. The compartment was entered through a 1.1m-wide door in its east corner. Backing the terrace to the northeast were at least four stone blocks that were either set even with ground level or rose as much as 0.28m above it. These closely spaced constructions cover 1.6-2.25m<sup>2</sup>. It was to support these blocks that the southern terrace was apparently built. The exposed portion of the whole complex covers ca. 56m<sup>2</sup>, the clearest alignments of extant constructions generally running northwest-southeast (the southern terrace is aligned approximately 107 degrees). All constructions raised now were fashioned primarily of cobbles with some efforts devoted to directing their flatter faces outwards. All of the rocks are set in a mud mortar.

*Structure 379-Sub2:* Structure 379-Sub2 was a stone-faced platform that was built over relatively level terrain. The building is ascended on the north by a 0.3m-tall by 0.45m-wide terrace (U.10). Unit 10's tread is surfaced with stones and gives way on the south to a 0.28m-tall riser (U.11) that fronts a 2.3m wide terrace that was likely also surfaced with rocks. The fill backing and underlying U.11 consists of a moderately dense concentration of small to medium-size rocks that are set in a dark brown clay (U.22). Unit 11 terminates on the south at a 0.2m-high step-up to the summit (U.12). Backing U.12 for 1.8m to the south is a block of stones set level with the summit surface (U.13). Unit 13 measures 1.65m wide east-west. Located 1.3m south of U.13 is the 0.42m tall step-up to the summit from the south (U.14). Unit 14 is fronted by a 0.15m-high, earthen-floored terrace (U.15) that extends 1.3m back north to U.14.

In general, Str. 379-Sub2 was a stone-faced, earth-and-stone-filled platform that stood 0.78m and 0.58m tall on the north and south, covered 7.3m north-south, and was oriented roughly 74 degrees. The building was fronted on the north by two terraces, the basal riser measuring 0.3m tall by 0.45m wide, its successor rising 0.28m high by 2.3m across north-south. Both of these treads were probably surfaced with stones. One 0.15m-high by 1.3m-wide earthen-floored terrace borders Str. 379-Sub2 on the south. Stone step-ups standing 0.2m and 0.42m high on the north and south gave way to a summit that encompasses 3.1m north-south. The only architecture recorded in our limited clearing of this elevated space was a block of tightly packed rocks that covered 1.8m north-south by 1.65m. This construction was apparently level with the summit's earthen surface and was set against the back of the northern summit riser. All constructions raised now were made primarily of cobbles set in a mud mortar. The flatter faces of the rocks were directed outwards.

*Structure 379-Sub3:* Suboperation 54CD exposed a limited portion of this building's northwest flank. Excavations here revealed two terraces (U.18 and 17) leading northwest-to-southeast to the summit step-up (U.16). Unit 18 is 0.1m tall by 0.95m wide, its tread surfaced with stones (included in U.18). The next riser, U.17, ascends 0.11m above the U.18 tread and projects 0.17m beneath it. Unit 17 gives way 1.95m to the southeast to U.16 which ascends

0.18m to the summit. The fill backing and underlying U.17 consists of a brown clay that contains a mix of small angular rocks and medium-size cobbles distributed unevenly throughout it (U.23). Suboperation 54CD also exposed the west side of a 0.2m-tall northwest extension of U.16 (U.19). Unit 19 projects 1.1m northwest of the summit riser and measures at least 0.55m across northeast-southwest, the remainder of this construction lying beyond excavation limits to the northeast.

Overall, by the end of TS.2, Str. 379-Sub3 was a stone-faced, earth-and-rock-filled platform that stood 0.39m high on the northwest, measures at least 3.5m northwest-southeast, and was aligned ca. 40 degrees. The building was faced by two terraces on the northwest that rose in increments of 0.1m and 0.11m from northwest to southeast towards the summit. The basal terrace tread spans 0.95m and was surfaced with rocks. The next ascending riser's earthen tread measures 1.95m across and is succeeded on the southeast by a 0.18m-tall riser leading to the summit. A projection extends 1.1m northwest of this riser, continuing to the northeast for at least 0.55m. A line of stones (U.24) was noted running due east-west in U.17's tread, 1m southeast of that terrace's northwest facing. Unit 24 was traced for 1.35m and did not relate to any other exposed architecture. This construction may have been part of an earlier building that was largely buried by the erection of Str. 379-Sub3. All architecture raised here during TS.2 was made mostly of cobbles, the flatter aspects of which were directed outwards. The stones are invariably set in a mud mortar. A single fragment of slag found associated with Str. 379-Sub3 very tentatively hints that some copper might have been processed here or nearby.

### Time Span 3

Following their abandonment, resumption of S.2's deposition covered the lower 0.04-0.28m of all three edifices. A fine-textured, dark gray-brown humus horizon (S.1) subsequently formed to a thickness of 0.07-0.14m atop S.2, blanketing all but the highest portions of TS.2 constructions. A few rocks (F.1) that likely tumbled from Str. 379's various components were found embedded in S.1 and upper S.2. Feature 1 was especially noticeable within 0.5m of Str. 379-Sub2's north face and atop that building's southern basal terrace (U.15). As this edifice was the most substantial of the uncovered buildings in this complex, it is perhaps not surprising that there was more of it to fall to ruin than was the case for its near neighbors.

### **Structure 405**

Structure 405 is located 12m west of Str. 372 and 17m southwest of Str. 376, immediately north of the seasonal stream course that borders Op. 53 on the south. Excavations conducted here in 2004 under L. Richardson's direction within Subop. 53AC, AE, and BX cleared 21m<sup>2</sup>, digging reaching a maximum depth of 0.48m below modern ground surface. Mapped as a platform, these investigations definitely disproved that initial interpretation. What Str. 405-1<sup>st</sup>'s form and function were remain anything but obvious.

### Time Spans

Time Span	Construction Phase	Units	Strata	Features	Date
1	-	-	S.4-6	-	TCL?

2	Str. 405-1 <sup>st</sup>	-	-	F.1-3	TCL
3	-	-	S.2, 3, 7	-	
4	-	-	S.1	-	

### Time Span 1

What seems to have been one layer, at least 0.12m thick, was laid down now. This deposit was exposed in discontinuous segments, characterized by slight differences in color and inclusions, and was followed for 3.6m north of F.2. The base of this heterogenous layer was not found. The northernmost portion measures 0.51m north-south and consists of a fine-textured, brown, sandy soil (S.4) that contains many small rocks among which were mixed a few medium-size cobbles. At a distance of 1.4m to the south a moderately hard-compacted, moderately fine-textured, dark gray-brown soil that includes a few small rocks (S.5) appears at the same level as S.4. Stratum 5 was traced for 1.6m north-south, disappearing beneath F.2. Underlying S.5 for 0.65m north of F.2 and extending 1.06m south of that putative construction is a soft-compacted, coarse-textured, dark brown soil (S.6) in which are embedded numerous small rocks along with medium-size cobbles.

Strata 4-6 together run relatively flat and seem to have been deposited by flooding, possibly from the nearby southern seasonal stream. It was on these layers that Str. 405-1<sup>st</sup> was built. A few artifacts, mostly pieces of chert but also some fragments of slag and *bajareque*, were found in these layers. Though cultural materials may have worked their way down from higher levels, their presence in S.4-6 could point to a human presence nearby when these soils were accumulating.

### Time Span 2

Excavations of Str. 405 exposed a large concentration of cobbles. Within that aggregate two possible wall lines (F.1 and 2) running more-or-less parallel east-west were tentatively identified. Feature 1, on the south, stood 0.35m high, was 0.6m wide, and was fashioned of large rocks set on end. Lying 1.85m to the north, F.2 is 0.25m tall by 1m wide east-west and consists of cobbles that were set horizontally and vertically. The area these features border on the north and south consists of a 0.2m-deep depression (F.3) the sides of which gradually drop from F.1 and 2 towards its round base. In a very general way, Str. 405-1<sup>st</sup> resembles Str. 366-1<sup>st</sup> in that both consist of cobble walls that served in part to define and contain shallow declivities. Structure 405-1<sup>st</sup> would, in this case, be a far less substantial version of such an arrangement than is Str. 366-1<sup>st</sup>.

### Time Span 3

Strata 4, 5, and 7 were now capped by 0.08-0.16m of a moderately hard-compacted, dark brown clay (S.3). For 3.6m north of F.2 and across F.3, S.3 is covered by 0.01-0.14m of dark gray-brown, hard-compacted, fine-textured soil that contains many pebbles (S.2). Stratum 2 runs fairly flat for this exposed extent. A lens composed a pale brown, coarse-textured, earth that incorporates white flecks and numerous small rocks along with an occasional medium-size cobble (S.7), was recorded embedded near the base of S.2 at a point 0.5m south of F.1. Stratum 7 is 0.12-0.3m thick and projects 0.44m north from the southern excavation limit. These slight

variations in soil textures, colors, and inclusions may point to an extended period during which the general area of Str. 405-1<sup>st</sup> was subject to periodic, small-scale floods. The building may have been abandoned by this time.

#### Time Span 4

The final event for which we have evidence in Str. 405-1<sup>st</sup>'s environs is the formation of a loosely packed, moderately fine-textured, dark gray-brown humus horizon (S.1) to a depth of 0.1-0.2m on top of S.2 and 3. Stratum 1 covers most of the stones associated with Str. 405-1<sup>st</sup> and contains very few rocks, none of which likely derived from that construction.

#### **Structure 407**

Structure 407 is 5m southeast of Str. 413, 14.2m north of Str. 372, and 28m east of Str. 373. Digging here during 2004 within Subop. 53BA, BB, BN, and BT under the direction of C. Novotny uncovered 8m<sup>2</sup>, excavations being pursued to a maximum depth of 0.43m below modern ground surface. One major occupation phase was identified in the course of this research.

#### Time Spans

Time Span	Construction Phase	Units	Strata	Features	Date
1	-	-	S.4	-	-
2	-	-	S.2, 3	-	
3	Str. 407-1 <sup>st</sup>	U.1	-	F.1	TCL
4	-	-	S.1	-	

#### Time Span 1

The earliest activity identified in the course of this work was the deposition of a very dark gray-brown sand that contained poorly sorted, sub-rounded gravel (S.4). At least one large rock, measuring 0.64m north-south was recorded protruding 0.16m up from S.4. Stratum 4 was only penetrated to a depth of 0.04m and was found to run flat for the 6m it was observed running north-south. Most likely, this soil results from an extensive and powerful inundation that covered this area.

#### Time Span 2

Stratum 4 was now covered by 0.15-0.2m of a fine-textured, compact, red-brown clay (S.3). This layer was, in turn, blanketed by 0.11-0.14m of a loosely compacted, moderately fine-textured, very dark gray-brown earth (S.2). Strata 2 and 3 run fairly flat over the 6m they were exposed running north-south.

### Time Span 3

Structure 407-1<sup>st</sup> consists of four boulders that together occupy an area of roughly 5m<sup>2</sup> (U.1). These rocks are roughly 0.5-.75m across by 0.23m high. One of the stones has a depression measuring 0.15m across by 0.03m deep in its upper surface. The indentation appears to be the result of repeated pounding on this spot, possibly using an implement like the ground stone hammer found in association with the boulders. A deposit (F.1) composed of densely packed small fragments of rocks that contain copper ore was found abutting one of the boulders on its south side. This material is apparently contained in a maximally 0.24m-deep pit that was dug into S.2 and measures 1.5m north-south by at least 1m east-west (the deposit's east and west margins were not uncovered).

It appears that the boulders comprising Str. 407-1<sup>st</sup> were used as stationary anvils on which copper-bearing rocks were broken up to begin the process of removing the ore embedded in them. Feature 1 comprises debris from that activity. Materials from copper smelting, including ceramic furnace pieces, vitrified adobe, and slag, were found scattered around Str. 407-1<sup>st</sup>. A 0.1m thick portion of S.2 underlying U.1 also contains furnace and slag pieces. This sequence may imply that an episode of copper smelting at this locale predated the establishment of the ore-crushing station.

### Time Span 4

Following Str. 407-1<sup>st</sup>'s abandonment, a 0.08-0.1m-thick soft-compacted, very dark brown humus horizon (S.1) formed atop S.2. The U.1 boulders still protruded about 0.1m above that level and it was these rocks that drew our attention to Str. 407.

### **Structure 411**

Structure 411 is located in Op. 54's northeast corner within generally level terrain, 50m northeast of Str. 379 and 62m northeast of the putative staircase exposed in Subop. 54CR. The large rock investigated within Subop. 54CM is 3m to the southwest. Digging here within Subop. 54CF-CL in 2013 uncovered 106m<sup>2</sup> in the course of clearing most of the building. Excavations reached maximum depths of 0.95m and 0.63m below modern ground surface beyond and within architecture, respectively. One major building phase was identified in the course of this work. Structure 411 was one of the more confusing constructions we have ever encountered in our investigations and its interpretation remains uncertain.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.4-6	-	
2	Str. 411-1 <sup>st</sup>	U.1-38	-	-	TCL
3	-	-	S.1-3	F.1	

### Time Span 1

What appears to have been the earliest activity identified within these investigations was the deposition of at least 0.18m of a yellow-brown clay (S.6) that was recorded off Str. 411-1<sup>st</sup>'s southwest flank (S.6's base was not encountered). Rocks measuring up to 0.04m across were found embedded in S.6. This layer was covered by 0.38-0.28m of a very fine-textured red-brown clay with very few inclusions (S.4). Stratum 6 is replaced by a gravel-rich soil (S.5) that was found underlying architecture for at least 0.2m (its base was not found) off the building's southwest flank, southeast of U.7 and 8. In general, S.4 was identified throughout most of the investigations that were deep enough to reveal the soils underlying TS.2 architecture. Strata 5 and 6 were more sporadically identified, the latter being found beneath S.4 in at least one case and S.5 being recorded directly under later architecture in an area where we expected to find S.4. It appears that the conditions governing soil deposition varied over short distances around Str. 411, a situation also noted in other parts of Op.53 and 54.

