Copeland Revisited

2007-2009 Archaeological Excavations at a Mississippian Center

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Abstract

This report is an account of three seasons of archaeological excavations at the Copeland site, 9Ge18, in Greene County, Georgia. The site is located on a high bluff east near the northern end of Lake Oconee on land owned by the United States Forest Service. It has been known since about 1971, and has had several previous limited archaeological investigations. The work reported here took place between 2007 and 2009 as parts of University of Georgia archaeological field schools. The site seems to be the location of many ceremonial feasts about A.D. 1300. It likely was used for about 100 years, but not much more. It seems reasonable that festivals similar to historic busk festivals took place here. A series of nine structures were located in the excavations and likely represent both small council chambers and a probable square ground. Oddly the orientation of most of these structures is to the rising sun during the winter solstice. Although the site does not seem to be a permanent village, a secondary area of post molds was discovered 100 meters to the northwest of the main excavation area at the end of the project. This should be examined in the future to continue our progress in better understanding this important prehistoric center.

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Introduction and Acknowledgements

The Copeland site (9Ge18) is located in Greene County, Georgia, on part of the Oconee National Forest in the lower part of the Georgia Piedmont (Figure 1). Specifically, the site is located on the eastern side of Lake Oconee near its upper end on a high isolated bluff, overlooking the lake (Plate 1). This is just north of the confluence of Town Creek with the Oconee River (now Lake Oconee). It is located about 1.2 kilometers (.7 mile) southeast of the famous Dyar Mound, now destroyed under Lake Oconee, and about 16 Kilometers (10 miles) south of the equally famous Scull Shoals mound site, also on the Oconee National Forest (Figure 2). The site is located on a relatively isolated high flat hill. A noteworthy feature of the hilltop is the presence, on its western side, of a huge gully (Plate 2).

I thank James Wettstaed, forest archaeologist of the Chattahoochee-Oconee National Forests and John Mayer, who formerly held the same position, for their help in obtaining the ARPA permits required to conduct this work on Federal land and for their support and aid in many ways. James also edited a draft of this report, raising several important issues for me to consider.

All three seasons of excavations reported here for the Copeland site were conducted as part of University of Georgia Archaeology Field Schools under the direct supervision of the author. Without their hard work the project could not have been conducted.

The students from the 2007 Field School included Brandon Batt, Andrew Carbo, Hannah Clark, Ryan Cochran, Eve Copeland, Sean Cummings, Lara Duncan, Tabitha Ferguson, Kevin Gibbons, Michael Hunt, Evan Jaecks-Bonet, Michael Kennerty, Will Kinard, Alicia Lipsey, Richard Moss, Amanda Newsome, Hollie Pennington, Casey Sloan, Leslie Smith-Pryor, and Matt Wynn (Plate 3). My field assistant for 2007 was John Chamblee of the University of Georgia Department Of Anthropology.

The students from the 2008 Field School included Charlie Baldwin, Lindsey Byrne, Ian Carlson, Shannon Curry, Drew Edwards, Allison Hemphill, Jessie Hughes, Amanda Kersey, Kristin Morrison, Erin Peterson, Kristin Porter, Alisabeth Pritchett, Ryan Robinson, and Charles Saul (Plate 5).

For the 2009 season, the students included Sierra Castedo-Rodgers, Spence Downs, Pam Enlow, Tim Hall, Vanessa Hanvey, Lindsey Hinson, Allison Kohley, Robyn Latham, Warren Mullis, Brandon Schuler, Benjamin Shirley, and Richard Woerner (Plate 8). My field assistants for the 2009 season included UGA doctoral students Ben Steere and Dan Bigman.

Jared Wood of the UGA Laboratory of Archaeology has helped in many ways in all three seasons and I thank him for his efforts. He also edited the first draft of this report. I thank Dan Elliott of the Lamar Institute for his brief ground penetrating radar survey project during the summer of 2008. I also thank Woody Williams of Madison, Georgia, for his help in 2008 in interpreting the structure patterns present in Excavation Unit 2. Woody, my father, also helped me with the 1991 excavations at the site. He got me interested in archaeology in 1967 and has been my oldest archaeology friend and sounding board.

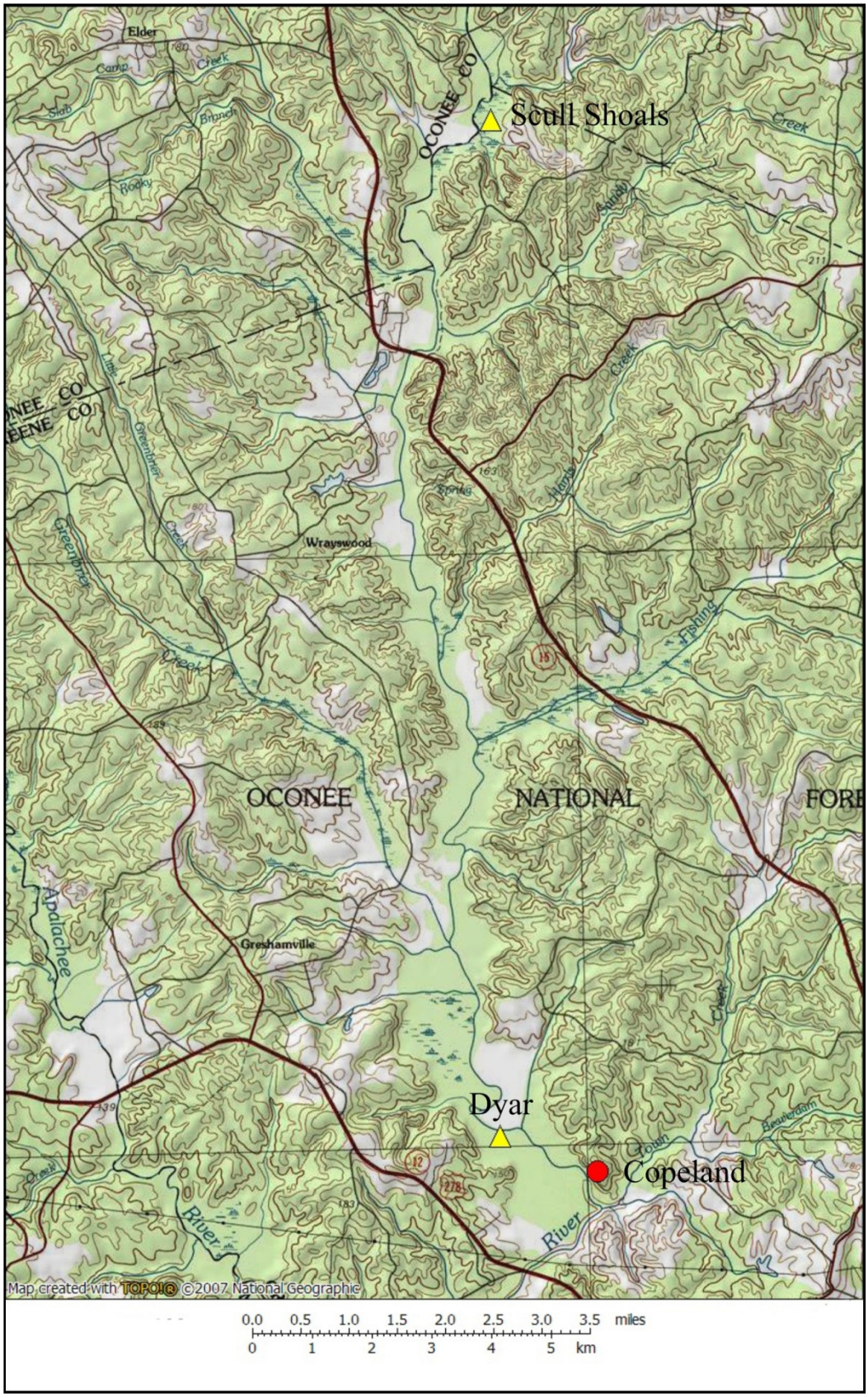

Figure 2. Copeland, Dyar, and Scull Shoals.

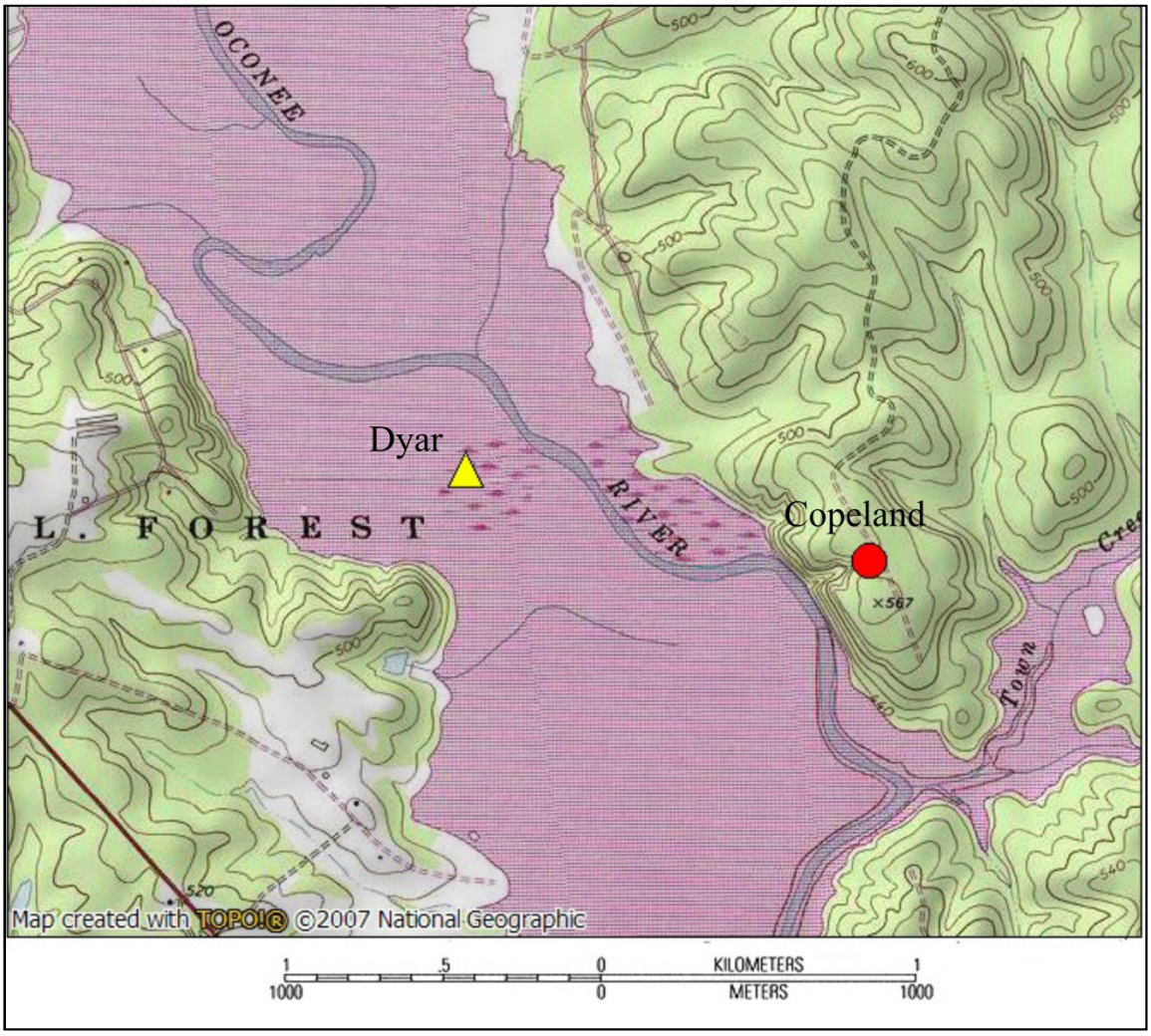

Figure 3. Copeland, Dyar, and Lake Oconee.

Plate 1. Copeland Site Looking East from Lake Oconee.

Plate 2. Huge Gully in Western Part of Copeland Site.

New Site Grid and Contour Map

I am presenting this section ahead of its logical placement in the report since I have been able to map several of the older projects at Copeland into the new grid. This has been difficult, to say the least, but I am reasonably confident in the results.

In 2007 a new site grid was installed in the Copeland site. A single piece of steel rebar 75 centimeters long was placed into the ground some 2 meters south of a large red oak near the center of the site. This tree was some 35 meters northeast of the most easterly edge of the huge gully dominating the west-center part of the site. This tree played an important part in our attempts to integrate the earlier projects into the current research, and produce a complete map of all the earlier projects. This will be made more explicit shortly.

The steel pin south of the tree (which has had many impromptu deer stands made of 2 by 4s and nails placed in it) was designated as location 500 North, 500 East in meters, and the surface of the ground at that point was given an arbitrary elevation of 100.00 meters. The actual elevation of that point is roughly 171 meters (560 feet) above mean sea level as read from a USGS map. As implemented, the 0 North, 0 East point would be somewhere in Lake Oconee to the southwest of the site. The grid was oriented to magnetic north as defined in June of 2007 using a compass on an old Leitz optical transit (1960s vintage) owned by the UGA Laboratory of Archaeology.

Wooden stakes were placed at 20 meter intervals away from this point using tapes for measurement. All survey and mapping work after the initial placement of the North-South baseline with the transit was conducted using a Total Station. Actually, during the 2007 season, two Total Stations were employed on the project. The first was a Sokkia Set 6F, while the second was a newer Sokkia Set 630R. The latter was solely employed during both the 2008 and 2009 seasons. During the 2007 season, the Set6F was used in conjunction with a Psion data collector. The 630R did not require a separate data collector. All data was downloaded onto a laptop computer, and ultimately converted into Excel tables for mapping and report presentation. A series of some 15 Instrument Points were scattered throughout the site for creating the contour map of the site. Approximately 1500 points were recorded to create the contour map. The locations of all the post molds, features, and most of the shovel tests were also recorded using the Total Station.