### Time Span 2

Structure 411-1<sup>st</sup> is a stone-faced platform that stood 0.7m tall, measured an estimated 5.2m by 27m northwest-southeast, and was aligned very approximately 321 degrees. Its fill (U.32) in the few areas where it was exposed is composed of a gravel similar to S.5. The building's perimeter is defined by basal facing (U.1-4) that were revealed in discontinuous segments the connections between them being extrapolated from these limited exposures. A staircase measuring 1.25m northwest-southeast is set flush with the platform's northeast side (U.1) slightly southeast of the building's center. The northeast basal wall may step back 1.2m to the southwest immediately southeast of the staircase, continuing at this new location for at least 1m to the southeast (the southeast end of this indentation, designated U.22, was not revealed). The two stone-faced risers (U.33 and 34) that comprise the staircase are 0.75m and 1m wide, lead directly to the summit, and are flanked by stone balustrades (U.5 and 6) measuring 0.5-0.8m across. Units 5 and 6 each end on the northeast and southwest in large rocks that encompass 0.75-0.8m across their longest dimensions. This staircase leads to an area that encompasses 8m<sup>2</sup> and is surfaced with stones (U.9). Unit 9 is flanked to the northwest and southeast by portions of the summit that are set roughly 0.2m higher.

On the northwest, this elevated space covers ca. 8m<sup>2</sup>, is paved with rocks (U.10), and contains what may have been a room in its southwest half. This compartment (Room 1) measures 1.1x2.7m, is bordered on the northeast and southeast by walls (U.11 and 36) composed of boulders (0.35-0.7m across) that may have been foundations for perishable upper walls. Gaps of 0.5m in the centers of U.11 (on the northeast) and U.36 (on the southeast) might have served as doors. The space is delimited on the northwest by a rectangular block of stone (U.25) set flush with the floor level and encompassing 0.95m by 1.5m northeast-southwest. Northeast of U.11, the U.10 floor seems to be open on its remaining sides while on the southwest Room 1 overlooks another set of steps (U.7 and 8) that project about 3.7m from the inferred line of Str. 411-1<sup>st</sup>'s southwest basal facing (U.3). Units 7 and 8 are 0.8m and 3m wide (from bottom to top), the top-most tread (U.8) being surfaced with rocks (included in U.8). A boulder (U.35) measuring 0.8x0.84m by 0.55m thick rests atop the platform's southwest basal wall (U.3) and may have marked the northwest side of the passage from the U.7 and 8 steps into Room 1.

Southwest of the U.9 pavement are two compartments (Rooms 2 and 3) that are set in a northwest-southeast line and are open on the southwest. Room 2, the northwest member of the dyad, covers 1.4x2.8m and is bordered on the northwest by a line of boulders (U.21, each rock measuring 0.6-0.8m across by 0.9-1m long) while its southeast margin is delimited by a low

cobble wall that is 0.6m wide (U.20). Passage between U.9 and Room 2 was unimpeded by architecture. Room 3, immediately southeast of Room 2, encompasses 1.3x1.4m and is defined by U.20 on the northwest and comparable walls (U.24 and 37) on the southeast and northeast. Unit 37, the northeast foundation, narrows from 0.7m to 0.4m from southeast to northwest while U. 24 on the southeast is 0.9m wide. A stone surface (U.38) covering 1.8m northwest by at least 1m northeast-southwest was found on ancient ground surface fronting Room 2 (the floor's southwest edge was not revealed).

Bordering U.9 on the southeast is a raised pavement (U.19) that is equivalent in height to U.10 on the northwest. Unit 19 measures 16m<sup>2</sup>, much of that space being taken up by a large (1.7x2m) stone block (U.12) set level with the floor. The U.19 floor is open on all sides save the southeast where walls (U.13 and 14) mark its edge. Units 13 and 14 are 0.3m high by 0.6m (U.13) and 0.3m (U.14) wide. Unit 13 runs northeast-southwest for 2m at an angle of ca. 53 degrees and incorporated a boulder (0.8m across) at its northeast end. Unit 14 diverges from this alignment, extending 1.8m due south from U.13's south corner. Lying 1.05m southeast of U.13 is another stone block (U.15), set flush with the earthen summit surface, and measuring 1.1m by 1.85m southeast-northwest. Unit 15 occupies the center of Room 4 which is open to the northeast and southwest and bordered by U.16 on the southeast. This earthen-floored space encompasses 3.1m by 4.5m northwest-southeast. Unit 16, along with U.17 and 18, in turn, delimit the northwest, southwest, and southeast side of a cubicle (Room 5) that is open to the northeast and measures 0.9x1.05m. These low walls are 0.7-0.8m wide, U.16 ending in a boulder (0.9x1.3m) on its northeast end while U.18, the southeast foundation, runs along the top of U.2, the platform's southeast basal facing. Another low wall (U.23), 0.3m wide, projects 0.65m southeast of U.2. Unit 23 may have been a foundation used to delimit a building or shelter of some sort that was raised directly against Str. 411-1<sup>st</sup>'s southeast side, U.2 forming the northwest flank.

Returning to the summit, a stone surface (U.26) extends for approximately 3.5m northwest of the U.10 floor and ends on the northwest at Room 6. This earthen-floored compartment measures 1.5x2m and is bordered by low foundations (U.27-29) on all sides save the southwest where it looks out over the platform's southwest basal facing (U.3). These footings are 0.3m (U.27 on the southeast), 0.6m (U.28 on the northeast), and 0.25m wide (U.29 on the northwest). A 1.1m-wide gap between U.27 and 28 in the compartment's northeast flank might have provided access to Room 6 from that side. Bordering this compartment on the northwest is another earthen-floored enclosure open to the southwest (Room 7), this one covering 1.45x1.6m. Room 7 is bordered by a 0.7m-wide footing on the northwest (U.30) while U.29 bounds the space on the southeast and a continuation of U.28 marks off the cubicle's northeast side. The 0.75m separating U.28 and 30 may have provided access to Room 7 through its north corner.

What might have been part of a surface-level building adjoining, but not joined to, Str. 411-1<sup>st</sup> on the southwest is a 0.3m-tall by, minimally, 0.7m-wide wall (U.31) that was 1.9m long (its northwest side was not exposed). Unit 31 is oriented ca. 55 degrees and stops 1m short (southwest) of Str. 411-1<sup>st</sup>'s southwest basal facing (U.3).

By the end of TS.2, Str. 411-1<sup>st</sup> was a stone-faced, small-stone-filled platform that stood 0.7m tall, measured 5.2m by 27m, and was oriented roughly 321 degrees. A 1.2m-wide staircase composed of two risers and bounded by stone balustrades mounts the buildings northeast side slightly southeast of its center. Another apparent staircase, also with two risers, ascends the building's southwest flank. This access feature projects 3.7m southwest of the platform and was set northwest of Str. 411-1<sup>st</sup>'s centerline. The superstructure consists of a series of four paved surfaces that run in a northwest-southeast line. The central element in the sequence (U.9)

overlooks the northeast steps, covers 8m<sup>2</sup>, and is set 0.2m below the neighboring pavements to the northwest and southeast. Its northwest analogue (U.10) covers 8m<sup>2</sup> and contains a room encompassing 3m<sup>2</sup> on its southwest half where it overlooks the outset southwest staircase. Another paved surface (U.26) extends 3.5m northwest of U.10 while U.19, the elevated floor southeast of U.9, encompasses 16m<sup>2</sup> and is open on all sides save the southeast. On both the northwest and southeast is a sequence of two rooms set in a northwest-to-southeast line. Turning first to the compartments lying southeast of U.19, these cover 14m<sup>2</sup> and 1m<sup>2</sup> from northwest to southeast. Room 4, the larger, northwestern member of the pair, is open to the northeast and southeast while its smaller southeastern neighbor is unobstructed by architecture only on its northeast side. The rooms northwest of U.26 cover 3m<sup>2</sup> and 2.3m<sup>2</sup>, progressing from Room 6 on the southeast to Room 7 on the northwest. Both compartments are open to the southwest and have doors in their northeast sides. The remaining rooms within Str. 411-1<sup>st</sup>'s superstructure are set in a northwest-southeast line immediately southwest of U.9, are open to the southwest, and cover 3.9m<sup>2</sup> (Room 2 on the northwest) and 1.8m<sup>2</sup> (Room 3 on the southeast). The walls bordering Rooms 1-7 are low stone foundations that likely supported perishable upper walls. No built-in architecture such as benches and shelves were identified though blocks of stones set flush with floor levels were noted in Rooms 1 and 4. Hints of surface level buildings that were raised adjoining Str. 411-1<sup>st</sup> were noted off the platform's southeast (U.23 foundation) and southwest flanks (U.31, a possible foundation, and the U.38, a stone floor). All constructions built during TS.2 were made primarily of river cobbles the flatter aspects of which were directed outwards. These rocks were set in a mud mortar.

### Time Span 3

Following Str. 411-1<sup>st</sup>'s abandonment, 0.14-0.22m of a coffee-brown sandy clay (S.3) accumulated atop S.4. There was no sign of S.3 above S.5. Subsequently, S.3 was blanketed by 0.07-0.26m of a dark brown clay (S.2). A fine-textured, dark gray-brown humus horizon (S.1) eventually formed to a thickness of 0.07-0.22m atop S.2 and came to cover most of Str. 411-1<sup>st</sup>. A moderately dense concentration of rocks (F.1) that likely fell from TS.2 architecture was recorded within S.1-3.

### **Structure 413**

Structure 413 was a collection of debris resulting from copper processing that was identified on ground surface 5m northwest of Str. 407. There were no surface-visible signs of architecture here though fragments of ceramic furnaces were visible on ground level. Our initial impression was that what we glossed as Str. 413 was a work station set on ancient ground surface and associated with copper processing. Fully 7m<sup>2</sup> was cleared here within Subop. 53CN during the 2013 field season, digging reaching a maximum depth of 1.05m below modern ground surface. In the course of this work, two major occupation phases were identified.

After having established the existence of a work station in Subop. 53CN (Str. 413-Sub1) we sought additional signs of comparable activity loci. One such test, Subop. 53CP, was a 0.5x0.5m excavation dug 8m southeast of Subop. 53CN. This probe did not yield any evidence of human occupation, let alone signs of copper working. Suboperation 53CQ, a 1x1m test pit, dug to a maximum depth of 0.3m below modern ground surface, did reveal another work space comparable to that uncovered in Subop. 53CN. Suboperation 53CQ is located 4.7m west of Subop. 53CP and 4.1m south of Subop. 53CN. Material relating to copper working retrieved from 53CQ was recorded at 0.12-0.15m below modern ground level. Whether that locus was a

continuation of Str. 413-Sub1 or was a separate activity area we did not determine as time and money were running out as the 2013 field season drew to a close. We are including the limited Subop, 53CQ findings within Str. 413, treating them as a continuation of that work area, primarily for the sake of convenience.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.5	-	
2	Str. 413-Sub2	-	-	F.2-4	TCL?
3	-	-	S.5, 7	-	
4	-	-	S.4	-	
5	-	-	S.3, 6	-	
6	-	-	S.2	-	
7	Str. 413-Sub1	-	-	F.1, 5, 6, 7	TCL
8	-	-	S.1	-	

### Time Span 1

The earliest event identified within Subop, 53CN was the laying down of at least 0.06m of a fine-textured, hard-compacted, light brown clay (S.5; its base was not encountered). As S.5 resumed deposition during TS.3, it is difficult to say how much of it was introduced during this interval. The estimate offered here is based on the amount of S.5 that would need to have been in place to support F.1 and 2.

### Time Span 2

The remains of what seems to have been the southeast corner of a building (Str. 413-Sub2) were recovered in a 1m by 2m (north-south) probe dug in the southeast corner of Subop. 53CN. Structure 413-Sub2 was comprised of F.2 and 3 which appear to have been cobble walls standing 0.1m high and measuring 0.5m (F.2, the south wall) and 0.6m across (F.3, the east wall). These may have been the foundations for a surface-level building. We designate F.2 and 3 as 'features' as so little of them were exposed that we could not be certain that they were parts of a construction. Nonetheless, the rocks comprising F.2 and 3 were flat-laid and seem to have been purposefully placed. Not enough of these walls was revealed to determine their orientations.

At a distance of 0.37m to the south of F.2, and at roughly the same elevation, was a small pile of cobbles (F.4) that encompassed at least 0.42m north-south by 0.2m high (the full depth and extent of F.4 were not exposed). Feature 4's component rocks did not appear to have been

part of a coherent construction and might represent debris fallen from architecture located beyond excavation limits to the south.

The only artifacts associated with F.2-4 were a few fragments of copper slag.

### Time Span 3

Features 2-4 were now covered 0.1m of S.5 that resumed accumulating during this span. The upper surface of S.5 runs flat for the 2m it was exposed north-south and 1m it was revealed east-west. A lens (S.7) composed of numerous, small, river-rounded pebbles set in a fine-textured, light brown soil projects 0.36m south of the probe's north wall into S.5. Stratum 7 is at least 0.08m thick (its base was not revealed), its highest observed point equal to the top of S.5. This deposit may be the remains of a localized flood that coincided with, or slightly post-dated, the abandonment of Str. 413-Sub2.

### Time Span 4

Strata 5 and 7 were covered by 0.14-0.34m of a fine-textured, hard-compacted, brown clay that was largely devoid of cultural material (S.4). Stratum 4 drops 0.2m over 1.6m from south-to-north, leveling out on the north for the remaining 0.4m of its uncovered extent.

### Time Span 5

This period witnessed the deposition of several strata that contain dense concentrations of small (maximum diameter of 0.03m) river-rounded pebbles (S.3 and 6). Strata 3 and 6 rest directly on S.4, their component rocks set in a sandy brown soil. Stratum 3 is 0.04-0.26m thick, decreasing in thickness as it travels south-to-north for 0.78m; it rests atop the south-to-north drop off described under TS.4 for S.4. Stratum 3's south end was apparently truncated by the digging of F.5 while its north edge lies beyond excavation limits. Stratum 6 pinches out 0.77m east from the west edge of the deep probe, is maximally 0.08m thick, and is 0.27m west of S.3. In so far as these deposits resulted from flooding episodes, it appears that this locale was subject to periodic inundations that might have disrupted occupation here.

### Time Span 6

Strata 3 and 6 were now covered by 0.04-0.42m of a fine-textured, moderately hard-compacted, medium-brown clay (S.2). Stratum 2's upper surface seems to have run flat over the 7m<sup>2</sup> it was exposed though digging into it at several points (F.5 and 6) makes it difficult to be sure on that point.

### Time Span 7

Structure 413-Sub1 is a work area set atop S.2 that encompasses at least 6m<sup>2</sup> (F.1). The debris that constitutes F.1 is composed of broken ceramic furnaces, iron-rich stones containing copper ore, and quartz used as flux in the firing process. A rough line of furnace fragments stretches for 2.5m northeast-southwest on the east edge of the locus, most of the remaining materials being concentrated to the west. The full dimensions of F.1 were not determined, this activity area likely continuing beyond excavations to the north, west, and south.

No clear constructions were found here though the outlines of two pits (F.5 and 6) were tentatively identified within the locus. Feature 5, revealed in Subop. 53CN's southeast corner, is 0.24m deep, measures at least 0.3m north-south by 0.27m east-west, and cut through S.3 down to the top of S.4 (the south and east limits of F.5 were not found). Feature 6 is immediately west of F.5, and encompasses 0.72m across by 0.23m deep. Features 5 and 6 lie 0.85m west of the line of ceramic furnace pieces that delimit F.1 on the east. Neither pit was distinguished by its contents and their purposes are not clear.

The material found in Subop. 53CQ, 4.1m south of Subop. 53CN, are much the same as those comprising F.1. In the former case, however, these items were found on a 0.1m-thick layer of stones (F.7) that rests atop S.2.

What F.1 may well represent is a scatter of informal work spaces that are scattered around the Str. 407 stone anvils which are 5m distant from Subop. 53CN. Some of these spaces might have been surfaced with rocks, as was the case for Str. 373-Sub3 (U.3), while others were not.

### Time Span 6

Following Str. 413-Sub1's abandonment, a fine-textured, moderately hard-compacted, dark brown humus horizon (S.1) formed to a thickness of 0.14-0.24m atop S.2. It was S.1 soil that ultimately filled F.5 and 6.

### **Structure 414**

Structure 414 is in the southeast corner of Op. 53, bordering the north side of the seasonal stream that runs along the Operation's south side and 7m south of Str. 368. The closest test pit in the line paralleling the swale's north margin is Subop. 53CG, 6m to the west. The terrain here rises 0.75m over 7m from south-to-north. Digging within Subop. 53CC during 2013 consisted of a trench measuring 1m by 10.24m north-south that cut across the building near its approximate center and continued into the north side of the quebrada. In addition, an area extending for 5m west of the axial trench's north end was exposed to clarify what seemed to be wall lines that were visible on the surface. In all, 35m<sup>2</sup> was cleared in the course of this work, excavations being pursued to a maximum depth of 0.9m below modern ground surface. By-and-large, most of the exposed constructions were shallow, being found within 0.6m of ground level. Very few artifacts were recovered from these excavations, a situation that contrasts with investigations conducted further to the west but which matches observations made in trenches dug further to the north within Op. 53 and throughout Op. 54. The exposed architecture was subtly expressed, making the delineation of constructions and their relations challenging. What follows, therefore, is an estimate of building forms and connections in which we have some, if not absolute, confidence.

### Time Spans

Time Span	Construction Phase	Units	Strata	Features	Date
1	-	-	S.5	-	-
2	Str. 414-Sub6	U.5, 6	-	-	TCL?

3	-	-	-	F.2	
4	Str. 414-1 <sup>st</sup> Str. 414-Sub1  Str. 414-Sub2  Str. 414-Sub3 Str. 414-Sub4 Str. 414-Sub5	U.1-4, 19 U.11-15, 16 18, 21 U.9-11, 20, 22, 23 U.17 U.7 U.8	-	-	TCL    F.3
5	-	-	-	F.1	
6	-	-	S.1-4	-	

### Time Span 1

The initial activity for which Subop. 53CC provides evidence is the deposition of a layer of large rocks (S.5) in the base of the southern seasonal water course. Within the uppermost 0.14m of S.5 that was exposed, the rocks are set in a moderately hard-compacted, fine-textured, light brown clay. No artifacts were retrieved from this level.

### Time Span 2

Structure 414-Sub 6 consists two stone walls (U.5 and 6) that join to form a 'T-shape.' Unit 6, the cross-bar of the figure, is 0.2m wide, 0.12m tall, and runs for 1.1m at an orientation of 49 degrees. Unit 5 intersects U.6 at a point 0.45m southwest of the latter's northeast end. The former encompasses 0.2m across, is 0.18m high, and was traced for 0.6m at an alignment of ca. 127 degrees before leaving excavation limits. Given the modest dimensions of these walls, they were likely parts of a surface-level edifice, U.5 possibly separating two earthen-floored compartments, one located northeast and the other southwest of that footing. In that case, U.6 would have bordered the building on the northwest, the enclosures lying open to the northeast and southwest. That is a lot of inference to rest on two small walls. Suffice it to say that Str. 414-Sub6 was raised directly on ground surface and contained at least two rooms of unknown dimensions. Units 5 and 6 were fashioned of unmodified river cobbles that were set in a mud mortar.

### Time Span 3

Structure 414-Sub6 was subsequently covered by a 0.25-0.32m-thick layer of small to (mostly) large cobbles that are set in a moderately hard-compacted, fine-textured, brown clay (F.2). Feature 2 was recorded over most of the 25m<sup>2</sup> excavated west of the axial trench tentatively suggesting that it was introduced to raise and level ground surface in this area.

### Time Span 4

*Structure 414-1<sup>st</sup>:* The axial trench revealed the full north-south width of Str. 414-1<sup>st</sup>. This platform is fronted on the north by a 0.35m-high riser (U.4) that ascends directly to the summit. The latter is surfaced with a pavement composed of small stones (U.3) that was clearly traced for 1.4m to the south at which point it seemingly petered out. Unit 3 likely continued across the full 4.54m north-south width of the summit, ending on the south at U.1. This substantial facing stood 0.6m tall when excavated but we infer that it originally ascended a total of 1.06m, bringing it even with the top of the platform. Fronting U.1 on the south is a 1m-wide (north-south) by 0.5m-high terrace (U.2), its tread which leads back north to U.1 was possibly surfaced with stones (included in U.2). Unit 2 seems to have been built into the north bank of the southern swale. The fill backing U.1 to the north is composed of a dense packing of (primarily) small and medium-size cobbles that are set in a softly compacted, coarse-textured sand (U.19). The larger of these stones appear to have been flat-laid.

In all, Str. 414-1<sup>st</sup> is a stone-faced and –filled platform that stood 0.35m tall on the north, 1.56m high on the south, measured 5.54m wide north-south, and was aligned roughly 115 degrees. The building is fronted on the south by a 0.5m-tall by 1m-wide terrace that gives way on the north to a 1.06m-high ascent to the summit. A single riser leads to the summit on the north, the differences in the platform's height on its two exposed sides reflecting the natural south-to-north rise in the terrain over which Str. 414-1<sup>st</sup> was built. The summit measures 4.54m across and was surfaced with a layer of small rocks. There were no other signs of superstructure architecture recovered in our limited exposure of the summit. A fragment of *bajareque* found on the summit hints at the former presence of a perishable construction atop the platform. All of the remaining architecture that pertained to Str. 414-1<sup>st</sup> was made using cobbles, set in a mud mortar, and, in the case of facings, with their flatter aspects directed outwards.

*Structure 414-Sub1:* The remaining constructions uncovered in Subop. 53CC consist of low platforms and surface-level buildings that are north of the platform. The largest of these is Str. 414-Sub1 the irregular shape of which suggests that it was put together informally over an extended period of time. It may have begun with the construction of its two largest constructions, U.13 and 15. The former is a stone wall that runs for 3m at an orientation of approximately 79 degrees and is 0.2m tall. Unit 13 is 0.55m wide over 2.1m of its length, narrowing to 0.25m across for 0.9m at its northeastern end. The reduced width is accomplished by stepping the wall's northwest face back (southeast) for 0.3m. Unit 13 intersects U.15 at a point 0.7m north of the latter wall's south edge. This construction is 0.25m high, 0.5m wide, and measures 2.05m long over which distance it is aligned ca. 15 degrees. A 0.25m-wide wall (U.14) abuts U.13's north side at a point 0.7m east of the latter's east end. Unit 14 is 0.2m tall and extends at a right angle 0.9m north from U.13. Together, U.13-15 might have formed an irregularly shaped surface-level building that encompassed 0.9x3m and enclosed an earthen-floored compartment that covered 0.9m north-south by 2-2.3m east-west and was open on the north. Units 13 and 15 are unusually wide for stone foundations and might have doubled as supports for perishable upper walls and benches or shelves.

Subsequently, four additional constructions (U.11, 12, 16, and 18) were added that together closed off Str. 414-Sub1's north side. Unit 16 is an 'L-shaped' wall that is 0.2m wide by 0.2m high and runs between U.15 on the east and U.16 on the west. The 'leg' of the 'L' borders U.15's west side for 0.55m, turning west at U.15's north edge. The 'stem' of this figure then runs 0.65m to the west at a right angle to the eastern element, ending at U.11. This is a rectangular stone construction that encompasses 0.4m east-west by 0.7m and is 0.2m tall. Unit 11 extends 0.65m north from its intersection with U.16 and abuts U.18 on the west. The latter is a large (0.5x0.7m) boulder. Unit 12, a 0.4m-wide by 0.2m-tall wall, extends 1.95m south from U.18,

joining U.13 at a point 1.35m northeast of that wall's southwest terminus. The area now enclosed by U.11-16 and 18 was filled with cobbles (U.21), the whole converted into a 0.2m-tall platform. Structure 414-Sub1's perimeter very roughly approximates an 'L,' with the leg projecting eastward from the north-south-running stem. The 'leg' is bordered by U.13, 15, and 16, encompassing 1.45-1.4m north-south by 1.5-1.6m east-west. The 'stem,' in turn, covers 1.45m east-west by 1.95m north-south. No evidence of superstructure construction was noted here. The varied orientations of the perimeter facings, ranging from 1 to 79 degrees may indicate that Str. 414-Sub1 was not built to conform to a single plan but arose in the course of making multiple additions to the edifice over a protracted span.

Unit 14 remained standing during the final building phase but was not incorporated in the platform. It may now have defined the west side of a 0.5m-wide by 0.9m-long compartment formed by U.12 and 13 on the south and east, and open to the north.

*Structure 414-Sub2:* This building is a 0.2m high platform that encompasses 1x1.1m and is aligned approximately 86 degrees. Its south wall (U.9) intersects the U.11 stone block at a point 0.15m south of the latter's northeast corner and extends 1.1m east where it corners with U.10. The last facing runs 0.5m to the north where it abuts a sizable boulder (U.23) that covers 0.5m in diameter. Fully 0.6m separates U.23 from another comparable rock (U.20), this one encompassing 0.4m by 0.5m east-west. Units 20 and 23 seem to form the northwest and northeast corners of Str. 414-Sub2 though no wall runs between them that might have served to retain the cobble fill (U.22) that comprises the building's hearting. A similar situation was noted on the west where the 0.35m separating the U.20 rock from U.11 on the south was not spanned by a fill-retaining wall. It may be that these gaps were so narrow that the builders did not see the need to seal them formally.

*Structure 414-Sub3:* The only clear construction that constitutes this building is a 0.2m-high by 0.25m-wide wall (U.17) that is 0.5-0.8m south of Str. 414-Sub1. Unit 17 projects 1.9m east from the west excavation wall over which distance it is aligned roughly 93 degrees. The wall's west end was not uncovered though it did terminate clearly on the east. Five boulders arranged in two roughly parallel lines lie 0.3m south of U.17 and cover 1.5m (on the east) and 3.7m (on the west) north-south (F.3). The three eastern rocks are spaced 0.3m and 0.1m apart (heading north-to-south) and measure 0.5-0.6m on their longest dimensions. The pair in the western line are separated by 2.3m, the northern example measuring 1m in diameter while its southern counterpart encompasses 0.5m across. The lines are separated by 2.2m east-west of open earth. We could not discern in the field if these large rocks had been placed in their find spots by human hands and, if so, what purposes they might have served. The behavioral significance of U.17 is also unclear. It might have been a terrace slowing erosion down the north-to-south drop towards the quebrada but why such a retaining unit should stop so abruptly on the east is not certain.

*Structure 414-Sub4:* The only portion of this building that was located consists of a 0.26m-high by 0.35m-wide wall (U.7) that was recorded 1.2m north of Str. 414-1<sup>st</sup>, sitting on F.2 above Str. 414-Sub6. Unit 7 extends 0.8m west from the east wall of the axial trench and was oriented very approximately 107 degrees. Most likely U.7 is a foundation that was incorporated within a surface-level construction most of which lies east of Subop. 53CC.

*Structure 414-Sub5:* This construction consists of a curved stone wall (U.8) that was 0.17m high by 0.2m wide. In all, U.8 covers 2.1m running northeast-southwest, its concavely

curving side facing to the southeast, the depth of the arc measuring 0.2m. Unit 8 is 1.6m northwest of Str. 414-Sub4 and as close as 0.25m to Str. 414-Sub1 on the west. There are no signs that this construction was ever part of a larger edifice; U.8 was apparently built to be free-standing. What functions it might have served are frustratingly opaque.