The huge gully on the western edge of the site, one of the largest in the entire Georgia Piedmont, presented special mapping problems. The top edge of it was mapped directly from a series of standard instrument shots from several different instrument points. The interior was not mapped directly, but a series of “fake” points were placed at appropriate north and east coordinates with estimated elevations to permit the creation of the map. This same sort of process was used to “map” the steep western bluff area south of the gully. While the results do not represent an exactly accurate map, I (and the students who did not have to go into the gully!) am happy with the results. All of the locations of the elevation points are shown in Figure 3 with respect to the contour map of the site. The actual contour map was made using the program Surfer (version 9) from Golden Software. It is presented here as Figure 4. Note that there are essentially two small hills on the summit of the generally flat-topped site, the higher being to the south and the lower to the north. The center of the site is in a saddle adjacent to the huge gully.

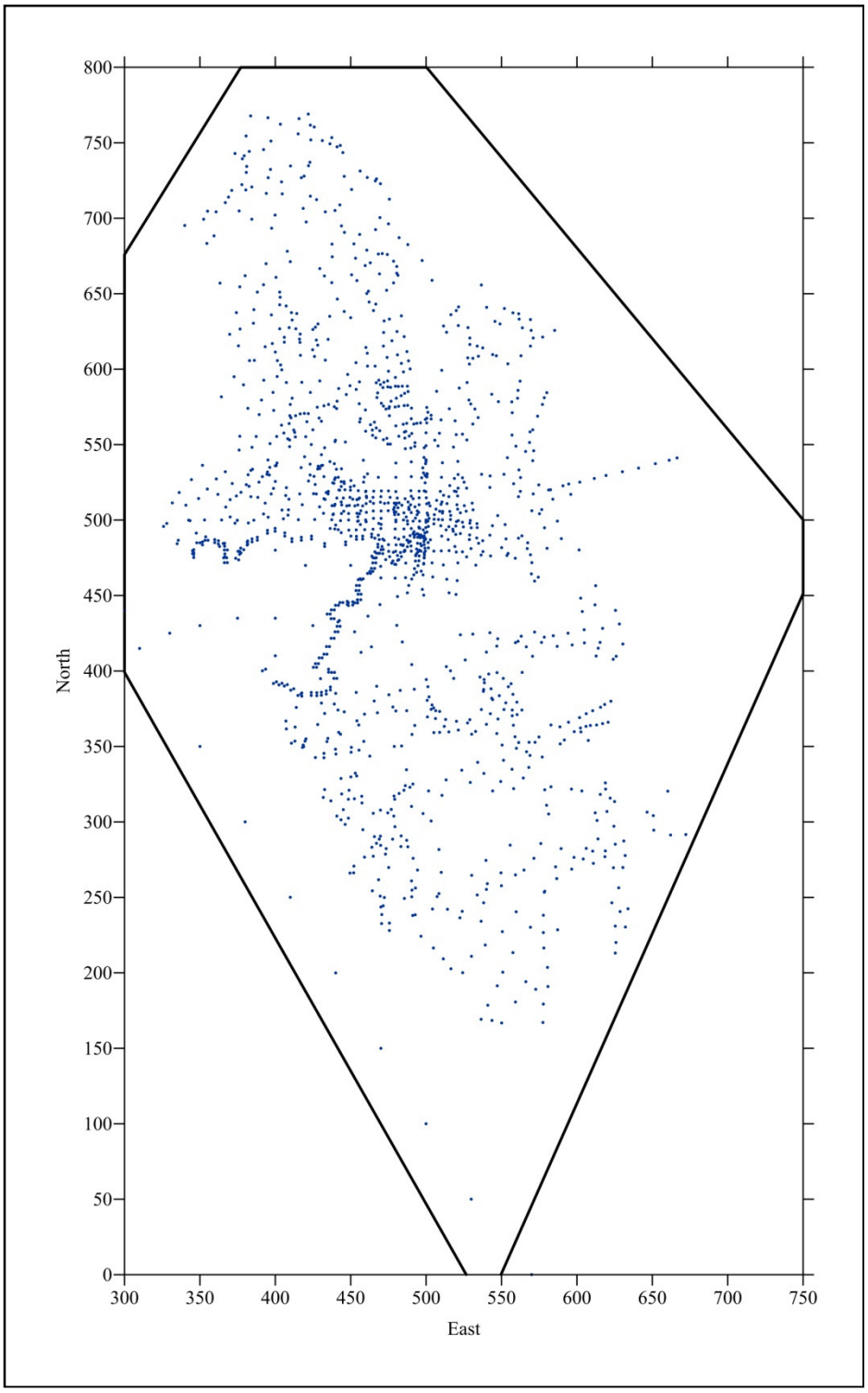

Figure 4. Location of Elevation Points (Grid in Meters).

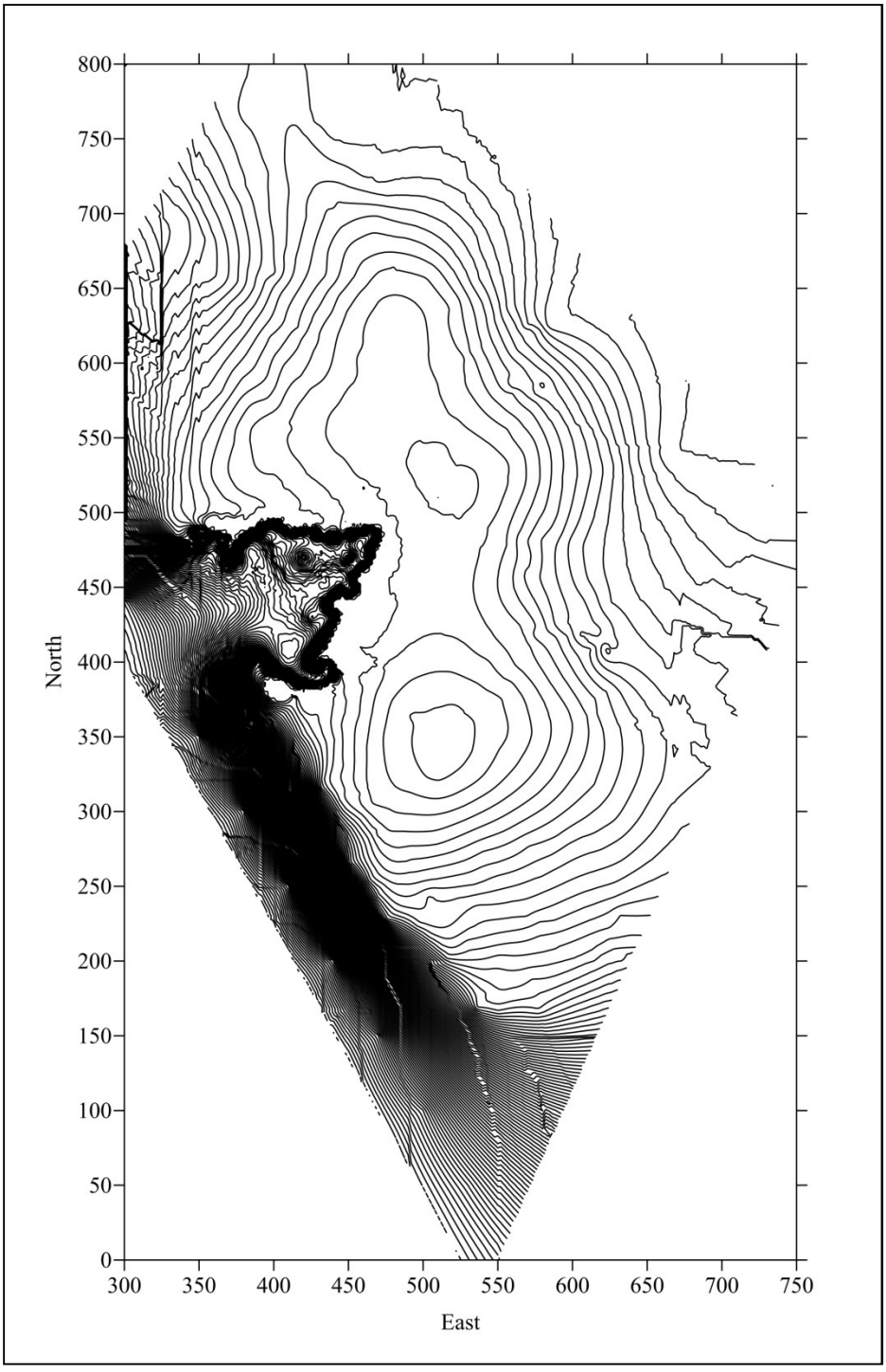

Figure 5. Contour Map, 50 Centimeter Contours (Grid in Meters).

Archie Smith 1971 Project

Copeland was first recorded as an archaeological site about 1971 as part of the first archaeological survey conducted in advance of the construction by Georgia Power of Lake Oconee by Archie ("Butch") Smith, working for the University of Georgia. This project was under the direction of the late Joseph Caldwell of the University. Smith was hired with funds from a small grant from Georgia Power and worked off and on for much of that year. His survey was almost exclusively one of meeting local informants (such as H. Armour and Jessie Copelan) who took him to sites that they knew of in the area. Most of the sites he located were thus fairly large ones. His was hampered by poor maps (no good USGS maps were yet available for the area), and his site location information is of limited value in many cases.

Smith apparently was first taken to the Copeland site by Jessie Copelan, who had owned the site from 1948 until 1972 and had recently sold it before showing it to Smith. Copelan was an employee of the U.S. Forest Service. Presumably Smith made surface collections but no excavations were made at the site by him. Smith gave the site its current site number of 9Ge18. He supposedly saw post molds eroding from the profile of the huge gully near the western edge of the center of site. The site's location on a 40 meter (130 foot) high bluff overlooking the planned lake (completed in 1980) meant that there was never any possibility of it being flooded, and thus further work there was considered of low importance at that time. The site was privately owned until 1980 when it was acquired by the U. S. Forest Service and became a part of the Oconee National Forest. If Smith wrote a report on his survey it has apparently been lost. DePratter refers to it in his 1976 report discussed below. It is possible that Smith's "Report" consisted just of rough field notes.

Chester DePratter 1974 Project

In 1974 and 1975 a new larger survey and testing project of the intended Lake Oconee area was conducted, again by the University of Georgia. The field work for this was led by then UGA doctoral student Chester DePratter. His field crew consisted at various times of Dean Wood, John Doolin, Greg Paulk, Robin Johnson, and a few others. This project had the benefit of much better maps that had been made available by the engineers tasked with planning the reservoir project. DePratter implemented shovel testing as a method for locating archaeological sites in forested areas, one of the first instances of this now standard technique in Georgia. He also conducted testing at a large number of sites, especially the Dyar and Cold Springs mound sites.

The DePratter crew visited the Copeland site in 1974 and made a surface collection of some 97 artifacts from a small plowed strip that was then present at the site. No excavations were conducted by his team at Copeland. He completed a large volume detailing the results of this project in 1976. His survey included a revisit to the Copeland site. The following paragraph is extracted verbatim from the report by DePratter (DePratter 1976:144-145). It is included here since his report is not readily available for reference. It documents his brief visit to the site and lists the artifacts located in a surface collection made there. He suggests that most of the sherds are of the Lamar period, but the only ones that really can be identified with confidence were 3 pinched rim sherds and 1 punctated rim sherd. Note that despite DePratter's assignment of the site as 9Ge139, all later researchers have reverted to labeling it as 9Ge18 as Smith did.

9Ge139 UTM N3719672 E290048

Ge139 is probably the same site which Smith (1971) recorded as Ge18, but since this identification is not certain, a new number has been assigned. The site is located on the edge of an upland bluff formed by the erosion of an immense gully which cuts back into the pasture in which the site is located (Figure 55). To the east of the site are the uplands, while to the west, at the base of the slope, is the Oconee River. Across the river is the large bottom on which the Dyar mound (Ge5) is located, and upriver on the east side is the Cold Springs Site (Ge10). Town Creek is located approximately 700m down river from Ge139. Much of the cleared area around the site is in pasture, but at the time of our visit, a 50m by 9m strip had been recently plowed. A complete surface collection was made from the surface of this exposed area. The collection contained the following material:

Aboriginal Artifacts

Ceramic

Lamar Plain	64
Lamar residual decorated	23
Lamar (?) Check Stamped	1
Lamar pinched rims	3
Lamar punctated rim	1

Lithic

Quartz waste flakes	3
Rocks	2

The site contains evidence of a single occupation during the Lamar Phase. Field notes do not indicate site dimensions, nor how the outline shown in Figure 55 was determined. Smith (1971) noted two postholes in the profile of a large gully on the site. The 1974-75 survey could find no evidence of such features, though they could easily have been destroyed during the three years between the two surveys. No other features were observed.

The site will not be flooded, but may be disturbed as a result of shoreline development subsequent to filling of the reservoir. It is recommended that the site be plowed and surface collected. In addition, two 2 meter square test pits should be excavated to determine the presence or absence of midden and features.

DePratter recognized (personal communication), as had Archie Smith, that the site would not be flooded, but it was obviously a large "village" that certainly was likely an important site for future examination and interpretation of the prehistory of this part of the Oconee River valley. As his report shows, he believed that it was likely a Late Mississippian Lamar occupation, although I now believe that most of it dates a bit earlier in time. His recommendations of a controlled plowing and excavation of a few excavation squares as part of the final Lake Oconee archaeology project were not implemented.

Southeastern Archeological Services 1987 Project

As stated above, the site came under the ownership of the U.S National Forest Service in 1980. The site was by then becoming well known to the local archaeological community as a potentially important one. During the summer of 1987 Southeastern Archeological Services (SAS) was hired by the Forest Service to check out the site as part of a larger survey project they were conducting on the Oconee National Forest at that time. The idea of nominating it to the National Register of Historic Places was apparently the idea of Jack Wynn, then Forest Archaeologist with the Forest Service. In order to aid the application some simple archaeological testing was apparently desired. This simple project was led by Kay Wood, Dean Wood, and Charlotte Smith, all then associated with Southeastern Archeological Services, of Athens, Georgia (Wood and Smith 1987). Chad Braley, still with that firm, also participated in the project.

This project represented the first known subsurface examination of the site. The locations of their shovel tests are shown here by number with reference to the current contour map in Figure 5. The locations are the best that can be determined now 22 years after the fact. SAS obviously did not put in a site grid, but merely selected these locations at roughly 50 meter intervals along their line through the site. The number of sherds in each of the shovel tests is listed here as presented by SAS in their report. The types were, not surprisingly, not described in their report since the sherds were so small. In lieu of an actual contour map of the sherd density from this data, Table 1 shows the locations of the tests including the number of sherds per test. The data clearly show (Shovel Tests 1-6) that the area of the site with the highest sherd density was the center of the site, just east of the huge gully.

The site was nominated and eventually successfully included on the National Register that same year. Unfortunately, the site name on the paperwork was listed as *Copeland*, rather than *Copelan*, the former owner of the site. For consistency with the National Register listing, I have retained the name Copeland for the site work reported here, with apologies to Jessie Copelan, wherever he may be.

ST	North	East	Sherds
1	497	490	18
2	483	546	5
3	545	500	16
4	432	558	13
5	377	566	10
6	322	574	11
7	590	483	3
8	272	583	4
9	636	471	0
10	215	590	1
11	680	455	1
12	727	435	4
13	160	598	1
14	115	608	0
15	768	415	1
16	65	618	0
17	768	355	0

Table 1. SAS 1987 Shovel Test Data.

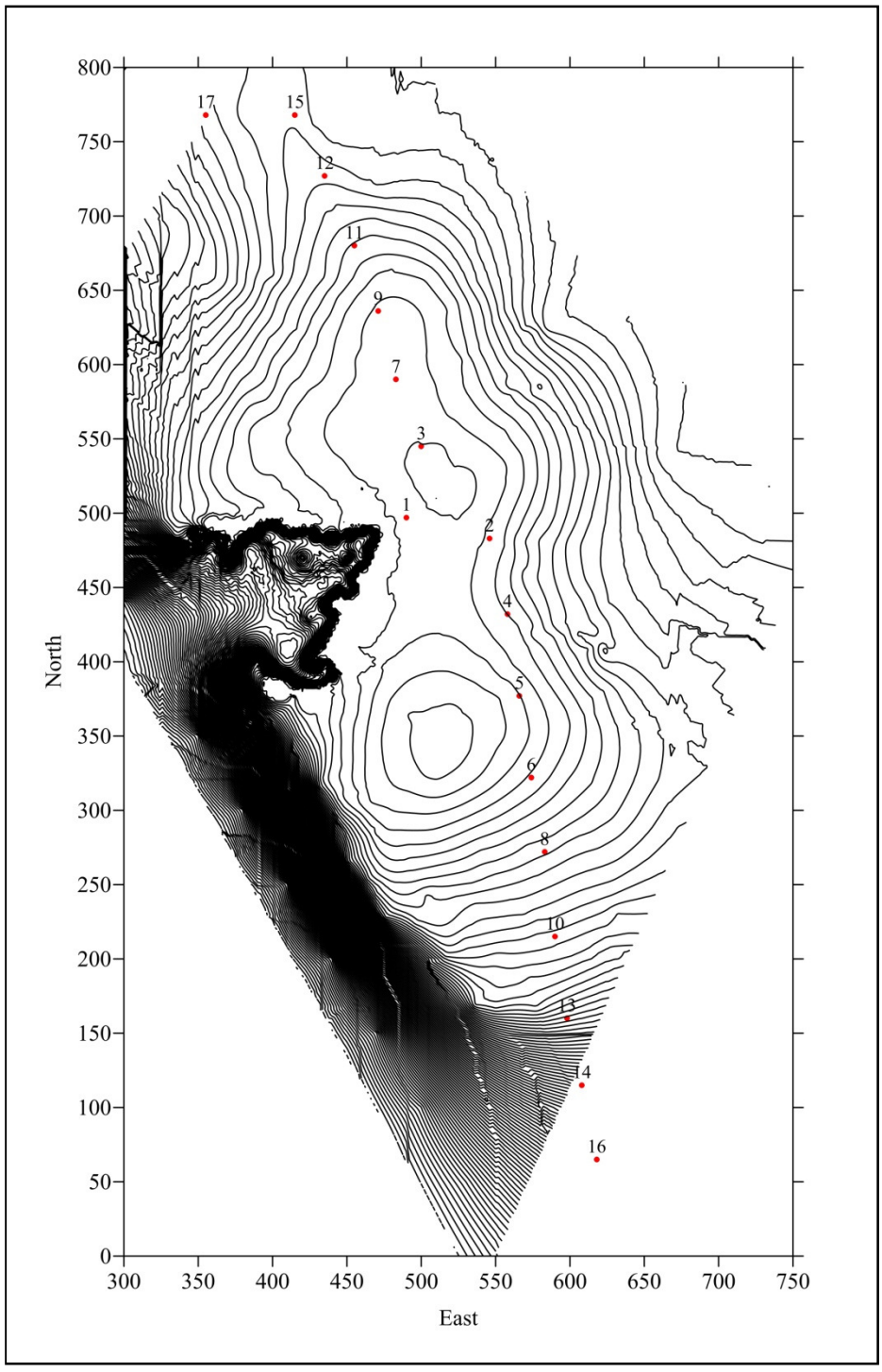

Figure 6. SAS 1987 Shovel Test Locations (Grid in Meters).

Jack Wynn 1987-1988 Project

In the late fall of 1987 and winter of 1988 Jack Wynn, then Forest Archaeologist for the Chattahoochee-Oconee National Forest, led a number of volunteers from the Georgia Mountains Archaeological Society on a testing project at the Copeland site. This work was conducted over several months on weekends with crews averaging about 6 people. His project was designed to determine better the components present at the site and their distributions. Ultimately, this was part of the background research that was deemed necessary for the application to have the site placed on the National Register of Historic Places. This application, led by Wynn himself, was finally approved and the site is now listed on the Register. To this end he oversaw the excavation of 42 excavation units each 50 by 50 centimeters in size. No final report was ever made of this volunteer project, but a rough draft and the raw data were made available to the current author by Wynn (Wynn 1988).

The 42 units were placed along measured distances east and west from a baseline placed in the site for him by Forest Service surveyors. This baseline was angled west of north-south, just as had been the line of shovel tests by Southeastern Archeological Services. The northern and southern end points of this line had been marked with aluminum capped steel bars placed into the site at the extreme ends as permanent markers. Unfortunately the "permanent" markers were long gone by the summer of 1991 when I led the first UGA project at the site. Presumably hunters or vandals had removed them between 1987 and 1991. Even a careful search by Jack Wynn himself in 1991 failed to turn up the lost markers.

All of the units excavated by Wynn were screened with ¼ inch hardware cloth to recover artifacts. As it turned out, however, the vast majority of the artifacts were very small sherds that were very difficult to identify with much confidence. The most important part of his work was that he was able to provide data to permit the creation of a better artifact density map for the site. The approximate locations of his units with their numbers are presented in Figure 6, while the density of sherds from all the units is presented in Figure 7. Incidentally, both of these maps were created with reference to the current grid of the site as implemented in 2007. Since Wynn's aluminum markers were gone this was a difficult task. Wynn had informed me that his Unit 15, as best he remembered, was just south of the large red oak tree used as a deer stand--the same one I have placed new location 500 North, 500 East near (see below). There was no evidence of his backfilled 50 centimeter square there in 2007. We know the angle of his base line off of north, and thus I have been able to estimate the locations of all his small excavation units with reasonable accuracy. Incidentally, as I write this in 2009, the oak tree, one of the largest on the top flat area of the site, appears to be dying. The total list of Wynn's unit locations and artifacts is presented on the next page in Table 2.

One problem experienced by both SAS and Wynn was that the sherds recovered by them were very small, and thus component definition and distribution was very difficult. The site had been plowed many times in the 19th and 20th centuries. Neither of the projects found intact midden on the plow-zone site.

Pit	North	East	Total Sherds	Total Lithics
1	353	561	1	0
2	343	523	5	0
3	332	484	0	1
4	320	446	0	0
5	306	533	0	5
6	294	495	3	5
7	328	611	4	0
8	316	572	2	0
9	279	584	0	0
10	268	546	1	1
11	257	506	0	0
12	428	541	8	0
13	468	528	45	10
14	505	519	18	3
15	500	500	95	15
16	494	482	116	17
17	496	488	22	0
18	456	491	17	0
19	446	453	27	5
20	478	569	13	7
21	488	607	8	4
22	530	469	16	4
23	554	547	13	1
24	580	497	33	1
25	619	487	9	3
26	522	431	18	2
27	514	396	19	1
28	390	551	0	0
29	501	354	9	0
30	543	508	77	2
31	419	501	60	3
32	407	463	30	0
33	398	433	4	2
34	494	626	8	4
35	495	635	19	2
36	380	512	11	5
37	368	471	2	0
38	360	438	2	0
39	401	587	1	1
40	483	668	10	2
41	493	708	1	0
42	475	632	13	0

Table 2. Wynn's 1987-1988 Excavation Unit Data.

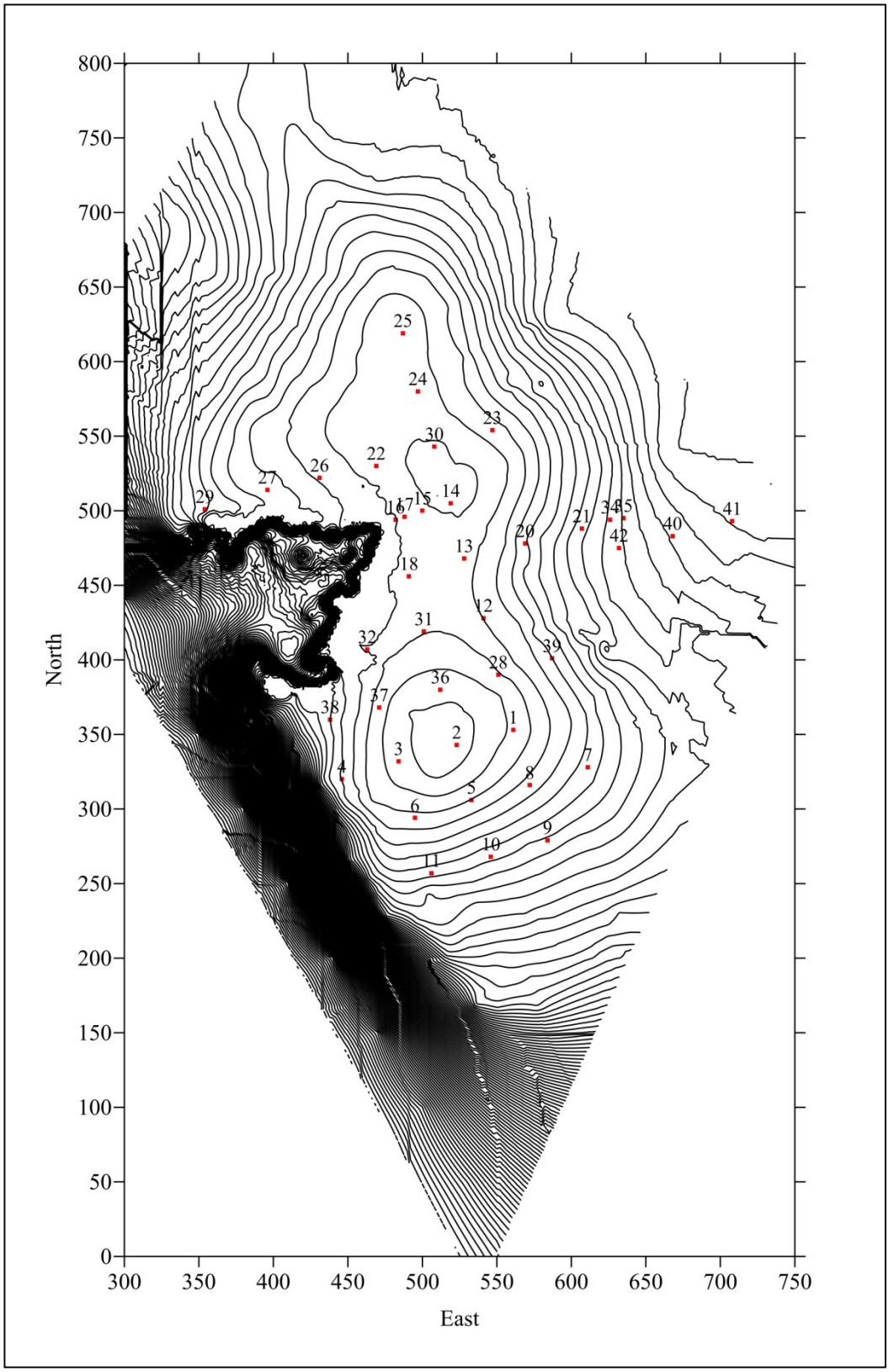

Figure 7. Wynn's 1987 Excavation Unit Locations (Grid in Meters).