*Overview:* What was mapped, based on surface indications, as an extensive platform covering 7x15m turned out on excavation to consist of a raised area (Str. 414-1<sup>st</sup>) bordered by a warren of low platforms and surface-level buildings that clustered around Str. 414-1<sup>st</sup> on at least its north and west. All of these constructions were made primarily using river cobbles set in a mud mortar. Some effort was devoted to directing the flatter aspects of the rocks outward. None of the constructions seem to have functioned as residences. The sizes of the two low platforms that were cleared north and west of Str. 414-1<sup>st</sup> (Str. 414-Sub1 and Str. 414-Sub2) generally match the dimensions of work spaces associated with copper processing at Str. 376-2<sup>nd</sup> (U.1) and Str. 372-1<sup>st</sup> (U.1). Nonetheless, aside from a fragment from a ceramic furnace and several pieces of copper that were found in their environs, there were no other indications of copper working here. The large boulders comprising F.3 resemble those used as anvils within Str. 407-1<sup>st</sup> yet they showed no signs of having served such a purpose. In general, therefore, there are hints that the constructions uncovered in Subop. 54CC were built to serve as work areas, possibly as part of the copper workshop that is better attested to further west within Op. 53. Evidence that would support that contention remains sparse at best.

#### Time Span 5

The event that marks this interval was the deposition of as much as 0.76m of densely packed stones set in a coarse-textured brown sand (F.1). Feature 1 covers Str. 414-1<sup>st</sup>'s U.2 and likely obscured all of U.1's south face, extending 0.36 south of the former construction. Most of the rocks that were large enough to determine their orientations were found lying flat. The deposit ends fairly abruptly on the south, tentatively suggesting that the vertical stack of medium-size cobbles that defines its limit on this side might have been part of a 0.82m-high retaining wall. If that was the case, the putative wall was not formally finished. Feature 1 might have been part of a late construction effort that was designed to expand Str. 414-1<sup>st</sup>'s summit 1.36m to the south, that work never having been finished.

Large numbers of rocks were also found piled around Strs. 414-Sub1 through -Sub5 (included in F.1). These rocks might have been introduced to fill in gaps among the extant constructions, creating a relatively continuous surface that encompassed roughly 25m<sup>2</sup>.

#### Time Span 6

After the abandonment of this architectural complex, 0.2m of a moderately hard-compacted, fine-textured, light brown clay (S.4) was laid down on the north bank of the southern swale, covering S.5 and the basal 0.2m of F.1. Stratum 4, in turn, was blanketed by 0.12-0.3m of a soft-compacted, moderately fine-textured, dark gray-brown earth (S.3). Unlike its predecessor which lies flat over the 0.82m it was revealed running north-south, S.3 rises 0.26m from south-to-north over this distance. More rocks (small to medium-size cobbles) were found in S.3 than was the case for S.4. Strata 3 and 4 were only identified on the south margin of the axial trench that was dug across Str. 414-1<sup>st</sup>. Stratum 2, a moderately hard-compacted, fine-textured, brown clay, was found throughout Subop. 53CC. This dirt covers S.3 by 0.12-0.24m, narrowing from south-to-north over the 0.82m it was observed riding over S.3's upward

slope. North of Str. 414-1<sup>st</sup>, S.2 blankets the F.2 fill by 0.1-0.2m. Finally, a 0.12-0.14m-thick soft-compacted, fine-textured, dark gray-brown humus horizon formed atop S.2. Strata 1 and 3 closely resemble each other and it is possible that the latter was an early organic-rich level the formation of which was curtailed by its burial by S.2.

## Large Stones

### *Suboperation 53CI*

Suboperation 53CI consists of two trenches set in an east-west line with 2.08m of unexcavated terrain between them. The westernmost member of the dyad is 1m east of Subop, 53CA on Str. 373 and is 2.5m directly east of Str. 373-Sub4. Each trench measures 1m north-south, the western example covering 1.91m east-west while its eastern counterpart encompasses 1.94m in that direction. Suboperation 53CI ends on the east at a large rock (F.1) that was visible on ground surface. Given that boulders were used as anvils in early stages of copper processing at Str. 407, Subop. 53CI was dug to see if this rock served a similar purpose. Digging pursued here during the 2013 field season reached a maximum depth of 0.98m below modern ground surface.

### Time Spans

Time Span	Construction Phase	Units	Strata	Features	Date
1	-	-	S.6	-	-
2	-	-	S.4, 5	-	TCL
3	-	-	-	F.1, 2	TCL
4	-	-	S.3, 2, 7	-	TCL
5	-	-	S.1	-	-

### Time Span 1

A fine-textured brown clay characterized by its included white, black, and orange flecks and numerous rocks (S.6) constitutes the earliest depositional unit in Subop. 53CI. Stratum 6 closely resembles S.10 identified in Subop. 53CA immediately to the west. Stratum 6 was exposed to maximum thickness of 0.27m (its base was not uncovered) and was seen to rise 0.16m over 4.5m from west-to-east. No cultural material was found within this layer and, as was inferred for S.10 in the Str. 373 investigations, S.6 likely resulted from at least one episode of major flooding.

### Time Span 2

Stratum 6 was blanketed by 0.2-0.38m of a hard-compacted, fine-textured, brown soil (S.4; this layer is likely an eastern continuation of S.5 revealed in Subop. 53CA to the west).

Stratum 4 runs flat for 1.3m east from the west margin of the western trench after which it ascends 0.15m from west-to-east across 0.3m in a gently sweeping curve. From this point we infer that S.4's upper surface remained level for at least 3m to the west. In general, the westernmost 1.6m of S.4 resembles a flat-bottomed pit the east edge of which is defined by the concave upward slope described above. No other evidence came to light in support of this interpretation and we cannot rule out the possibility that the observed form of S.4's upper surface resulted from the operation of natural forces. Artifacts retrieved from S.4 point to a human presence in the immediate area while this soil was accumulating.

Embedded within S.4, 0.09m above the latter's interface with S.6, is a lens (S.5) composed of a brown clay that is distinguished from S.4 by the dense concentration of small (0.02-0.03m on their longest dimensions), angular, white rocks and flecks of the same color. Stratum 5 is 0.6m long north-south and runs relatively flat over that distance.

### Time Span 3

Feature 1 was likely raised atop S.4. Located at the east edge of Subop. 53CI, F.1 consists of a large, triangular-shaped rock that is 0.5m thick, 0.67m wide, and 1.3m long north-south. This boulder is fronted for up to 1.75m on the west by a pebble surface (F.2). Feature 2 abuts the west face of the F.1 rock and does not have a clear, formalized edge on the west. Few artifacts were associated with F.1 and 2; there were no signs that F.1 was used in processing copper. Though the juxtaposition of the boulder and rock layer may have been the fortuitous outcome of natural processes, this seems unlikely given the rarity of such large stones in the area and the lack of evidence for floods of sufficient magnitude to have deposited the boulder in this part of Op. 53. Consequently, we lean towards the view that F.1 and 2 were purposefully put in place by human hands though for what purposes we cannot tell.

### Time Span 4

Occurring now is the deposition of 0.2-0.3m of a very hard-compacted, fine-textured, brown earth (S.3) that is distinguished from S.5 by the greater concentration of small white flecks found within it. Stratum 3, which appears to be the eastward continuation of S.4 in Subop. 53CA, covers F.2 and the lower 0.11m of the F.1 boulder. At least one piece of a ceramic furnace was noted within S.3 in the west wall of the west trench. This may signify that Subop. 53CI encountered the east edge of the U.4 deposit that constitutes Str. 373-Sub2. A 0.02m-thick lens composed of small, angular pebbles (S.7) projects 0.3m east from the west wall of the eastern trench. It sits 0.17m above the S.3/4 interface. An identical deposit (S.2), this time 0.03-0.07m thick, was recorded extending 1.16m east from the west margin of the western trench. Stratum 2 sits atop S.3, at the same level as the S.1/3 interface. Stratum 2 is 0.07m above S.7, the latter being 2.8m to the east of S.2. There is no strong reason to see either lens as the result of purposeful human activity.

### Time Span 5

The last event chronicled within Subop. 53CI is the formation of a 0.12-0.18m-thick fine-textured, dark brown humus horizon atop S.2 and 3. At the time of excavation, F.1 still projected 0.25m above the ground surface that was constituted by the top of S.1.

### *Suboperation 53CO*

Suboperation 53CO was dug in 2013 to determine if a particularly large stone (U.1) was purposefully raised where it was visible on ground surface 1.5m west-southwest of Subop. 53CM (Str. 368) and 7m north of Str. 414. Digging within Subop. 53CO cleared 11m<sup>2</sup>, excavations being pursued to a maximum depth of 0.28m below modern ground surface. One construction episode was identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.2, 3	-	
2	Str. 53CO-Sub1	U.1-11	-	-	TCL
3	-	-	S.1	-	

### Time Span 1

The earliest activity attested to in Subop, 53CO is the deposition of at least 0.03m of a yellow-brown sandy silt (S.3; its base was not encountered). Stratum 3 was only revealed where it runs Under U.1 on the southwest. It is covered here by 0.1-0.12m of a moderately hard, fine-textured, brown clay (S.2). Stratum 2 covers the lower 0.1m of U.1 on the southwest, its upper surface apparently constituting the ground surface on which Str. 53CO-Sub1 was raised.

### Time Span 2

The focal point of Str. 53CO-Sub1 is a large, triangular rock (U.1). Unit 1 is 0.63m wide by 1.07m northwest-southeast, by 0.72m high. It is bordered on the northeast by a 0.26m-wide by 0.2m-high stone wall (U.2) that may have been intended to stabilize the boulder on this flank. Unit 9, a line of sizable cobbles, borders U.1 on the northwest. This construction is 0.3-0.53m wide by 0.5m tall. A third stone wall (U.11) seems to have hemmed in U.1 on the southwest, this one standing 0.1-0.3m tall. Units 2, 9, and 11 are set against and around U.1, the only side left open being to the southeast. Lying 0.7m from U.1, off its unobstructed southeast side, is a stone block (U.7) that covers 1.7m northwest-southeast by 1.45. The rocks comprising Unit 7 are tightly packed together and form an uneven upper surface. A 'U-shaped' construction (U.10) is 0.53m southeast of U.7. Its walls are 0.15-0.3m thick by 0.12m high, the whole figure open to the northeast and covering 0.7m by 0.9m northeast-southwest. Unit 10's earthen-floored interior measures 0.4x0.6m, the gap in the northeast side covering 0.4m across.

Located 1.07m northwest of U.1 is a 0.23m-tall by 0.63m-wide stone wall (U.8). Unit 8 seems to mark the northwest edge of the earth surface fronting U.1 on this side. The northeast edge of that surface was apparently defined by U.3, a 0.23m-tall boulder that encompasses 0.59m northeast-southwest by 0.7m. A 0.32m-thick deposit of rocks adjoins and curls around U.3's southwest side (included in U.3). Unit 3 is 1.28m northeast of U.1. Another large rock (U.6) borders the Str. 53CO-Sub1 complex on the southwest. Unit 6 is 1.9m southwest of U.1 and measures 0.53m high by 0.44m thick, and 0.75m long northwest-southeast. Like U.1, U.6 is also triangular. Extending 1.6m northeast from U.6 is a rectangular block of stones that

encompasses 0.3m wide (U.4). Adjoining U.4 on the southeast is another stone block (U.5). Unit 5 is situated near U.4's center, is 0.75m long northeast-southwest by 0.4m wide.

All-in-all, Str. 53CO-Sub1 covers 5.3m northeast-southwest by 6.7m northwest-southeast, its constituent constructions oriented ca. 27 degrees. The complex focuses on a large central, triangular rock (U.1), one comparably sized boulder lying 1.28m northeast (U.3) and another 1.9m to the southwest (U.6) of the central element, the three stones forming a line. Unit 1 is hemmed in on all sides save the southeast by low rock lines that probably served to stabilize the central stone. A stone block measuring 1.45x1.7m and situated 0.7m southeast of U.1 may have served as a staging area for some activities associated with the focal boulder whereas stone lines lying northwest and southwest of U.1 may have functioned to partition the earthen-floored area that surrounds the central rock. The small 'U-shaped' construction, open to the northeast and with an earthen-floored interior that encompasses 0.24m<sup>2</sup>, might have been a support for a post. No other evidence for such a construction was noted here nor were other putative supports identified. All constructions pertaining to this complex were made using medium to (primarily) large river cobbles that are set in a mud mortar. It is not clear that placing the flatter faces of these rocks to look outwards was a major concern for the builders. In addition to four pottery sherds what might have been one piece of copper ore was found here.

### Time Span 3

Following Str. 53CO-Sub1's abandonment, a fine-textured, moderately soft-compacted, dark gray-brown humus horizon formed to a thickness of 0.07-0.2m atop S.2 and over much of the complex.

### *Suboperation 54CB*

Work in Subop. 54CB cleared 25m<sup>2</sup> in 2013 around a large rock that, based on its size, seemed out of place within the flat terrain lying 3.25m north of Str. 379 and 42.5m southwest of Str. 411. These investigations were designed to determine if the boulder that was the focus of excavations was purposefully placed in this position and, if so, what activities might have been conducted around it. Digging here reached a maximum depth of 0.74m below modern ground surface revealing one construction phase in the process.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.2, 3	-	
2	Str. 54CB-Sub1	U.1-5	-	F.1	TCL
3	-	-	S.1	-	

### Time Span 1

The earliest activity identified in Subop. 54CB was the deposition of at least 0.25m of a coffee-brown sandy clay that contains some well-rounded pebbles up to half a centimeter in

diameter (S.3; its base was not uncovered). Stratum 3 rose 0.23m over 4.85m from east-to-west.