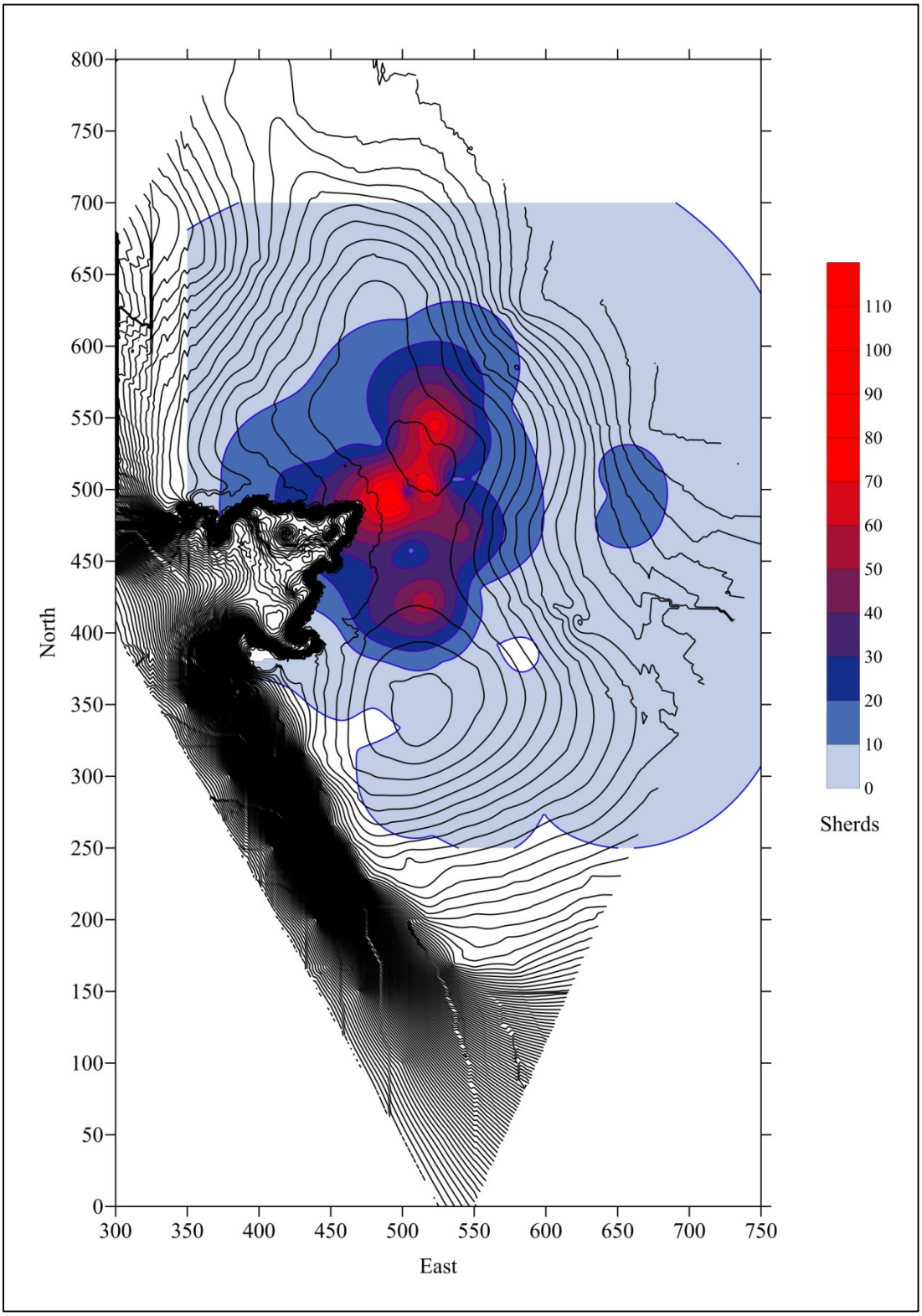

Figure 8. Wynn's 1987 Sherd Density Map (Grid in Meters).

Mark Williams 1991 Project

In the summer of 1991 as a small part of a University of Georgia Archaeology Field School I led students to the Copeland site for a single week during July (Williams 1991). Jack Wynn was instrumental in obtaining an ARPA permit for our work there. We camped on the site for two days, but torrential rains ended that experiment quickly! The purpose for the work was to attempt to overcome the component identification problem that all earlier researchers to the site had encountered. The problem had been (and still is) that the site was so heavily plowed in the 19th and 20th centuries that most of the sherds there are small and eroded. The soil at the site is thin humus over sterile red clay subsoil. I attempted to overcome this limitation by excavating larger squares (full 2 by 2 meter units), thus belatedly implementing DePratter's 1976 recommendation. My own research in the Oconee River valley prior to that had been heavily oriented toward the Late Mississippian Lamar period, and most of the earlier researchers had strongly suggested that this was the most likely time period for the Copeland occupation. A complete report of the 1991 project was prepared by the author (Williams 1991).

In that single week of work we excavated 16 units, scattered widely over the site. These were placed simply based on my intuitive sense of even distribution and were oriented individually to magnetic north using a compass. These were mapped at the time through the use of an old traditional transit to measure angles and distances. Since I did not have the benefit of Wynn's grid, I implemented a new grid on paper to present the locations in my 1991 report. For the current report, I have recalculated the locations of all 16 units in terms of the new 2007 grid. Unfortunately, none of the units from 1991 were still visible in 2007. I feel confident, however, that all the units are accurately mapped within less than a meter from their original locations. The locations of all of these units are presented on the current grid as shown in Figure 8. Since they were located and excavated without reference to an in-place grid, they do not fall at even meter locations. The following table (Table 3) presents the exact data. The mean location for the center of each square was derived from the four corner coordinates and this was used for purposes of the map presented in Figure 8.

The distribution of pottery based upon the 1991 data is presented here in Figure 9. This is very similar to that created above for the work of Jack Wynn presented earlier. We conducted no shovel tests in 1991. The distribution of the 1991 animal bone fragment data is similarly presented here in Figure 10. After the 1991 project I really did not think I would ever come back to the site for further research.

Square	North 1	North 2	East 1	East 2	Mean North	Mean East
1	497.0	499.0	476.0	478.0	498.0	477.0
2	554.0	556.0	501.0	503.0	555.0	502.0
3	596.0	598.0	498.0	500.0	597.0	499.0
4	631.0	633.0	479.0	481.0	632.0	480.0
5	680.0	682.0	455.0	457.0	681.0	456.0
6	566.0	568.0	539.0	541.0	567.0	540.0
7	494.0	496.0	544.5	546.5	495.0	545.5
8	453.0	455.0	523.0	525.0	454.0	524.0
9	506.0	508.0	520.0	522.0	507.0	521.0
10	493.0	495.0	581.0	583.0	494.0	582.0
11	509.0	511.0	435.0	437.0	510.0	436.0
12	537.0	539.0	372.0	374.0	538.0	373.0
13	392.0	394.0	529.0	531.0	393.0	530.0
14	349.0	351.0	537.0	539.0	350.0	538.0
15	342.0	344.0	473.0	475.0	343.0	474.0
16	464.0	466.0	487.0	489.0	465.0	488.0

Table 3. Williams' 1991 Excavation Square Locations.

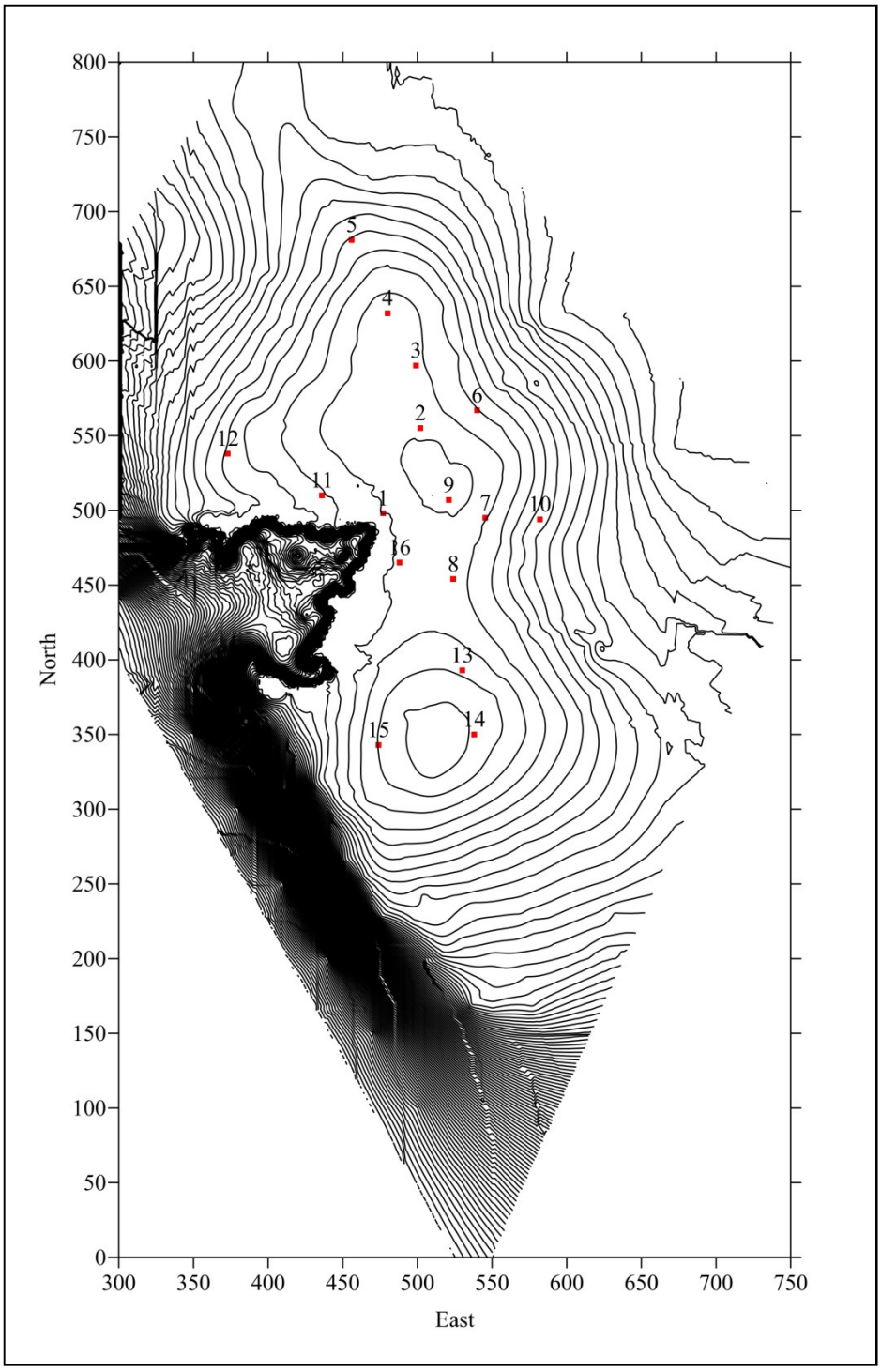

Figure 9. Williams' 1991 2 Meter Square Locations (Grid in Meters).

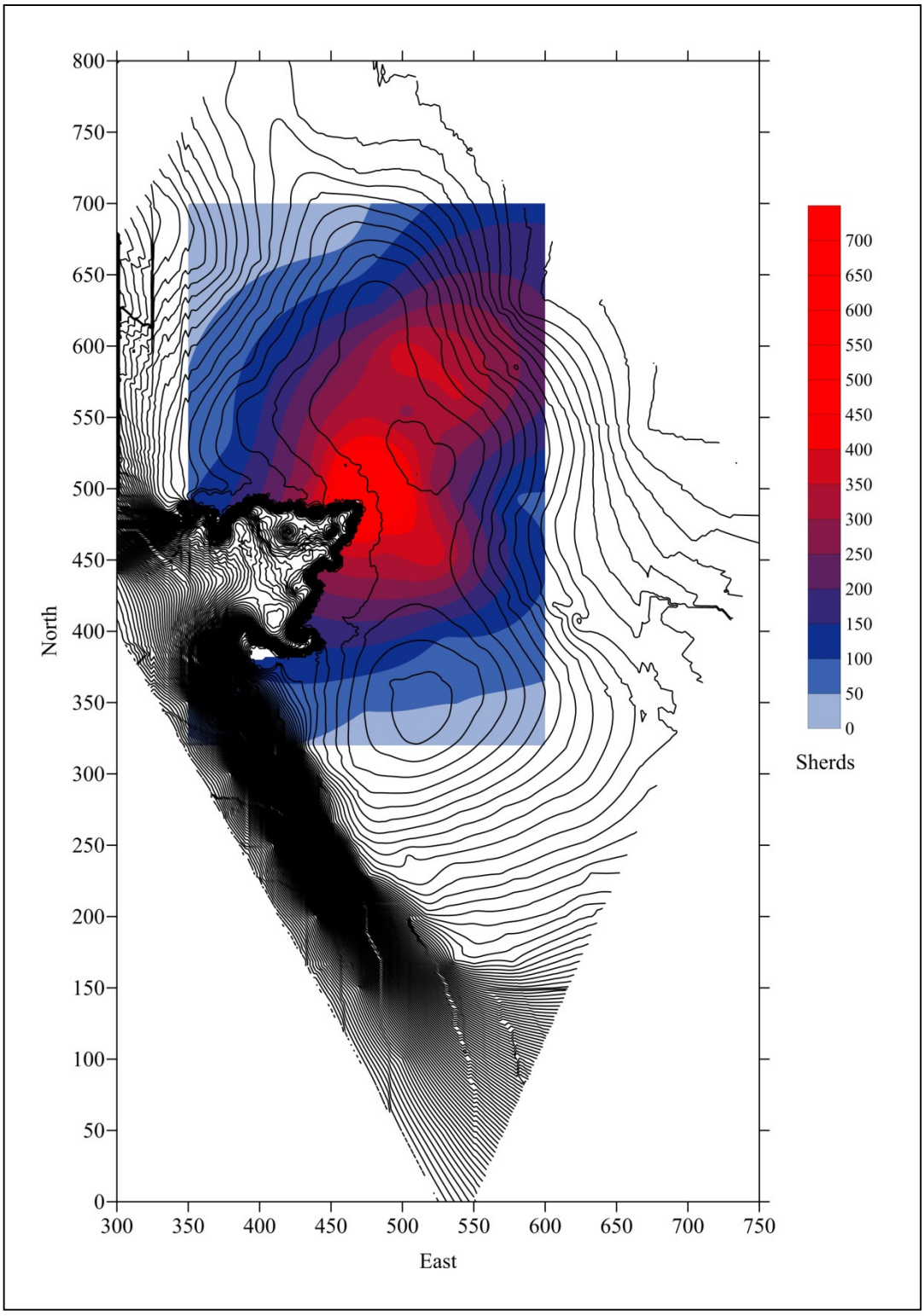

Figure 10. Williams' 1991 Sherd Density Map (Grid in Meters).

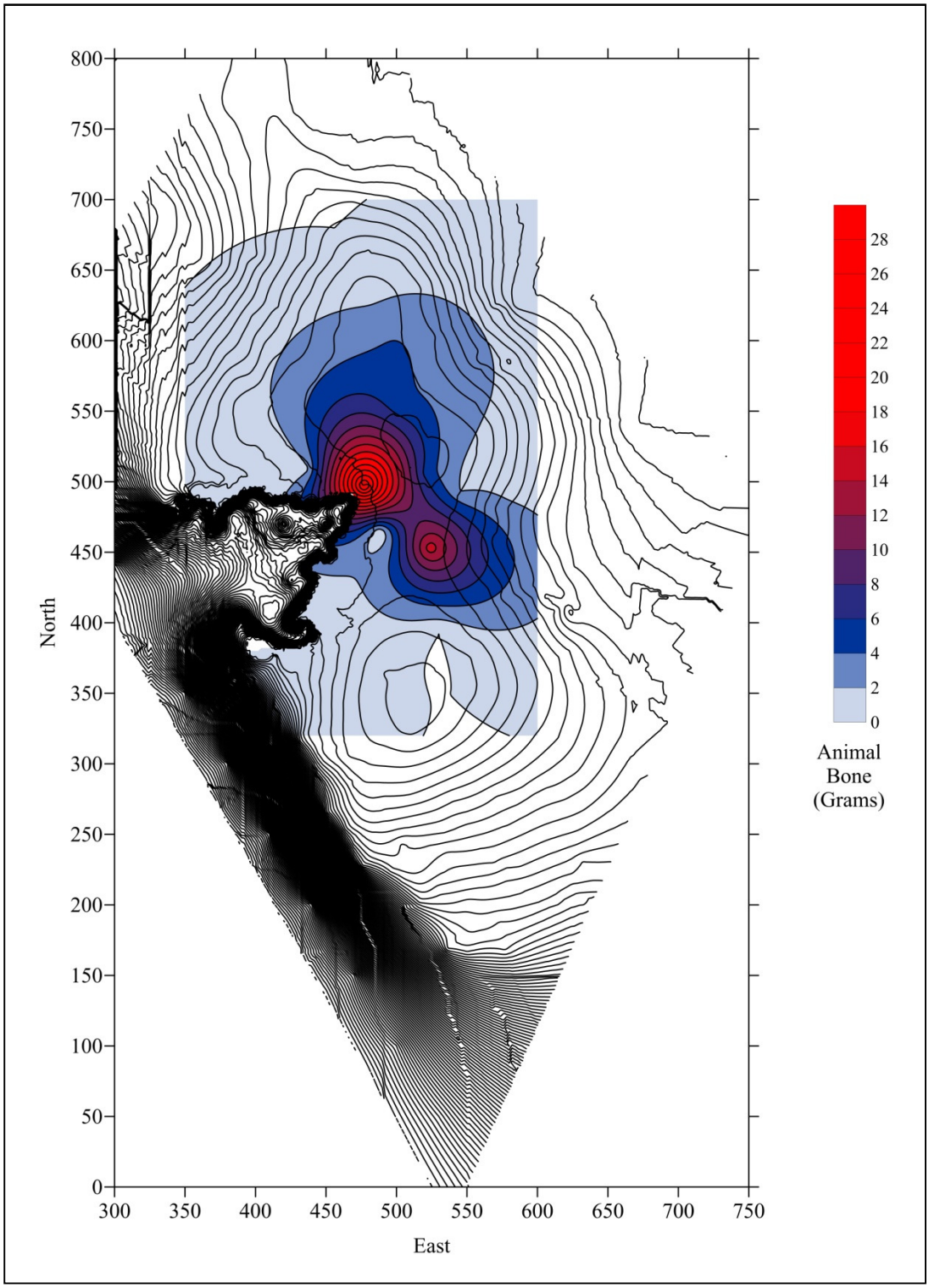

Figure 11. Williams' 1991 Animal Bone Density Map (Grid in Meters).

Current Project Theoretical Background

The Copeland site has been characterized since its discovery as a large Mississippian period village. There is a light scatter of pottery over an area about 600 meters (2000 feet) by 210 meters (700 feet) in size, oriented northwest to southeast. This makes the total area about 12 hectares (32 acres) in size. Over most of this area, however, the sherd distribution is very thin. There is a much heavier concentration of artifacts however, in the center which is a fraction of a hectare in size. The center of the Copeland site is located about 1.2 kilometers (4000 feet) east - southeast of the famous Dyar Mound site (9Ge5) (Smith 1994), a late Mississippian mound center now destroyed under Lake Oconee. Dyar had limited excavations in 1977-1978 prior to the creation of Lake Oconee. It has been known for some time that the Dyar site was a fairly small Mississippian mound site, and possibly was a chiefly compound (Williams 1995a). In this regard Chad Braley, who has also conducted surveys in the area, has called the Copeland site the "Dyar Village", since it is the only nearby large site of roughly the same time period (Personal Communication 1991). Much of this perspective, however, was developed before we realized that the vast majority of the people in the Oconee valley lived in tiny individual farmsteads. Dyar was heavily occupied in the Early Mississippian and the Late Mississippian period, but seems to have been abandoned during the Middle Mississippian period.

The previous work at the site had established that it was likely occupied during the early late part of the Duvall phase into the early part of the Iron Horse phase of the Lamar period in the Oconee River valley (Williams and Shapiro 1990). This placed it at about A.D. 1400-1450 in time by best estimates of 1991. There are virtually no other known sites of this period in the Oconee River valley that are as large as Copeland. In fact, for most of the Late Mississippian period in the valley, the majority of sites are small dispersed farmsteads of less than ¼ hectare (.66 acre). Such sites number in the thousands in the Oconee River valley. The unusual nature of the Copeland site as a large village has been accepted for some time, and it has been assumed to this point that its internal structure was that of a "normal" Mississippian village--a ring of houses, likely surround by a palisade, and likely with an open plaza area in the center. This would be similar to the famous King site (9Fl5) excavation in northwestern Georgia (Hally 2008). It has always seemed a bit incongruous, however, that such a large village would be a part of a social system where there are large numbers of small farmsteads widely distributed over a large area. This is certainly not the case near the King site, or other "classic" Mississippian villages throughout the South.

Between 1998 and 2006 the author conducted excavations on Late Mississippian sites in the western part of the Oconee River valley, specifically in the Little River valley some 32 kilometers (20 miles) to the southwest of the Copeland and Dyar sites (Williams 2003, 2004, 2005, 2006a, 2006b, Williams and Shapiro 1990). In summary the following observations can be made. First, all the sites there date to the Dyar phase, about 1500-A.D. 1550. Second, there is a single small mound center interpreted as a chiefly compound (Little River, 9Mg46). Third, there are hundreds of farmsteads, a number of which have been tested and excavated (e.g. Monroe and Lauren sites). Finally, a single large "village" site was present and excavated extensively. This was the Bullard Bottom site, 9Pm169.

Excavations at the Bullard Bottom site revealed a large circular "Council House" at the center of the site (Williams 2005). Nearby was a series of small rectangular buildings that I have interpreted as a "Square Ground" similar to those used by the historic Creek Indians (Swanton 1928). The large additional part of the Bullard Bottom site is now interpreted not as a village that was continuously occupied, but as a locus where the entire community that was normally dispersed over many square miles would concentrate themselves for a few days each year as part of the historically described Creek busk ceremony. This was historically associated with the first harvest of corn in late July and is also commonly called the "Green Corn" ceremony. Socially, this 1-2 week event was the most important part of the year for the community in many ways (Hudson 1976).

The hypothesis driving the current excavations at Copeland is that it may have served an analogous role in the main Oconee River valley near the Dyar site as did the Bullard Bottom site near the Little River mounds, but at a period about 100-150 year earlier in the valley's Mississippian chronology. To test this hypothesis, excavations at the Copeland site were conducted from 2007-2009 and the results are presented in the remainder of this report.

The Copeland site has a shallow top soil that was plowed for over 100 years. The average depth to sterile soil is only about 15-20 centimeters. The sherds in the plowed topsoil are broken into very small fragments. Indeed, this is the reason that I had to excavate larger 2 meter square units in 1991 to get sufficient numbers of phase-identifiable sherds to date the site. As part of this work we also have created a more extensive contour map of the site using modern survey equipment.

If it can be determined eventually that the Copeland site is an earlier analogue to the Bullard Bottom site, much will have been added to our understanding of the nature of Mississippian social systems in the context of dispersed settlements. Specifically I would hypothesize that in such systems, a small chiefly compound would routinely be paired with a council house-busk site at a distance of a kilometer or two away. The chief and his family would have lived at the mound site, and the removed council house would serve as a more egalitarian discussion or legislative center that would provide a balance to the power of the executive or chief at the nearby mound center.

Many mound sites in nucleated Mississippian systems are known to have council houses on the same site as the mound--Etowah, Ocmulgee, and Irene in Georgia come to mind. The Oconee River valley is actually one of the few truly dispersed Mississippian settlement systems in the South, and as such it makes sense that the geographic distribution and organizational structure of political centers and types might be a bit different from those of the common nucleated societies. The difference between nucleated and dispersed settlement systems is usually attributed to the intensity and frequency of warfare in Mississippian societies. If this is true, the Oconee Mississippian societies were more peaceful that the average Mississippian society in the South.

2007 Season Overview

I knew from the 1991 work that the only unit that produced any post molds was Unit 1, located in the area east of the huge gully (Williams 1991). I also knew that the sherds from here would be small. In order to open a large area in a short period of time, I opted to open trenches without screening the fill. We did, however, implement a strategy of excavating shovel tests at close intervals (5 meters in the center area, and 10 meters further out) in order to search for patterns in the distribution of sherds near the core. We also began a program of making the new contour map of the entire site.

Trench 1 was excavated east to west in what became the northern part of the main area of research. This is now labeled as Excavation Unit 1. It was 10 meters long (E-W) by 2 meters wide (N-S) and was located between 517-519 North and 470-480 East (Figure 11). There were a few post molds in the unit, and two small features in the western part of the trench. The post molds were more common in the western part also, but did not show any pattern to their distribution. As a whole the data from here were only mildly promising.

Trench 2 was then placed also in an east-west direction, but about 15 meters to the southwest of Trench 1. The coordinates for this trench were 498-500 North and 475-485 East. While the number of post molds in the eastern end of this trench did not seem exceptional, the number significantly increased in the western end of the trench.

Trench 3, another 2 meter wide trench, was then placed to the south from the western end of Trench 2. This was located from 488-498 North and 475-477 East. This trench showed a great many post molds in its northern end, and a decreasing number in the south. By this point it was becoming obvious that we were locating an area with a great number and density of post molds that quickly became an area of great interest.

To confirm that this area of higher post mold density was real, however, I decided to place a western extension or continuation of Trench 2 (Trench 4), and a northern extension of Trench 3 (Trench 5), thereby creating a cross trench effect. Both of these new trenches were also 10 meters by 2 meters in size. Trench 4 was from 498-500 North and 465-475 East. Trench 5 was from 500-510 North and 475-477 East. The number of post molds did drop in both directions as had been hoped. At the northern end of Trench 5, however, a couple of features were noted.

The final excavation of 2007 was called Trench 6, even though it was actually more block shaped. Given that it seemed clear at that point that the area of highest post mold density was to the southeast of the now crossed trenches, we placed a 5 by 3 meter sized block (Trench 6) in to that corner, north to south. This was from 493-498 North and 477-480 East. Trench 6 was absolutely loaded with post molds as had been hoped for. Trenches 2-6 from 2007 are now labeled as part of Excavation Unit 2, the largest on the site.

The rest of the 2007 season was used in accurately troweling all the trenches, numbering and mapping the post molds and their diameters, and excavating Feature 1 in Trench 1 to the north. This feature was a simple humus filled pit containing small amounts of trash. Features 2 and 4 were defined in the northern end of Trench 5 and Feature 3 was only partially exposed in the southern wall of Trench 1, just south of Feature 1. It was not excavated.

Thus by the end of the 2007 season, the following had been accomplished. A partial new contour map of the site had been created using 865 elevation points. The core area had been shovel tested by 179 tests. The number of post molds located was 176. These were mapped in six separate trench excavations. Although there were some possible lines in the cluster of post molds in the main trench areas, they clearly were too complicated to delineate with expanding the excavations. Finally, four features had been located and one of them excavated.

The most certain conclusion of the very successful 2007 season was that we absolutely had to come back in 2008 to continue to expand the excavations around the block that was forming that was yielding so many post molds.

Plate 3. 2007, Field Crew.