Capping S.3 by 0.25-0.28m is a dark brown clay that contains a few small white inclusions (S.2). Stratum 2 apparently reached its full depth west of U.1 during TS.1. On the east, deposition of this soil may have resumed after Str. 54CB-Sub1 was abandoned. It seems, therefore, that Str. 54CB-Sub1's construction interrupted the accumulation of S.2 here.

### Time Span 2

The focus of Str. 54CB-Sub1 was a large boulder (U.1) that was 0.77m thick and encompassed 0.7m by 1.27m east-west. Unit 1's base is packed around with small to medium-size cobbles that are placed in such a way as to promote the boulder's stability. The positioning of a sizable rock (0.45m by 0.5m north-south) immediately west of U.1 may have served the same purpose (all of these surrounding rocks are included in U.1). Fronting U.1 on the east is a platform (U.2) composed of very large rocks (0.5x0.65m to 0.9x1m) set in three clear parallel lines running at 342 degrees. Unit 2 is one stone (0.3m) high, is embedded in a dark brown clay matrix, extends 1.6m east of U.1, and narrows west-to-east, from 4.2m to 1.7m northwest-southeast. A 0.25m-high stone-surfaced platform (U.3) extends 1.4m southeast of U.2, narrowing northwest-to-southeast from 2.1m to 1.5m across. Unit 3's southeast edge is oriented ca.23 degrees while its north and south margins run at angles of 121 and 107 degrees. In addition, a 0.5m-wide stone line set flush with ancient ground surface (U.4) was recorded running for 1.9m at an orientation of ca. 86 degrees east from its intersection with U.3's north junction with U.2. Lying 0.2m south of U.4's east end, another stone line set at ancient ground level (U.5) extends 1.1m south to join U.3's northeast face at the latter's east corner. Unit 5 measures 0.2m across and ends on the north in a boulder measuring 0.45m in diameter (included in U.5). Units 4, 5, and 3 thus formed an earthen-floored triangular space that encompasses 1.5m on the north (along U.4), 1.6m along U.3 on the southwest, and 1m along U.5 on the east. Finally, a solitary boulder (F.1), measuring 0.64x0.8m by 0.59m thick was found 1.32m west of U.1. Whether this large rock was part of the Str. 54CB-Sub1 complex or not is unclear. In all, Str. 54CB-Sub1 encompasses 4.7x4.7m (maximally).

While U.1-5 were all likely exposed and in use by the end of TS.2, there are hints that they were not all built at the same time. Unit 3 is not only oriented differently from U.2 but stones of the latter appear to encroach as much as 1m onto and over the former. In addition, U.1's base rests 0.1m above the U.3's top. Units 4, 5, and 3, in turn, are at the same level. Consequently, it appears that Str. 54CB-Sub1 started out as a construction in which a 0.25m-high stone block (U.3, possibly a bench) was fronted on the north by an earthen-floored triangular compartment. Subsequently U.1 was put in place to the west and bordered on the east by a platform made of substantial rocks (U.2). All TS.2 architecture was fashioned of river cobbles set in a mud mortar. The flatter faces of the stones comprising U.3-5 were directed outwards while no such care was lavished on the U.2 boulders which seem to have been chosen more for their sizes than for the vertical faces. The U.1's flatter aspects looks north. Very few artifacts were found here, one of them being a piece of copper slag.

### Time Span 3

Following Str. 54CB-Sub1's abandonment, as much as 0.15m of S.2 accumulated against U.2's east side, pinching out 1.1m to the east against U.3. As U.2 was set in a soil that was identical to S.2, it may be that this portion of the stratum represents material washing out from

that large-stone construction. Subsequently, a dark gray-brown, fine-textured humus horizon (S.1) formed to a thickness of 0.12-0.22m thick atop S.2. and over U.2.

### *Suboperation 54CM*

Suboperation 54CM was dug during 2013 on the northeast (1x1m) and southwest (1x1m) sides of a large rock (U.1) that was recorded on ground surface 3m southwest of Str. 411. Digging reached a maximum depth of 0.47m below modern ground level, exposing the boulder's full depth on its northeast and southwest sides.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3	-	
2	Str. 54CM-Sub1	U.1	-	-	TCL?
3	-	-	S.1, 2	-	

### Time Span 1

The first activity identified in these investigations was the laying down of at least 0.19m of a coffee-brown, sandy clay that contains gravel along with a few medium-size cobbles (S.3; its base was not uncovered). Stratum 3 ran flat for the 2m it was exposed running northeast-southwest. U.1 was set roughly 0.07m into this layer. The cobbles embedded in upper S.3 were concentrated on U.1's southwest flank where they were generally flat-laid and would have been visible at a level that is even with the top of S.3. They might have formed a surface extending at least 1m southwest of U.1. Whether or not this was a fortuitous outcome of the natural distribution of these rocks or if they were purposefully placed in these positions is unclear.

### Time Span 2

During this span U.1, a boulder encompassing 1.25m northeast-southwest by 0.9m by 0.65m thick, was put in place. At least one of the cobbles within S.3 and southwest of U.1 runs under that rock's southwest flank. It may be that U.1 arrived in this position due to natural processes but its great size and isolation would seem to make that scenario unlikely. It was probably placed here, maybe associated with a stone surface extending at least 1m to the southwest (see TS.1).

### Time Span 3

Stratum 3 was now covered by 0.2m of a dark brown clay that contains few inclusions (S.2). A fine-textured, dark gray-brown humus horizon (S.1) subsequently formed to a thickness of 0.07-0.1m atop S.2.

### *Structure 360*

Suboperation 54CQ was dug in 2013 against the northeast side of a large rock that is located in northern Op. 54, 13m south of Str. 361 and 30m west of Str. 411. This boulder was designated as part of Str. 360 during mapping of Op. 54. The trench exposed 9m<sup>2</sup> northeast of the aforementioned stone (U.1), excavations reaching a maximum depth of 0.26m below modern ground surface. One construction phase was identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	Str. 360-1 <sup>st</sup>	U.1-6	-	-	TCL
2	-	-	S.1	-	

### Time Span 1

The focal point of Str. 360-1st is a boulder (U.1), oval in shape with rounded edges, that measures 0.75m by 0.98m northeast-southwest and is 0.66m high. Unit 1 is fronted on the northeast by a pavement that is composed of three adjoining blocks of stones (U.2, 5, and 6) that are oriented approximately 310 degrees. Unit 2 borders U.1 immediately to the northeast and encompasses 0.3m by 1.4m northwest-southeast. Its neighbor immediately to the northeast (U.5) measures 0.43m by 1.7m northwest-southeast. The southeast ends of these two constructions form a straight line while on the northwest U.5 projects 0.3m past the northwest terminus of U.2. The last of the trio (U.6) measures 1m by 0.8m northeast southwest. Unit 6 continues the southeast line formed by U.2 and 5, intersecting the latter 0.7m southeast of its northwest end. In all, U.2, 5, and 6 form a level stone surface that extends 1.53m northeast of U.1 and generally narrows from southwest-to-northeast. Lying within 0.1m of U.6's east corner is another stone block (U.4). Unit 4 is aligned ca. 10 degrees and covers 0.9m north-south by 0.85-1.2m, narrowing from north-to-south as the construction's west side slants in northwest-southeast to join the figures south margin. Unit 3, a triangular stone block, is 0.5m north of U.4 and the same distance north of U.6. This construction measures 1.5m, 1.4m, and 1.2m on its northeast, south, and northwest sides, its slightly longer northeast flank being oriented roughly 311 degrees. The entire complex encompasses about 9m<sup>2</sup>, all constructions, save for U.1, having been fashioned primarily of small to medium cobbles set in a mud mortar.

### Time Span 2

Following Str. 360-1<sup>ST</sup>'s abandonment, a fine-textured, dark gray-brown humus level (S.1) formed to a thickness of at least 0.26m (its base was not encountered). Stratum 1 covered all but the uppermost parts of U.2-6 and left U.1 projecting 0.51m above modern ground surface.

### *Structure 361*

Suboperations 54CO and CP were dug during 2013 in the far north of Op.54 to expose three large rocks that were observed to define a line running northwest-southeast. This collection of stones was originally designated as Str. 361 during mapping of Op. 54. The rocks

are located 13m north of str. 360 (Subop. 54CQ) and 32m northwest of Str. 411. Excavations here cleared 14m<sup>2</sup>, reaching a maximum depth of 0.44m below modern ground surface. One major building effort was identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3	-	
2	Str. 361-1 <sup>st</sup>	U.1-7	-	-	TCL
3	-	-	S.1, 2	-	

### Time Span 1

The earliest activity for which there is evidence in Subop. 54CO/CP is the deposition of at least 0.21m of a soft-compacted, coffee-brown, sandy soil that contains numerous rounded pebbles along with a few medium-size rocks (S.3). Stratum 3 was observed to rise 0.07m over 0.92m from northeast-to-southwest in the only area it was exposed, 1.4m southwest of U.2.

### Time Span 2

Units 1-3 are three boulders that are set in a line that is very approximately aligned 338 degrees. Unit 3, the northwestern-most rock, is 0.33m distant from U.2. The latter, in turn, lies 0.87m northwest from U.1 on the far southeast end of the line. These large stones measure: 0.92m by 0.75m by 0.57m thick (U.1); 0.64m by 0.65m by 0.61m thick (U.2); and, 0.7m by 0.6m by 0.45m thick (U.3). Each of the boulders is packed around with medium-size cobbles that were apparently designed to enhance the rocks' stability. A 0.2m-tall by 0.48m-wide wall (U.7) lies 0.39m east of U.3. Running at an angle of 356 degrees for at least 1.25m, U.7 might have been built to delimit the east side of the Str. 361-1st complex. As this wall's north and south ends were not uncovered, we cannot say whether it delimited the entirety of the aggregate's east flank.

The other major construction uncovered here is 0.3m west of U.2. This entity (U.6) seems to have been a stone surface that covers 3.8m northeast-southwest by 2.5m and is oriented roughly 53 degrees. Unit 6's east and south corners are inset 0.3x0.4m (east) and 0.15x0.3m (south). Built into U.6's south corner is an elevated stone block (U.5) that encompasses 0.41m by 0.7m northwest-southeast and stands 0.3m-high. A comparable construction (U.4) is located in U.6's east corner. This construction covers 0.8m by 1.25m northeast-southwest and is about 0.3m tall. Unit 4 overlaps U.6's southeast edge, extending 0.3m beyond that line to the southeast. Unit 5, in contrast, is completely contained with U.6's south corner, defining the northeast side of the aforementioned inset.

The entire complex as it was exposed in these investigations covers an estimated 16m<sup>2</sup>. All constructions raised now were made primarily of medium-size cobbles that are set in a mud mortar. There are no clear signs that these rocks were chosen for their flat faces or that these aspects of the stones were consistently directed outwards.

### Time Span 3

Following Str. 361-1<sup>st</sup>'s abandonment, 0.12-0.2m of a dark brown, fine-textured clay (S.2) was laid down atop S.3 and over the lower portions of this construction. Next, a fine-textured, dark gray-brown humus level (S.1) formed to a thickness of 0.07m-0.2m atop S.2 and blanketed most of the Str. 361-1<sup>st</sup> complex.

### *Suboperation 54CS*

Suboperation 54CS was a 1m by 3.66m trench, oriented 190 degrees. that was dug in 2013 to expose the north and south sides of a large triangular rock located 37m west of Subop. 54CB and 15m south/southeast of the steps exposed in Subop. 54CR (Described in the Test Pits section). Excavations here were pursued to a maximum depth of 0.41m below modern ground surface, one construction stage being identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3	-	
2	Str. 54CS-Sub1	U.1, 2	-	F.1	TCL
3	-	-	S.1, 2	-	

### Time Span 1

The earliest activity identified in the course of digging within Subop. 54CS was the deposition of a coffee-brown, fine-textured clay (S.3). Only the very top of S.3 was revealed 1.6m north of the central rock (U.1).

### Time Span 2

The focal point of Str. 54CS-Sub1 is a triangular rock (U.1) that measures 0.8m north-south by 1.5m east-west and 0.58m tall. Unit 1's flattest faces look north and south. Located 0.75m north of this boulder, and separated from it by earth, is a stone surface (U.2) that rests on S.3 and measures 0.8m north-south by about one stone thick (0.1m). Unit 2's top is equal to the base of U.1 and is aligned roughly 272 degrees. Another rock level (F.1) abuts U.1 on the south and runs for at least 0.9m further in that direction at which point it leaves the excavation. Feature 1 intersects U.1 at a point roughly 0.17m above the latter's base. As the 'feature' designation implies, the cultural origins of this stone deposit were not clear. The east and west extents of U.2 and F.1 were not determined.

### Time Span 3

After Str. 54CS-Sub1 was abandoned, S.3, U.2, and the lower 0.2m of U.1 on the north were covered by a dark brown clay with few inclusions (S.2). Stratum 2 was not identified south

of U.1. Subsequently, 0.1-0.12m of a fine-textured, dark gray-brown humus horizon (S.1) formed atop S.2 and covered F.1.

## Test Pits: Op 53 and 54

### *Suboperation 53CB*

Suboperation 53CB is a trench that measures 5m long east west (oriented ca. 80 degrees) by 1m and was dug in 2013. The excavation was expanded 1m<sup>2</sup> north and south of U.1 to reveal the full length of U.1. Located 27.5m southwest of Str. 368 and 2.5m north of the seasonal watercourse that borders Op. 53 on the south, the only architecture noted on the surface consists of the remains of what seemed to be a stone wall (U.1). Suboperation 53CB was dug in 2013 to expose this construction, date its use, and assess what relation it might have had to copper processing. The putative wall's proximity to Str. 372, 5m to the northwest, suggested that such an association with metallurgy was possible. Overall, 7m<sup>2</sup> were cleared in the course of this work, digging reaching a maximum depth of 0.51m below modern ground surface.

### Time Spans

Time Span	Construction Phase	Units	Strata	Features	Date
1	-	-	S.3	F.2	TCL
2	-	-	S.2	-	TCL
3	Str. 53-Sub1	U.1	-	-	Historic?
4	-	-	S.1	F.1	

### Time Span 1

The earliest activity attested to within Subop. 53CB was the deposition of at least 0.26m of a moderately hard-compacted, fine-textured, brown clay that contains numerous small to medium-size river-worn stones (S.3). Stratum 3 runs more-or-less flat for 1.8m east from the west trench margin before ascending 0.06m over 0.54m from west-to-east. At this point S.3 disappeared beneath U.1. When it emerged 0.8m to the east from underneath that construction, its top was 0.03m lower than its last recorded elevation west of U.1. It then drops 0.23m across 0.73m west-to-east, disappearing in the base of excavation. It appears that S.3's west-to-east decent east of U.1 defines the west side of a declivity (F.2) the full depth and dimensions of which we did not determine. Given the proximity of Subop. 53CB to the southern swale, the aforementioned slope was probably cut by either an earlier course of the *quebrada* or a tributary of that watercourse. Some artifacts, including pieces of copper slag, were found in these deposits.

### Time Span 2

Stratum 3 and F.2 were subsequently covered by a moderately hard-compacted, fine-textured, brown clay (S.2) that was identical to S.3 save for the general absence of stone in the

former. Stratum 2 blankets S.3 by 0.14-0.21m west of U.1 while at least 0.44m of this earth accumulated within F.2 during this interval (S.2's base in the depression was not identified). The upper surface of S.2 runs flat over the extent it was exposed in Subop. 53CB. Artifacts, including fragments of copper slag, were retrieved from S.2

### Time Span 3

Unit 1 is a wall that stands as much as 0.53m tall and measures 1.07m across east-west by 2.2m long over which distance it was aligned roughly 23 degrees. It is not connected to any other surviving architecture and seems to have been free-standing. At its deepest, U.1 projects 0.14m down into S.2, extending 0.05m below the top of S.3. A change in construction noted within U.1 tentatively suggests that it reached its full width in two stages. During the initial period, it encompassed 0.55m east-west. Subsequently, its width was almost doubled by the appending of a 0.52m segment to its west face. The wall's western flank was less well preserved than its eastern counterpart, though whether this has anything to do with the lateness of the western addition or to processes of differential weathering is unclear. Unit 1 may also have been expanded 0.76m to the north at some point, an interpretation that is again suggested by a change in construction at this point in the wall.

Unit 1 was made primarily of river cobbles, though a large soft, white stone (possibly limestone) was used to create the wall's northeast corner. Little effort was invested in directing the flatter faces of these rocks outward. All of the stones are set in a mud mortar.

Historic period cultural materials, including a fragment of an iron artifact, were mixed with prehistoric remains within S.2 in the environs of U.1. This makes dating the wall's construction and use difficult. The shallowness of U.1 and the several Historic (probably 19<sup>th</sup> or early 20<sup>th</sup> century) artifacts, found here tentatively point to its raising during relatively recent times.

### Time Span 4

After U.1's abandonment, 0.06-0.09m of a moderately soft-compacted, fine-textured, dark brown humus formed atop S.2. The upper 0.25m of U.1 was still visible above the modern ground surface that formed atop S.1. A very few rocks (F.1) that likely fell from U.1 were recorded adjoining the construction. The paucity of these rocks suggests that U.1 was never much higher than it appeared on excavation.

### *Suboperation 53CD*

This 1x1m test pit was dug during 2013 at a point 3.5m north of the seasonal channel that runs along Op. 53's south side and 3.8m west of Subop. 53CB. This probe was dug as part of an effort to test for debris associated with copper processing that might have been jettisoned from portions of the workshop, such as Str. 372, 2m to the north, where smelting had been identified during the 2004 field season. Digging here reached a maximum depth of 0.72m below modern ground surface at which point a culturally sterile layer containing a dense concentration of rocks (S.3) was encountered. While some detritus from copper working, especially slag, was retrieved from Subop. 53CD, it was not found in quantities large enough to warrant the area's identification as a purposeful trash dump.

### Time Spans

<u>Time Span</u>	<u>Construction-1st Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3	-	-
2	-	-	S.2	-	TCL
3	-	-	S.1	-	-

### Time Span 1

The earliest event identified within Subop. 53CD was the deposition of at least 0.17m of a moderately fine-textured, hard-compacted, dark gray-brown clay that contains a great many small (0.01m or less in diameter) river-rounded pebbles intermixed with medium to large cobbles (S.3, its base was not encountered). This culturally sterile deposit ran relatively flat in all directions over the 1m it was exposed. Stratum 3 likely derives from a significant period of widespread flooding in this area.

### Time Span 2

Stratum 2 was covered by 0.4m of a fine-textured, soft-compacted, light brown clay that contained a few river-worn pebbles scattered throughout it (S.2). Stratum 2's upper surface was relatively level in all directions. The artifacts, including pieces of slag, recovered from the deposit indicate that it was during TS.2 that copper working was being pursued in the immediate area. The materials are so dispersed, however, that they seem to represent debris that was scattered over this part of Op. 53 and not concentrated purposefully in a trash dump.

### Time Span 3

It was during this interval that a moderately fine-textured, soft-compacted, dark gray-brown humus horizon (S.1) formed to a thickness of 0.12-0.17m atop S.2. Many small (0.01m or less in diameter) river-rounded pebbles were recovered from this humus level.

### *Suboperation 53CE*

Suboperation 53CE is located 2.5m northeast of Subop. 53CB and an equal distance north of the seasonal watercourse that defines Op. 53's southern limits. Work here began during the 2013 field season in a 1x1m test pit set in an area that yielded a relatively large number of artifacts on the surface. This work was ultimately expanded into a trench measuring 1m by 5.06m east-west, digging reaching a maximum depth of 0.8m below modern ground surface. The density of cultural material was greatest within the area of the original test pit and a 1x1m extension of it to the east. As digging proceeded to the west for 3.06m the frequency of artifacts declined. Part of what drove the westward expansion of Subop. 53CE was the suspicion that excavations here had uncovered a stone floor at a depth of 0.31-0.44m below modern ground surface. In following out that putative surface and digging below it, we became convinced that what we took to be a human creation was the uppermost segment of a natural deposit of stones (S.4). No cultural features were identified in the course of this work. Rather, Subop. 53CE confirmed what we had seen on modern ground surface; a localized but vaguely

defined concentration of cultural remains that likely resulted from informal practices of trash disposal.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.4	-	-
2	-	-	S.2, 3	-	TCL
3	-	-	S.1	-	-

### Time Span 1

The earliest event identified within Subop. 53CE was the deposition of at least 0.22m of a softly compacted, brown, sandy soil that contains large numbers of small (mostly) to large rocks throughout its exposed extent (S.4). Most of the stones embedded in S.4 appear to have been rounded through river action. The layer rises 0.24m east-to-west over the 5.06m it was exposed. Digging within S.4 did not yield any signs of human activity while this layer was accumulating.

### Time Span 2

Stratum 4 was covered by 0.04-0.19m of a hard-compacted, fine-textured, brown clay (S.3). Stratum 3 was traced for 3.9m west of the trench's east wall at which point it pinches out against the top of S.4. Covering S.3 and S.4 over the latter's westernmost exposed 1.16m is a moderately hard-compacted, fine-textured brown clay (S.2) that is distinguished from S.3 by its possession of a few scattered rocks. Stratum 2 is 0.11-0.28m thick. Both S.2 and 3 retained generally level upper surfaces and contained cultural material. Strata 2 and 3 in the easternmost 2m<sup>2</sup> of Subop. 53CE had relatively high densities of artifacts (277 pieces/m<sup>3</sup>; 0.8m<sup>3</sup> excavated) including pieces of copper slag. No formal limits to this concentration, such as might be represented by a pit outline, were noted. Still, it appears that this trench encountered a portion of an informal trash dump, materials jettisoned here having originally resulted from activities conducted in the southernmost portion of El Coyote.

### Time Span 3

A 0.12-0.16m-thick soft-compacted, fine-textured, brown humus horizon (S.1) formed atop S.2 during this, the final time period recognized within Subop. 53CE. Only a few, scattered small rocks were noted within S.1, not enough to qualify as a feature or to constitute debris fallen from a nearby construction.

### *Suboperation 53CF*

Suboperation 53CF is a 1x1m test pit that was dug 2m east of Subop. 53CH, 4.5m southwest of Subop. 53CJ, 5m southwest of Str. 372, and 5m north of the swale that runs along Op. 53's south edge. Excavations within Subop. 53CF reached a maximum depth of 0.6m below

modern ground surface. As with Subop. 53CD, CH, and CJ, Subop. 53CF was dug to test for the existence of debris that might have been jettisoned here from copper processing conducted in Str. 371, 372, and 376 to the north. The very dense concentration of slag recovered in the upper 0.2m of the trench suggests that we did encounter an area where detritus from copper working was tossed. There was no sign of a pit or other receptacle into which the dross was dumped and it may be that the practice was to leave debris neat the southern wash in anticipation of it being swept away during heavy rains.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3	-	-
2	-	-	S.2, 4	-	TCL
3	-	-	S.1	-	

### Time Span 1

The earliest event recognized within Subop. 53CF was the deposition of numerous river-worn rocks (S.3). Excavations ceased when we encountered this layer, which ran relatively flat across the 1m it was exposed. Most likely, S.3 is a particular example of the stone deposit which underlies much of southern Op. 53, probably resulting from a significant flood that inundated this area prior to the initiation of recorded human habitation here.

### Time Span 2

Stratum 3 was covered now by 0.27-0.4m of a fine-textured, hard-compacted, brown clay (S.2). What seems to be an upward extension of S.3, composed of densely packed small to large rocks, was noted in Subop. 53CF's south wall. These rocks project 0.35m up into S.2. A comparable pattern was not recorded in the test pit's east wall. Here a 0.09m-thick lens (S.4) composed of a moderately fine-textured, moderately soft-compacted, brown sand extends 0.68m south from the north excavation wall at which point it pinches out. Stratum 4 contains a moderately dense concentration of small, rounded rocks. A few pieces of slag were recovered from S.2, many fewer than were recorded within S.1.

### Time Span 3

During this interval, 0.14-0.2m of a moderately hard-compacted, moderately fine-textured, dark gray-brown humus horizon (S.1) formed atop S.2. Largely devoid of rocks, S.1 was distinguished by the dense concentration of slag found within it. Fully 22.2kg of this debris was recovered from 0.2m<sup>3</sup>, there being more slag than soil in this area.

### *Suboperation 53CG*

This 1m by 4.08m-long (north-south) trench was dug during 2013 at a point 8m northeast of Subop. 53CK, 5m west of Str. 414, and 4m north of the seasonal watercourse that borders Op. 53 on the south. These investigations were pursued as part of the test-pitting

program along the southern swale's north margin to search for the presence of activities in this area that might have been related to copper processing. Digging reached a maximum depth of 0.64m below modern ground surface. No signs of ancient activities or architecture were detected here.

Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3	-	
2	-	-	S.1, 2	-	TCL

Time Span 1

The first activity identified in Subop. 54CG was the deposition of at least 0.42m of a soft-compacted, moderately fine-textured, brown clay that contains large numbers of small to medium-size cobbles (S.3; its base was not exposed). Stratum 3 rose 0.2m from north-to-south over the 4.08m it was exposed running north-south within Subop. 53CG. This layer likely resulted from an episode of intense flooding. No artifacts were recovered from S.3.

Time Span 2

It was at this time that 0.08-0.15m of a moderately hard-compacted, fine-textured, brown clay (S.2) was laid down atop S.3. Stratum 2 is largely free of stones. The last event noted in the course of these investigations was the gradual formation of a 0.12-0.14m-thick humus level composed of a moderately soft-compacted, fine-textured, dark gray brown soil (S.1) atop S.2. A few artifacts, including pieces of copper slag, were recovered from these levels.

*Suboperation 53 CH*

This 1x1m test out is the westernmost member of the probes that are strung out over 16.5m east-west from Subop. 53CD on the east. As in each of the four pits included in this line (the others being Subop. 53CD, CF, and CJ), we were looking for dumping sites for detritus from copper working which was attested to as close as Str. 372, 12.5m to the northeast. No clear signs of a debris pile were located here.

Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.4	-	-
2	-	-	S.3	-	
3	-	-	S.2	-	

4 - - S.1 -

### Time Span 1

A dense layer of river-rounded rocks (S.4) was laid down now. This stratum runs more-or-less flat over its exposed extent. As S.4 closely resembled culturally sterile deposits that were identified as underlying human occupation elsewhere in Op. 53, excavations did not proceed deeper than the uppermost 0.06m of S.4.

### Time Span 2

Stratum 4 was now blanketed by 0.15-0.2m of a moderately hard-compacted, fine-textured, brown clay (S.3). Stratum 3 contains fewer rocks than S.4 and was observed to rise 0.1m over 1m north-to-south. No artifacts were retrieved from this layer.

### Time Span 3

A moderately soft-compacted, fine-textured, brown clay that contains numerous small to large cobbles (S.2) covers S.3 by 0.14-0.18m. The density of rocks here is less than that noted in S.4 and, like S.3, S.2 ascends 0.1m over 1m north-to-south. Stratum 2 may be the remnants of a significant, if highly localized, flooding episode. Stratum 2 appears to have been culturally sterile.