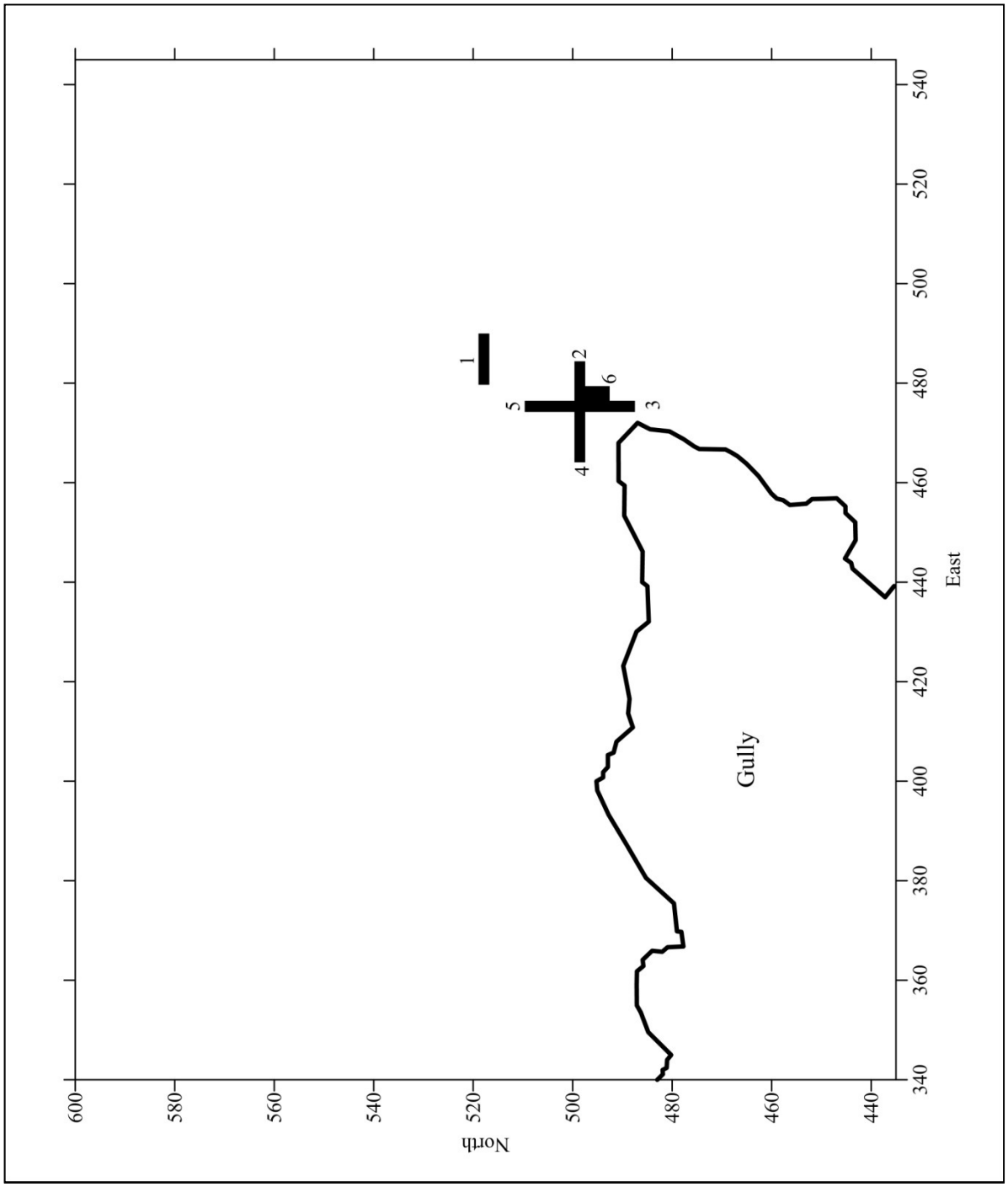

Figure 12. Trench Locations 2007 (Grid in Meters).

Plate 4. 2007, Trench 4 Excavation.

2008 Season Overview

In the 2007 season, all the back dirt from the trenches had simply been placed adjacent to the trenches themselves. It was clear from the outset of the 2008 season that in order to continue our work defining the post molds, all this dirt would have to be moved away. We moved all the dirt adjacent to Trenches 2-6 (now Excavation Unit 2) using wheelbarrows. Three large back dirt piles were created to the north, south, and northwest of the main work area by about 20 meters. Trench 1 from the 2007 season was backfilled at the beginning of the 2008 season, since it was clear that our work would not be expanding in that location.

The goals of the 2008 season were to expand the center trenched area and thus create a large block excavation, to add some additional shovel tests on the southern, western, and northern sides of the unit, and to add additional elevation points, primarily in the western side of the site. We also added a few 2 meter square excavations (4 total) south and southeast of the growing main block where shovel tests showed unusually high numbers of sherds.

The main focus of 2008 was clearly the large block excavation, Excavation Unit 2. The 2007 unit was expanded in almost every direction, although the largest expansion was to the east. By the end of the season the block was approximately 271 square meters in size, counting what had been excavated in 2007. By the end of the season, the total number of numbered post molds from the site was 446.

It is well known in the Georgia Piedmont that areas exposed to the atmosphere for an extended time will reveal new post molds. Why this is case has never been determined, but the process is certain. In the area from 2007 approximately 20 new posts molds were located in 2008. All of the post molds were shot in using a total station from 500 North, 500 East. The diameters of all were recorded, and all were probed to estimate their depths with an Oakfield 1 inch steel corer. None were excavated.

It was clear from the maps immediately available that there were many structures represented in this massive cluster of post molds. It also was clear that the structures represented here were too large for normal family habitations. The clearest building was likely a round one, although there were fragments of rectangular structures present also. Clearly this area was a special location where structures had been built and rebuilt for many years. In short, it showed all of the same patterns displayed from the Bullard Bottom site discussed earlier.

As part of enlarging Excavation Unit 2, eight additional features were located. These were numbered Features 5-12. Feature 5 was near the center of the block with the area of highest post mold density. It was not excavated in 2008. Features 6-12 were all in a line in the area northeast of the core area of post molds. All of these were excavated in 2008.

About 8 meters south of the southwestern part of Excavation Unit 2, a single shovel test showed an unusually high number of sherds. I decided to place a 2 meter square in this area and to screen the fill (using 1/4 inch mesh) in hopes of recovering a large number of sherds. A large feature, Feature 10, was located in the northeastern corner of this square. In order to be able to excavate this feature we placed a second 2 by 2 meter unit overlapping by 1 meter the northeastern corner of the first square. This second unit was not screened. This entire unit was then designated as Excavation Unit 3,

while the screened southwestern square in this unit was called Screened Square 17. This was based upon extending the numbering system from the 16 screened 2 by 2 meter squares that were excavated in 1991. The sherds from those squares are already curated at the University of Georgia Laboratory of Archaeology (Williams 1991). The feature eventually proved to be a tree stump, and the number of sherds was less than had been hoped.

To the east from this location another 2 by 2 was excavated and screened (using 1/4 inch mesh) for the same reasons as Excavation Unit 3. This unit also revealed the presence of a small feature, Feature 11. In order to excavate this feature, a small offset was necessary on the western side of the original square. This offset was not screened. This entire excavation was labeled as Excavation Unit 4, while the screened square was labeled as Screened Square 18. The feature also turned out to be a tree. Figure 12 shows Excavation Units 2-4 as they appeared at the end of the 2008 season.

A single 2 by 2 meter excavation square was placed by itself well south east of the main work area on the site based upon a single shovel test from 2008 that yielded over 450 grams of pottery. This square was placed over this in hope of recovering a significant amount of pottery. Relatively little was located and the anomalous shovel test in still an enigma. The center of this square was 475 North, 515 East. The square was named Screened Square 19.

An additional 112 shovel tests were made on the eastern and northern parts of the core area of the site during 2008. These permitted us to get much better control on the patterns of sherd distribution on the site (as well as teaching students about the fine art of digging shovel tests!). After the 2008 season the total number of shovel tests was 291. All the shovel tests were 30 cm in diameter and excavated to sterile red clay, typically at 30 cm depth. All were screened using ¼ inch mesh hardware cloth.

An additional 562 elevation points were recorded in 2008. These added to the 865 from the 2007 season created a data set of 1427 points.

In 2008 a series of four different remote sensing techniques were applied to the site, ground penetrating radar, differential proton magnetometry, resistivity, and metal detector. Before the magnetometer could be attempted, the area northeast of Excavation Unit 2 where the work was attempted had to be cleared of a great many nails and other metal remnants from 20th century deer hunters who had camped at the site. The metal detector worked admirably for this purpose. The magnetometry work was carried out in a block that was 18 by 19 meters in size (500-517 North, 477-495 East) (Figure 13). A few anomalies were noticed, but none were deemed worthy of excavation (Figure 14). The machine used was one built by the author. The subsurface radar work was conducted in the same area by archaeologist Dan Elliott of the Lamar Institute using his own equipment. This also yielded no significant results according to him, except to show the existence of a former very shallow field road. Finally, attempts at using electrical resistivity at Copeland were completely unsuccessful since the soil at the site has one of lowest resistances to electrical current flow of any site known in Georgia. The equipment used for the resistivity attempt was a 4-probe unit designed and built by the author (Williams 1984).

Plate 5. 2008, Field Crew.

Plate 6. 2008, General View of Site Looking West.

Plate 7. 2008, Excavation Unit 2 Excavation.

2009 Season Overview

The primary goal for the 2009 season was to excavate all the post molds located in Excavation Unit 2. This was undertaken to recover artifacts from all the holes to attempt to understand the date of creation for the several structures represented by the post patterns. All of the post molds were so excavated and several surprises were discovered. Further, some additional post molds were, not surprisingly, located in the Excavation Unit 2 block area from the 2008 expansion. These were also excavated. We did not excavate post molds defined in any other excavation units since no potential structures were noted in them. I believed that excavating them now might compromise the ability of future archaeologists to locate structures in those areas.

In order to check for the possible existence of any palisade wall surrounding the core area, a new trench was excavated away from the Excavation Unit 2 block to the east. This unit was labeled as Excavation Unit 5, and also was called the Eastern Trench. This unit was 15 meters by 2 meters in size and ran from 495-497 North and 490-505 East. A few post molds were located in the unit, but not many. There was no evidence of a palisade line through the unit. There were two small features located in the center and western end of the unit, Features 13 and 14.

A total of 92 additional shovel tests were added to the total from 2007 and 2008. These brought the three year total to 383. The new post molds were placed on the peripheries of the area already shovel tested. The actual idea for these tests was an attempt to better define the presumed drop off of ceramics away from the center area of the structures (Excavation Unit 2). While this was generally accomplished, one large anomaly in the ceramic density pattern was revealed. This was in the extreme northwestern part of the site some 100 meters away from Excavation Unit 2. While we had generally been placing shovel tests at 10 meter intervals in the periphery, I decided to place some at 5 meter intervals in this new area to attempt to better define the higher density of ceramics in this small area.

Near the end of the 2009 season, I decided to place a small excavation unit in the roughly defined center of the area. The new excavation unit consisted of just two 2 meter squares in a north-south alignment. This new excavation was labeled Excavation Unit 6. Both squares were screened to recover artifacts using ¼ inch hardware cloth. A rough line of post molds were noted in the southern of these two squares. No time was available in 2009 for further examination of this area. The importance of this area is that it is the only place on the site other than Excavation Unit 2 where post molds have been discovered. Clearly this area should be examined further at some point in the future.

On Figure 12 Excavation Units 5 and 6 were added during 2009. The other units were not changed in size or shape.

Plate 8. 2009, Field Crew.

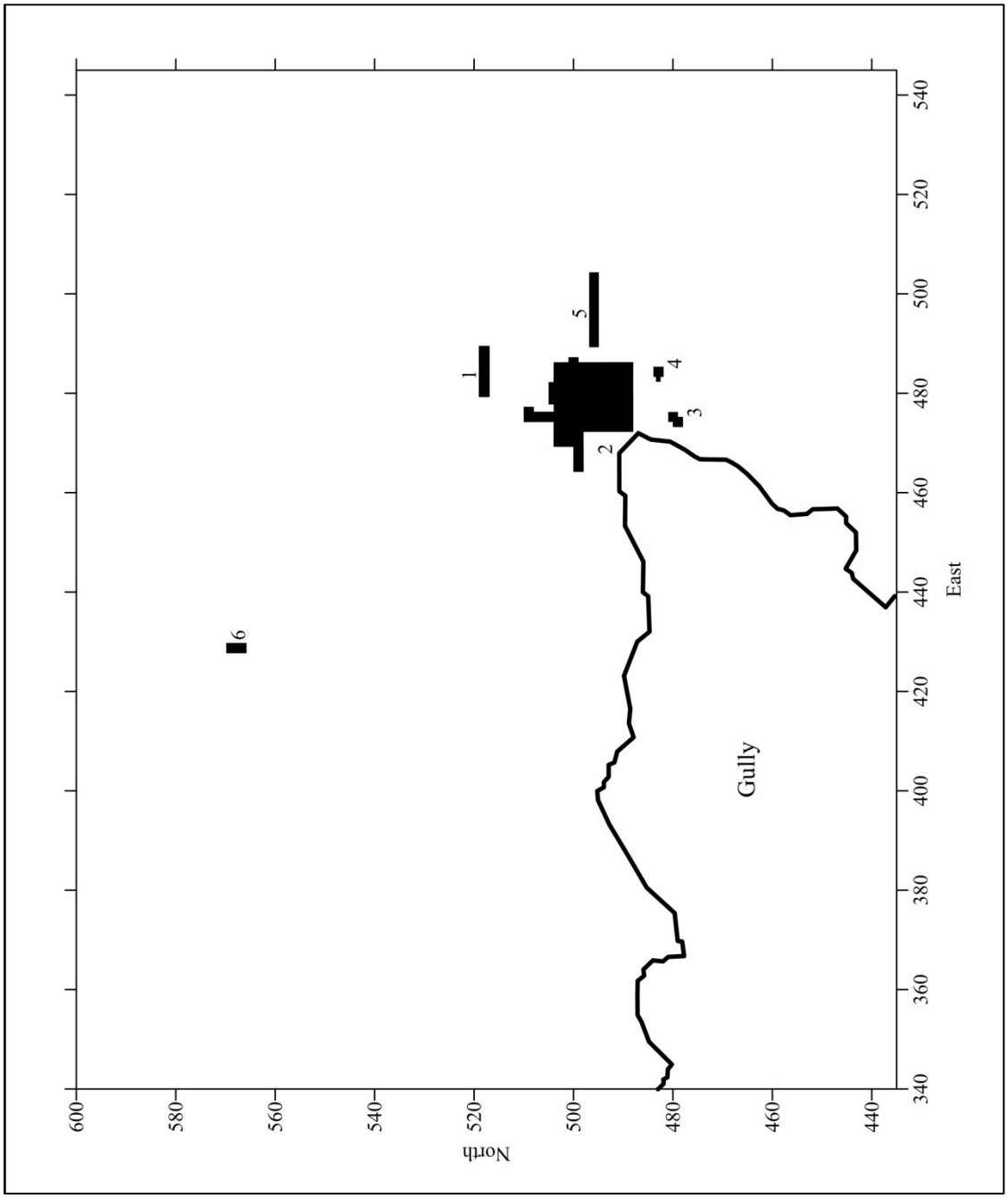

Figure 13. Final Excavation Unit Locations (Grid in Meters).