### Time Span 4

A moderately hard-compacted, fine-textured, dark gray-brown humus horizon (S.1) formed to a thickness of 0.16-0.25m atop S.2 during this span. Very few stones were found in S.1 and the ground surface that marks the layer's upper limit is flat and does not replicate the north-to-south rises of S.2 and 3. A few artifacts, including three pieces of copper slag, were found in S.1.

### *Suboperation 53CJ*

Suboperation 53CJ is a 1x1m test pit that was dug during 2013 at a point 2.5m west of Subop. 53CD, 4.5m northeast of Subop. CF, and 3.5m north of the seasonal watercourse that borders Op. 53 on the south. Dug in search of evidence for past activities that might have been pursued on Op. 53's southern margin, excavations here reached a maximum depth of 0.93m below modern ground surface.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3, 5	-	-
2	-	-	S.2, 4	-	TCL?

3 - - S.1 - - TCL

Time Span 1

The earliest event chronicled within Subop. 53CJ is the laying down of at least 0.24m of a hard-compacted, moderately coarse-textured, tan sand that contains numerous small to medium-size cobbles, the latter becoming more common with greater depth (S.3; its base was not identified). Stratum 3’s upper surface was relatively flat over the 1m it was exposed. As was the case where a similar material was identified elsewhere in Op. 53, S.3 likely derived from an intense period of flooding. A lens composed of a hard-compacted, fine-textured, brown clay (S.5) extends 0.76m from the east excavation wall, resting directly atop S.3. Stratum 5 is maximally 0.24m thick at the point where it leaves the test pit, pinching out against S.3 on the west. These deposits were culturally sterile.

Time Span 2

Strata 3 and 5 were now covered by 0.3-0.56m of a moderately hard-compacted, fine-textured, brown clay (S.2) that contains only a few scatted rocks. Stratum 2 retains a level upper surface in the area it was observed in Subop. 53CJ and contains a 0.02-0.05m-thick lens of brown clay that is distinguished by the inclusion of numerous small (0.01m or less in diameter) pebbles in it (S.4). Stratum 4 is 0.22m below the top of S.2 and runs for 0.42m north-south over which distance it is relatively flat. A few pieces of copper slag were recovered from these deposits.

Time Span 3

The last process identified in Subop. 53CJ was the formation of a moderately soft-compacted, fine-textured, dark gray-brown humus (S.1) atop S.2. Fully 5.5kg of copper slag was retrieved from S.1 (0.2m<sup>3</sup>).

*Suboperation 53CK*

Suboperation 53CK is a test pit that measured 1m on a side and was located 6m northeast of Subop. 53CE, 8m southwest of Subop. 53CG, and 4m north of the seasonal stream that borders Op. 53 on the south. Excavated during the 2013 field season, Subop. 53CK was intended to test whether the trash deposit identified in Subop. 53CE continued this far to the northeast. Digging reached a maximum depth of 0.93m below modern ground surface. No constructions were recorded nor did we find cultural materials in sufficient densities to suggest that they were part of the Subop. 53CE trash deposit.

Time Spans

Time	Construction				
Span	Phase	Units	Strata	Features	Date
1	-	-	S.7, 8	-	-
2	-	-	S.5, 6	-	TCL

3	-	-	S.4	-	TCL
4	-	-	S.3	-	TCL
5	-	-	S.2	-	TCL
6	-	-	S.1	-	TCL

#### Time Span 1

The earliest event identified within Subop, 53CK was the laying down of at least 0.26m of a hard-compacted, fine-textured, red-brown clay that contains a few small white flecks (S.8). Several small to medium-size rocks are embedded in S.8 while that layer's upper surface runs more-or-less flat over the 1m it was exposed east-west and north-south. A 0.08-0.1m-thick lens of brown sandy soil and a few small rocks (S.7) were noted in the south excavation wall. Stratum 7 extends 0.86m east from the west excavation wall, its top coterminous with the S.6/8 interface. The basal rock layer identified in other parts of Op. 53 was not reached here. No cultural materials were found in these layers.

#### Time Span 2

Strata 7 and 8 were covered by as much as 0.24m of a dark brown clay that is marked by the inclusion of carbon flecks throughout its exposed extent (S.6). A dark yellow-brown sandy soil (S.5) comprises a lens that is 0.08m thick and extends 0.68m east from the west excavation limits. As with S.7, S.5 was only noted in the south wall of Subop. 53CK, its top equal to that of S.6 elsewhere in the excavation. Stratum 6's top runs flat east-west within the 1x1m pit and drops 0.1m over 1m from south-to-north. Artifacts, including some copper slag, were recovered from these soils.

#### Time Span 3

Stratum 4, a brown sandy soil that contains a few small rocks, blankets S. 6 and 5 by 0.07-0.12m. This layer's upper surface parallels that of its predecessor, running flat east-west and dropping from south-to-north, in this case descending 0.12m over 1m in that direction. Some pieces of copper slag along with other artifacts were retrieved from S.4.

#### Time Span 4

Fully 0.21-0.33m of a fine-textured, soft-compacted, very dark brown clay (S.3) now accumulated atop S.4. Unlike its immediate antecedents, S.3 maintained a level upper surface in all directions. The soft compaction of the layer may have to do with disturbances to S.3 caused by natural processes. What may have been the remains of a decayed root or animal burrow were recorded at the S.3/4 interface in Subop. 53CK's southeast corner. This disrupted area, characterized by fine-textured, dark brown, very soft-compacted earth in which were mixed carbon flecks and some animal bones, was 0.18m high and extended 0.32m and 0.27m west and north of the excavation's southeast corner. These disruptions may account for the mixing of prehistoric and historic period artifacts, including ceramic furnace pieces, within S.3.

#### Time Span 5

A layer (S.2) composed of a fine-textured, soft-compacted, brown clay with no notable inclusions covers S.3 by 0.06-0.1m. Stratum 2 retains a flat upper surface over its exposed extent.

### Time Span 6

A soft-compacted, fine-textured, dark brown humus horizon (S.1) developed atop S.2 to a thickness of 0.03-0.05m. This marks the last event chronicled in Subop. 53CK.

### *Suboperation 53CL*

Suboperation 53 CL was dug in 2013 at a place where artifacts were found concentrated on ground surface. As such surface scatters are rare in Op. 53, it was thought that this one warranted attention. The trench measures 1m by 2.17m northeast-southwest and is 17.5m northeast of Subop, 53CI and 15m northwest of Str. 413. Excavations here reached a maximum depth of 1.4m below modern ground surface, artifacts being retrieved from throughout this depth.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.11	-	TCL
2	-	-	S.10	-	TCL
3	-	-	S.8, 9	-	TCL
4	-	-	S.6, 7	-	TCL
5	-	-	-	F.1	TCL
6	-	-	S.4, 5	-	TCL
7	-	-	S.2, 3	-	TCL
8	-	-	S.1	-	TCL

### Time Span 1

The earliest activity for which there is evidence in Subop. 53CL is the deposition of at least 0.29m of a very hard-compacted, fine textured, dark brown clay in which are embedded a few small white inclusions (S.11; its base was not encountered). Stratum 11 ascends gradually 0.2m over 2.17m from southwest-to-northeast.

### Time Span 2

Stratum 11 was now covered by 0.1-0.13m of a medium brown silt in which numerous, mostly angular, small rocks that are no more than 0.03x0.04m in size are embedded (S.10). Stratum 10 follows the southwest-to-northeast ascent described for S.11, in this case rising 0.17m across 2.17m in this direction.

### Time Span 3

During this interval, 0.16-0.27m of medium-brown, fine-textured sandy silt (S.9) collected atop S.10. A few medium size cobbles were included in S.9, several lying flat at the layer's interface with S.10. Stratum 9 rises 0.22m across 1.6m from southwest-to-northeast at which point it flattens out for the remaining 0.57m it was exposed to the northeast. It is over this level portion of S.9 that a hard-compacted, sandy clay that contains rocks as large as 0.06x0.04x0.02m. This lens is maximally 0.15m thick where it enters the trench from the northeast, pinching out against S.9 at a point 0.57m southwest of the excavation's northeast margin. The upper surface of S.8 continues the upward slope of S.9, rising 0.16m across 0.57m from southwest-to-northeast.

#### Time Span 4

It was at this time that two distinct soil levels were laid down on top of S.8 and 9. Stratum 6, a light brown clay that contains a high concentration of sand and pebbles up to 8mm in diameter, accumulated to a thickness of 0.38m on top of S.9 in the southwestern-most 0.9m of Subop. 53CL. The upper surface of this layer runs flat over its exposed extent. Among the few artifacts found in S.6 was some copper slag. On the northeast, a hard-compacted brown clay that contains moderate concentrations of sand (S.7) was laid down to thicknesses of 0.12-0.26m over S.8 and 9. Stratum 7 ascends 0.13m over the 0.83m it was observed running southwest-to-northeast. The junction between S.6 and 7 was obliterated by the digging of F.1 in TS.5. Two pieces of copper slag derived from S.4.

#### Time Span 5

Feature 1 is a pit that measures 0.46m in diameter by 0.3-0.37m deep (it is slightly shallower on its upslope northeast flank). It was found in the approximate middle of Subop. 53CL. Feature 1's base is flat, sloping up 0.07m from southwest-to-northeast (riding atop S.9), its southwest and northeast walls being nearly vertical. The former drops 0.38m over 0.12m in horizontal distance, the northeast flank descending 0.3m across 0.07m. Feature 1 was eventually filled with a brown, coarse-textured sand that contains pebbles up to 7mm in diameter. No artifacts were found specifically associated with F.1.

#### Time Span 6

A brown clay that incorporates fine sand to small pebbles (S.4) now accumulated to depths of 0.05-0.29m over S.6, 7, and F.1. Stratum 4's base rides the southwest-to-northwest ascent defined by S.6 and 7 while its upper surface drops very gradually, 0.1m over 2.17 in that direction. A few pieces of copper slag were found in S.4. A maximally 0.2m-thick lens of light brown sandy silt lacking in pebbles (S.5) projects 0.73m northeast from the trench's southwest edge. Stratum 5 rests on S.6 and is otherwise covered by S.4.

#### Time Span 7

A hard-compacted, fine-textured, brown clay (S.2) was deposited in depths of 0.11-0.14m over S.4 during this span. Stratum 2 extends 1.6m northeast from Subop. 53CL's southwest margin at which point it is replaced by a dark reddish-brown clay that contains subangular pebbles measuring up to 8mm across (S.3). Stratum 3 was observed for 0.57m running to the

northeast at which point it left our excavations. Stratum 3 rests on S.4, S.2 and 3 together maintaining a relatively flat upper surface across the trench's full southwest-northeast extent.

### Time Span 8

A fine-textured, moderately soft-compacted, dark gray-brown humus horizon (S.1) now formed to depths of 0.09-0.14m atop S.2 and 3.

### *Suboperation 54CR*

Suboperation 54CR was dug during 2013 at the base of the steep ascent to the high river terrace that supports the Southeast Group. Surface evidence hinted that there might have been a staircase that ascended this slope, terminating at a point 15m north of Str. 54CS-Sub1 and 32m southwest of Str. 360. Structure 411 is 60m to the northeast. Excavations here uncovered 6m<sup>2</sup>, digging reaching a maximum depth of 0.56m below modern ground surface. One construction phase was identified in the course of this work.

### Time Spans

<u>Time Span</u>	<u>Construction Phase</u>	<u>Units</u>	<u>Strata</u>	<u>Features</u>	<u>Date</u>
1	-	-	S.3, 4	-	TCL?
2	Str. 54CR-Sub1	U.1-4	-	-	TCL
3	-	-	S.1, 2	-	

### Time Span 1

The earliest event chronicled within Subop. 54CR was the deposition of two distinct soils (S.3 and 4). The latter, a coffee-brown clay, was exposed to a maximum thickness of 0.09m southeast of and below TS.2 construction (U.3). Stratum 4 runs flat for the 1.35m it was observed running northwest-southeast. Stratum 3, a yellow-brown sandy clay that contains numerous rocks measuring up to 0.04m across, replaces S.4 in the immediate environs of U.1-4. Uncovered to a maximum thickness of 0.17m (its base was not exposed), this earth rises 0.08m over 0.2m from southeast-to-northwest directly below U.2 and ascends in a comparable manner beneath U.3 and 4. It may be that S.3 was introduced as fill to support the basal elements of Str. 54CR-Sub1's construction.

### Time Span 2

The exposed portion of Str. 54CR-Sub1 consists of a 0.48m-high stone riser (U.3) that runs for at least 3m at an angle of ca. 33 degrees. Unit 3 steps back (northwest) 0.6m on the southwest; whether this was also the case on the northeast is unclear. Near U.3's center is a 0.27m-high stone outset (U.4) that projects 0.55m to the southeast and measures 0.4m across northeast-southwest. Unit 3 is flanked on the northeast and southwest by boulders (U.1 and 2). Unit 1 on the northeast covers 1m by 2m northwest-southeast and presents a flat face to the

southeast. Unit 2 on the southwest is an oval that covers 1m by 1.55m northeast-southwest by 1.9m high.

In general, what we glossed as Str. 54CR-Sub1 may be the basal step in a staircase that leads upslope to the Southeast Group. That putative set of steps was seemingly flanked at its base by two massive stones that are analogous in their sizes to those recorded in Subop. 54CB, CM, CS, and Strs. 360 and 361. A test excavation conducted during 2013 in a low platform (Str. 415, Subop. 50CA) upslope and 15m northeast of where the Subop. 54CR-Sub1 steps were thought to terminate, provided strong evidence that the structure was built and occupied during the Terminal Classic. This evidence tentatively suggests that Subop. 54CR-Sub1 also dates to the same interval.

All constructions raised during TS.2 were fashioned primarily of medium-size cobbles the flatter aspects of which were directed outwards. The rocks are set in a mud mortar.