Magnetometer Project

In 2008 a brief magnetometer project was attempted at the Copeland site. The project was fraught with difficulties and was not of much help in understanding the site. It is reported here for the record. I do not believe that additional such research at the site would be productive.

The machine employed was a differential proton magnetometer designed by Woody Williams and the author. It has been employed successfully on many other sites over the past 30 years. The area that was investigated was northeast of the major block Excavation Unit 2. One of the biggest problems with the use of the magnetometer at Copeland was that there are a great many nails or other iron debris present in the center of the site, almost all left by hunters over the last 30-40 years. Most had apparently been used to create deer stands and other hunting camp related activities. We used a metal detector to locate and remove as much of the modern iron as possible, but I am not certain, with hindsight, that we found it all. Well over 100 nails were recovered.

The exact area investigated was from 500-517 North and 477-495 East. Readings were made at 1 meter intervals in this gridded area yielding 18 rows by 18 columns or 324 values. Figure 13 shows the location of this area and its proximity to the huge gully at the site. This base map, focusing on the center of the site, will be used for a number of maps later in the report.

Figure 14 shows the data from the test as a density map. The high magnetometer values are in yellow and the low in blue. A number of anomalies are shown in the southwestern and northeastern parts of the unit, while the center area appears to be relatively clear of anomalies. The northern part of Excavation Unit 2 eventually was expanded into the magnetometer area studied in its southwestern part. While several features were indeed located in that area, they did not match up well with the magnetic anomalies shown for that area. Several of the anomalies located seemed very intense, and I suspect they might represent undiscovered nails or other metal scrap in the area.

I find it somewhat interesting that in the upper middle of the Figure 14 map there appears to be a sloping area that runs from northwest to the southeast across the unit. What this may mean is unknown, but it may ultimately correlate with some aspect of the structure of the central activity area at the site. To determine if this is real or accidental, however, the entire area subjected to magnetometer inspection would obviously need to be excavated.

In general, I was not very impressed with the quality of the magnetometer project at Copeland. Much of my disappointment, however, relates to the presence of so much 20^{th} century metal at the site.

Incidentally, we attempted to use resistivity at the site in 2008 and gave up quickly when it was determined that the soil there was of such low resistance that the likelihood of discovering anomalies was essentially zero.

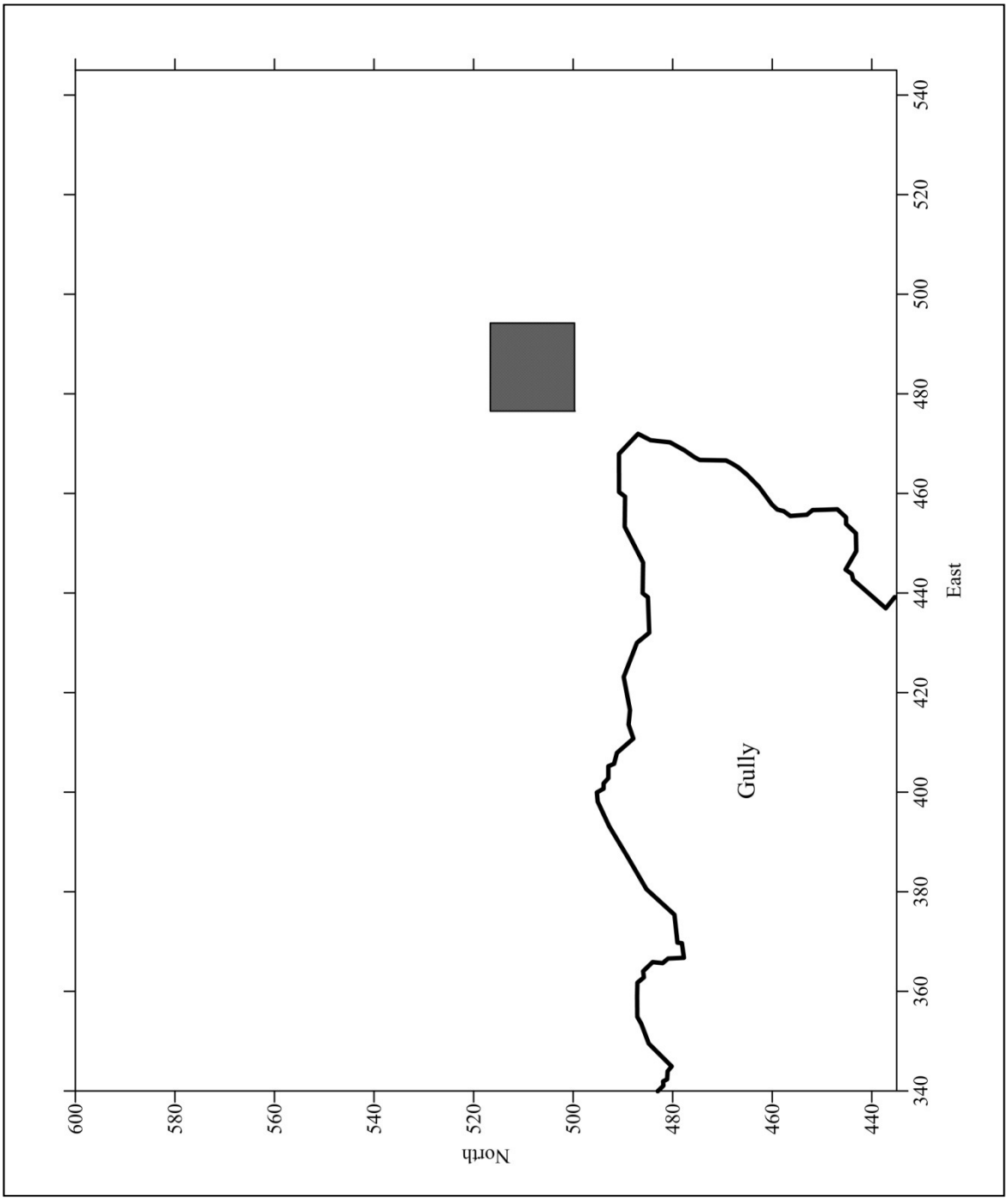

Figure 14. Magnetometer Study Area (Grid in Meters).

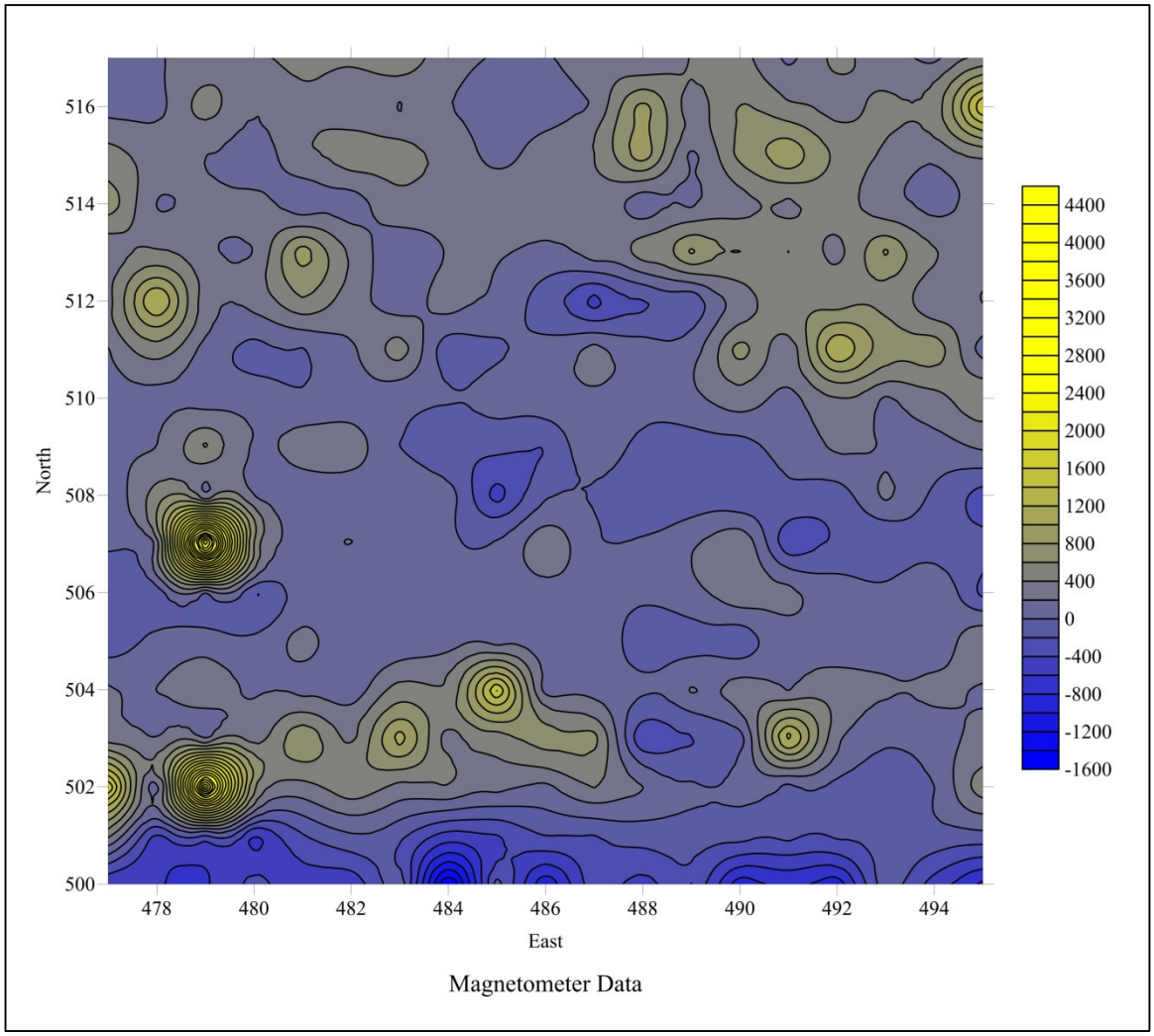

Figure 15. Magnetometer Map (Grid in Meters).

Phosphate Project

The phosphate levels in the soil on an archaeological site are a function of the amount of food debris and human waste deposited there in the past. Phosphate can concentrate in the earth as a result of food preparation or cooking activities, consumption related activities, or trash disposal activities. In 2008 I decided to implement a simple phosphate testing project on soil samples from the Copeland site. This was attempted for several reasons. First, I knew that one of the few other such analyses of this type had been performed in 1978 at the nearby Cold Springs mound site on Forest Service land (Shirk 1979). Second, I was curious about the relative amount of phosphate at Copeland in the center area of the structures as opposed to the area surrounding them. With all the features to the northeast of the structures, I thought this might be a food preparation area. Third, the testing of phosphate has become a bit simpler over the years as attested by a growing number of publications (e.g. Parnell 2000 and Parnell, Terry, and Golden 2001). Finally, I wanted to use the technique as a teaching tool for the field school students. The results of the test were better than I could have imagined.

The soil samples were made at major grid points in the center of the site. The upper portion of the humus, including leaves, sticks, etc., was scraped away, and a trowel of soil was excavated using a cleaned trowel. The samples were placed in paper bags with their recorded locations. In the lab, the soil samples were air dried for at least a week before attempting to process. The soil was then fine screened to remove any small rocks and other obvious extraneous material.

The small cleaned soil samples were then processed using the Mehlich 3 process. This involved treating the sample with a series of chemicals designed to extract the phosphate from the soil. The end result of this process was a clear liquid that contained the extracted phosphate from the soil sample. All of our methods were derived from the published descriptions of Parnell [2000] and Parnell, Terry, and Golden [2001]. These authors used the older Mehlich 2 process (Mehlich 1978), which has now been updated (Mehlich 1984, Hesterberg 2004). In general, all of these procedures are designed to be simple enough to be used in the field, but we elected to perform the tests in the lab.

This liquid was then mixed with a dye that turned a different shade of royal blue depending on the amount of phosphate in the sample. The clear blue liquid in a glass vial was then placed into a Pocket Colorimeter II made by the Hach Company, and a digital readout of the relative quantity of phosphate was recorded. We discovered that, in general, the soil at Copeland was very high in phosphate and we had to dilute the sample with distilled water to keep from causing all samples to exceed the capability of the colorimeter.