### Time Span 3

Following Str. 54CR-Sub1's abandonment, 0.22-0.29m of a dark brown, fine-textured clay (S.2) was laid down over S.4 and the lower portions of U.1-4. Subsequently, a fine-textured, dark gray-brown humus (S.1) formed atop S.2 to a thickness of 0.06-0.1m.

### **Test Pits on the Grid**

A grid spanning Op. 53 and 54 was established and 94 test pits, each measuring 0.5x0.5m, were dug across this lattice in 2013 to identify activity areas that were not visible on ground surface and that were not associated with visible architecture. They were also designed to define the limits of the copper workshop based on changes in the chemical composition of soil samples obtained from the pits, especially variations in the levels of copper residue they contained. The soil analyses were conducted by A. Shugar. Figure 1 indicates the form and distribution of the grid while Figure 2 summarizes the different levels of copper traces identified in soils collected from the grid and other excavations conducted in Op. 53 and 54.

**EL COYOTE**  
Sta Barbara, Honduras  
**SOUTHEAST GROUP**

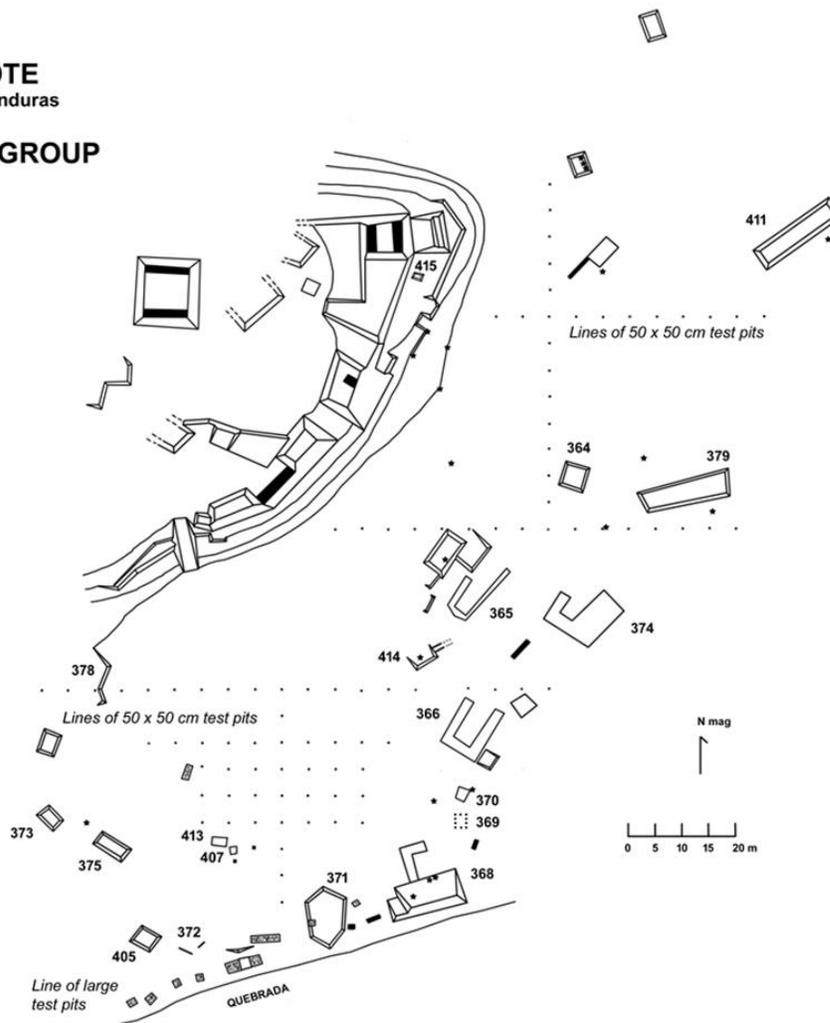


Figure 1 Map of Op. 53 and 54 at the site of El Coyote showing the relation of the test grid with constructions recorded on this portion of the lower river terrace. Note that the structures in the northwest corner of the figure are part of the Southeast Group mentioned in the text.

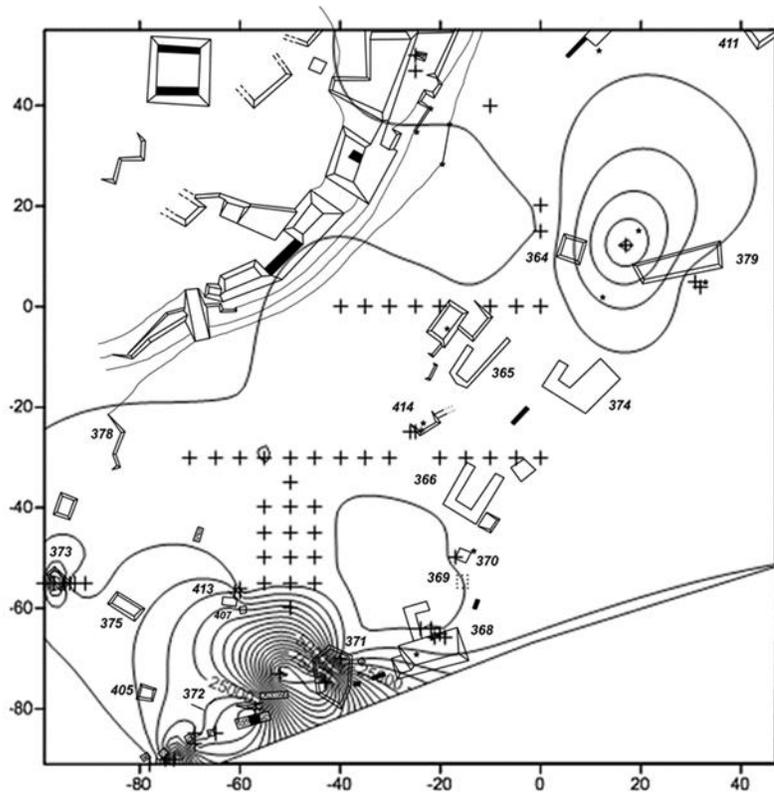


Figure 2 Map showing variations in the concentrations of copper residue recorded from soil samples recovered during excavations in Op. 53 and 54 during the 2013 field season. This figure is provided by Aaron Shugar and is based on his analyses of the relevant samples.

The vast majority of the 94 test pits excavated on the grid produced no clear signs of cultural activities. Artifacts, primarily pottery sherds, were primarily recovered from tests dug within an area encompassing 35m east-west by 45m within Op. 53, west of Str. 414, north of Str. 372, and west of Str. 373. Many fewer cultural remains were encountered in Op. 54 within the northern part of the terrace. The latter artifacts were primarily retrieved from tests dug within an area measuring 10m by 20m north-south, situated 10m northeast of the possible staircase identified in Subop. 54CR and an equal distance southwest of Str. 360 (Op. 54CQ).

The highest concentrations of copper residues were noted in soils found in the area that encompasses Strs. 371, 413, 372, and 373 in the southwestern portion of Op. 53. This is also the zone where detritus from metallurgy and tools used in its pursuit were primarily found in the test pits. An exception to this pattern is an isolated spike in copper traces within soil samples recovered near Structure 379 in Op. 54 on the north-central part of the terrace. This concentration suggests that copper working also occurred here, albeit on a modest scale. Overall, these findings confirm inferences based on other lines of evidence that metallurgy was primarily practiced in the 2,700m<sup>2</sup> that constitutes the western half of Op. 53.

## General Summary

The strongest evidence for copper working comes from the southwest corner of the low terrace, within the western portion of Op. 53. Here there are indications for how copper was being processed up to the point of casting finished artifacts. The initial separation of copper from the rocks in which it was embedded occurred at Structure 407. The four boulders found here were apparently used as anvils on which copper-bearing ores were broken and beneficiated (i.e., removing unwanted gauge [waste material] and increasing the total copper ratio in the rocks). Subsequently, the ore was smelted at Str. 372-1<sup>st</sup>, 376-1<sup>st</sup>, and, possibly, Str. 413, 373-Sub 4 and -Sub3, and F.1 in Str. 371. The steps in this process are most clearly seen at the first building. Here a low stone platform served as a work station where copper-bearing rocks were heated in ceramic furnaces placed on ground surface immediately to the south. After reaching the appropriate temperature, the furnaces' south sides were broken away to allow the molten ore to collect in a shallow tapping pit set in the ground immediately below it. Chemical analyses of samples taken from the burnt soils around the tapping pit revealed that they contain high levels of magnesium and limited iron when compared to prehistoric smelting loci in western Mexico (Kimberly King, personal communication, April 2006). Based on these results, it appears that copper processing at El Coyote may have differed significantly from metallurgical practices found at other places in prehistoric Mesoamerica. Once cooled, these materials were taken to the stone surface lying 4.5m to the south where pure copper, in the form of small droplets, or prills, was extracted by hammering the slag. In order to facilitate the retrieval of copper, water from the nearby Quebrada Seca may have been directed over the surface, washing away the lighter slag and leaving the heavier copper behind. It is possible that the channel identified in Str. 405 to the west was part of that effort to direct water to Str. 372-1<sup>st</sup>'s pavement. The latter is tilted slightly downward from west to east, likely indicating the direction of the water flow across the feature. The vertically set slabs that partially ring the surface could have been used to direct water across, and then away from, the water table as could the pieces of columnar basalt found north of the pavement.

The furnaces used in smelting copper at El Coyote were probably used only once. They, along with other debris, were jettisoned, sometimes in large deposits such as the one glossed as Structure 373-Sub2 (U.4). This trash heap covers evidence for copper processing that dates to earlier periods in the workshop's history. The preparation of a distinct area for dumping metallurgical debris is unusual in Op. 53 and 54. Mostly the detritus seems to have been scattered around the workshop, as seen, for example, at Str. 371 and in Subop. 53CF.

What most puzzles us about this challenging set of investigations are the constructions that occupy most of the terrace and from which few artifacts were recovered. Some, such as Strs. 368 and 414, are located in Op. 53 but most are found scattered across Op. 54. These buildings take several forms: extensive rock surfaces on which were raised stone foundations that likely supported perishable upper walls (Strs. 365, 368, and parts of Str. 414); stone-faced platforms (Strs. 369, 379, 411, and 414); and, boulders that are associated with low stone constructions or pavements (Strs. 360, 361, Subop. 53CI, CO, 54CB, CM, and CS). We struggled to make sense of these entities, trying to imagine how they, especially the boulder features, might have been produced by natural processes. In the end, we are inclined to see them all as the products of human actions though what motivated those actions remains a mystery. It may be that what we see in eastern Op. 53 and throughout Op. 54 was a late expansion of occupation on the low terrace, the relatively few artifacts found with these constructions suggesting that they were occupied for only a brief period of time. There are some hints of multiple periods of renovation on Strs. 414, 379-Sub1, and 54CB-Sub1 that tentatively imply that the use of these buildings was long enough to accommodate several remodellings. Still, it is hard to escape the

impression that occupation was longer in southwestern Op. 53 than it was in other parts of the low terrace.

The rock surfaces, seen in places like Str. 365, look to have been created as formalized activity areas analogous in their general forms to those recorded in western Op. 53 as well as in Op. 52. The latter area, on the high terrace directly east of El Coyote's Late Classic Main Group, seems to have been a locus for creating implements made from obsidian flakes. Structures 379 and 411 are a different matter, though the extensive rock surfaces associated with Str. 379-Sub1 might also have marked out distinct activity zones. The slight evidence for copper processing found in the environs of Strs. 379 and 414 suggests that some of these facilities were built to expand the copper workshop. If so, that project had not proceeded very far before prehistoric occupation on the low terrace ceased. That the workshop was precipitously abandoned is further suggested by evidence from Str. 372-1<sup>st</sup> where one furnace was found in place along with small fragments of copper slag that were still being worked atop that building's stone pavement. What had seemingly been a significant industry that was pursued for an extended period was suddenly abandoned.

Nonetheless, it is unlikely that all of the artifact-poor constructions recorded on the low terrace were built to increase the scale of copper processing here. The boulders, for example, likely played no roles in such a plan nor is it clear that Str. 411-1<sup>st</sup> was part of such an effort. The functions of these entities remain unknown.

Dating of occupation on the low terrace has been addressed elsewhere (see the references following this report). Based solely on the recovered artifacts, it would appear that use of this topographic feature was short-lived if episodic. There are only scant hints of settlement pre-dating the Terminal Classic (CE 800-1000) in the form of several sherds diagnostic of the Late Classic (CE 600-800) that were recovered from mixed contexts. These could easily have washed onto the terrace from the Southeast Group where there are clear signs of occupation dating to the Late Classic. By far the vast majority of the artifacts, especially ceramics, that were recovered from excavations in Op. 53 and 54 pertain to the Terminal Classic, including a few sherds of Plumbate and Las Vegas Polychrome pottery vessels. Material post-dating this interval is limited to objects that date to the late Historic era. The latter are found primarily in southwestern Op. 53 where there are a few constructions that were likely also raised at this time (Str. 376-1<sup>st</sup>, Str. 378-1<sup>st</sup>, and the wall [U.1] uncovered in Subop. 53CB). Terminal Classic materials were recovered in greater numbers here and are the only remains found throughout the rest of the investigated terrace. It appears, therefore, that the area encompassed by Op. 53 and 54 was heavily used during the Terminal Classic and that this was also the period when copper was being processed here. Subsequently, the lower terrace was largely abandoned until probably the late 19<sup>th</sup> century when a limited occupation of southwestern Op. 53 was initiated. By the time of our investigations in the early 21<sup>st</sup> century no one from the area and with whom we worked recalled people living in this portion of El Coyote.

### **Published Reports Related to Copper Working at El Coyote**

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2013 The Production of Copper at El Coyote, Honduras: Processing, Dating and Political Economy. In, *Archaeometallurgy in Mesoamerica: New Perspectives and Approaches*. S. Simmons and A. Shugar eds., pp. 77-112. Boulder: University of Colorado Press.