In the end 39 samples were processed. In two cases two samples were taken from the same location. These values were averaged for the analysis. Thus 37 samples were available for mapping at the Copeland site. The values for these are shown in Appendix 4. The general area of the phosphate project is shown in Figure 15 and a density map made from all the 37 values is presented in Figure 16. This figure also shows the exact location of the samples as dots.

The pattern of phosphate values as presented in Figure 16 is one of a center area of relatively low values surrounded by an area of higher values. The low center area

includes the location of the structures in Excavation Unit 2, and the area to the northeast of these structures. My interpretation of this pattern is that less food was likely produced and consumed in the center structures located in Excavation Unit 2. Curiously, there is some midden in the features northeast of the structures in this area of lower phosphate. I assume that the lower amount of phosphate in the center area does not mean there was no consumption of disposal of food near the center, but simply less. Another possibility is that the center area, including the area of structures, was kept intentionally cleaner than the surrounding area. The highest values in the southeastern part of the map might have been augmented by activities of modern hunters, but this is unknown.

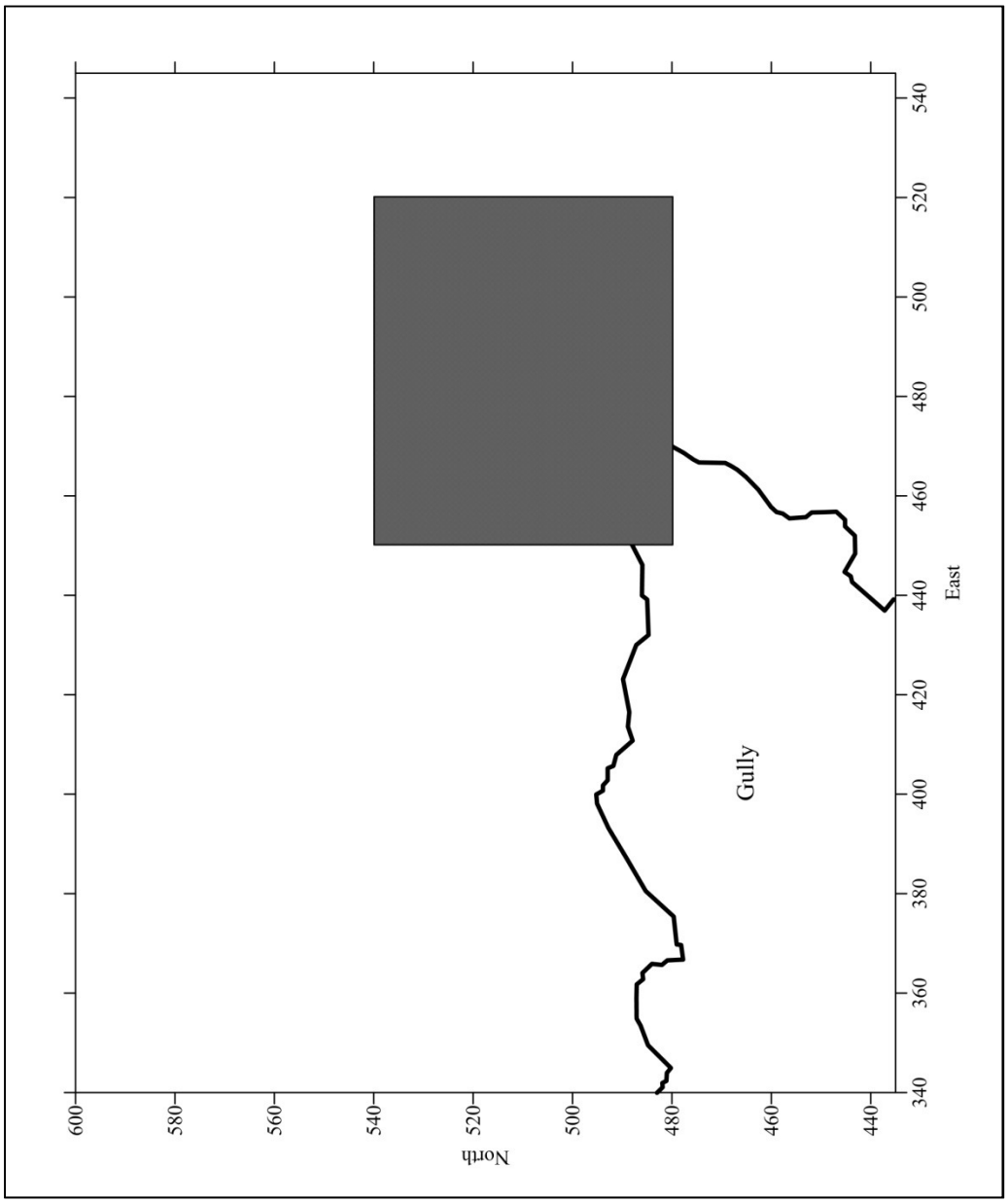

Figure 16. Phosphate Study Area (Grid in Meters).

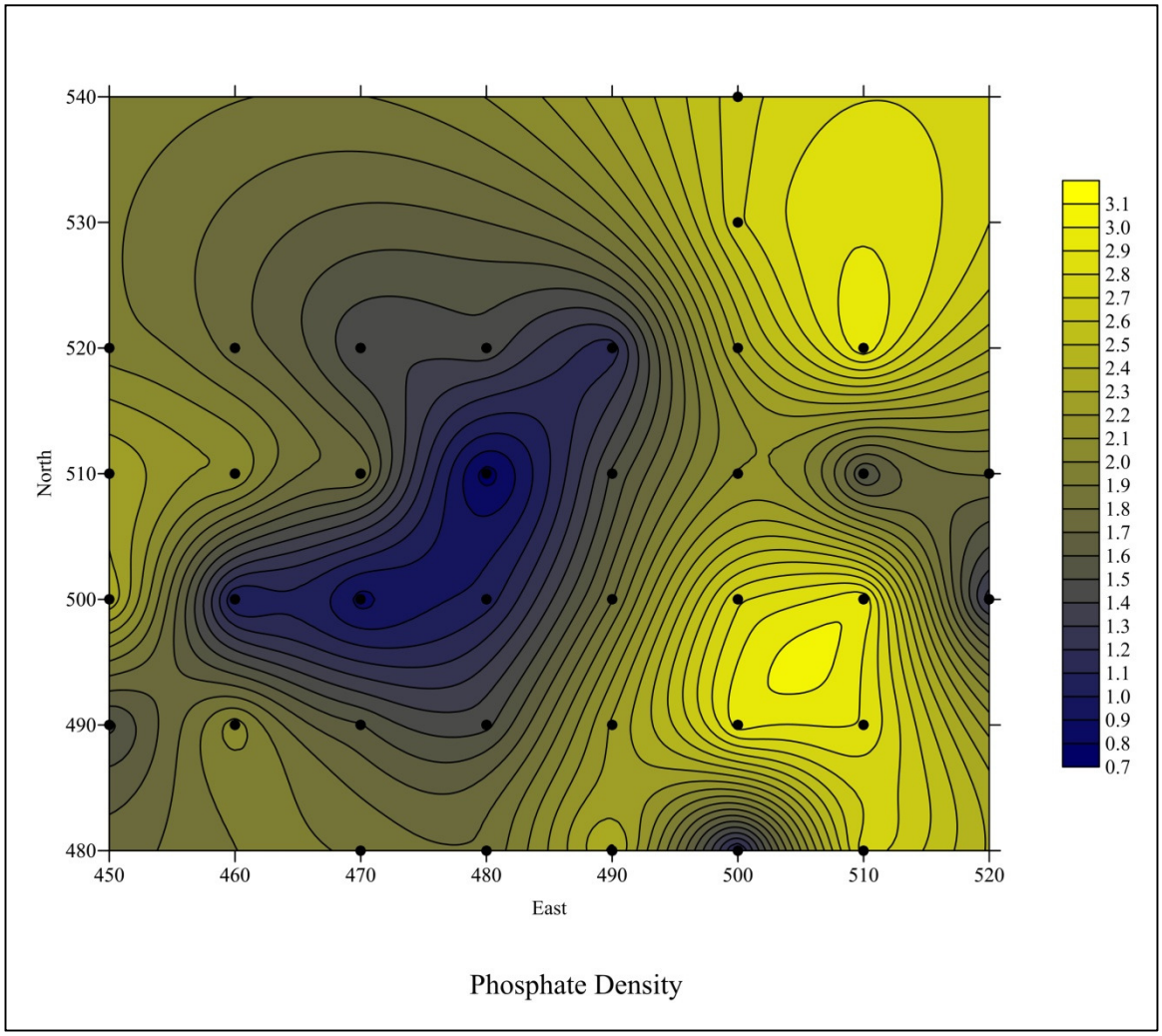

Figure 17. Phosphate Density Map (Grid in Meters).

Shovel Test Project

From the beginning I wanted to place many close interval shovel tests to help determine the pattern of distribution of material culture items in the center area of the site. We certainly knew that this was the major concentration area of artifacts from the earlier studies of the site, but I hoped that some useful patterns might be revealed that would aid in our study of the site. I also wanted to train the students for their future careers in Cultural Resource Management.

Thus in 2007 we placed 179 shovel tests in the center of the site. These were centered on what became Excavation Unit 2, and were approximately 5 meters apart in a gridded pattern. The locations were placed roughly with tapes, but the exact locations of all of the tests were then shot in with a total station. All tests were taken to sterile red clay and averaged 30 centimeters in diameter. The soil from all the tests was screened through ¼ inch mesh hardware cloth to recover artifacts. The tests were numbered as they were excavated. Flagging pins with numbers written on them were placed in all shovel tests until they were mapped with the total station.

During the 2008 season an additional 112 shovel test were excavated. These were made primarily in the eastern and southern parts of the center area, and expanded upon the 2007 work. During the 2009 season, 92 more shovel tests were excavated. These were placed on the perimeter in all directions, especially in the north and northwestern parts of the center area. The total number of tests from all three seasons was thus 383. All shovel tests were backfilled after each season. The artifacts from each test were washed and analyzed at the University of Georgia Laboratory of Archaeology in Athens.

Appendix 1 to this report lists the exact grid locations for all the shovel tests as well as the total number and weight (grams) of ceramics from each test. Appendix 2 lists the lithic items recovered from all 383 shovel tests. Finally, Appendix 3 lists a variety of other miscellaneous artifacts recovered from the shovel tests. The huge and detailed data set on sherd types from all the shovel tests was too big to present as a table in an appendix. It is available at the University of Georgia Laboratory of Archaeology for those interested professionals.

Figures 17-26 present a series of maps based upon the shovel test data. Figure 17 shows all the 383 shovel tests at the scale of the entire site. As can be seen from this map, the work in 2007-2009 concentrated on the center of the site. Figure 18 shows these same 383 shovel tests, but with their diameter being a function of the number of sherds in each shovel test. As can be seen, the major area of high sherd density was at the head of the gully on the western edge of the site. A secondary area of high sherd density was in a small area about 100 meters northwest of this main area. This secondary high density area was not discovered until late in the 2009 season.

This secondary area of high sherd density was an important and unexpected discovery of the 2009 season. Excavation Unit 6 was placed in this area to determine if post molds were present there—they were. Currently the nature of this secondary area is poorly understood in the context of the entire site. It was actually a bit frustrating that it was not discovered until 2009. In order to determine why this sub area was not discovered until so late in the project, I present Figures 19 and 20. These show the center area of the site and the location of earlier projects. Figure 19 shows the 1987 units of Jack Wynn in the center of the site and Figure 20 shows the 1991 units by me, also at the

center of the site. As can be seen, in comparison to the earlier maps, no excavations were placed in the small area of secondary sherd concentration in the northwest part of the site. This area had simply not been tested until late in the summer of 2009. If nothing else, this tends to demonstrate just how small this "hot" area is. As it is currently understood, it is probably less than 20 meters across.

Figure 21 shows all 383 shovel tests from the 2007-2009 seasons at the same scale as the two earlier figures. As can be seen, the interval in the main area at the head of the gully was 5 meters, while on the perimeter, the interval was 10 meters. The new secondary northwestern area has also been checked at 5 meter intervals.

Figure 22 shows a contour map of sherd number from all 383 shovel tests, again at the same scale as Figures 19-21. The contour interval is 10 sherds for this drawing. The two main areas show clearly on this drawing. The main area at the head of the gully seems better defined on its southern or southeastern edge. In fact, it may be straight—in a southwestern-northeastern direction. One interpretation of this main area is a rectangular area about 40 meters square and oriented at an angle to the cardinal directions.

It also appears from this map that the gully seems to have cut into the southwestern part of the density distribution, although this may be misleading. It is just as possible that entire occupation was centered intentionally upon the gully as a major landscape feature. Outside the two main ceramic areas, the distribution of sherds based upon this drawing would best be described as sporadic.

Figure 23 is similar to Figure 22, except that it shows the distribution of sherds from shovel tests by weight instead of number. My experience over the years has been that both techniques usually show similar patterns. In this case I believe that the weight map is a bit more interpretable. The main area at the head of the gully seems to display a more clearly rectangular shape. The low area in the center of this rectangular shape is the exact area where all the structures located in Excavation Unit 2 were located. Figure 24 shows the same map with all of the excavations units from 2007-2009 added. The shape of the northwestern secondary hot area is confusing at best. It seems to consist of a very hot area surrounding a very low area. Outside of the two main areas, there are few clear patterns. In the eastern center area is an isolated linear pattern that runs almost exactly north-south. I have spent many hours staring at these maps, and modified versions of these in Surfer. I usually come to the conclusion that more shovel tests will be needed to make clear patterns. Certainly additional close interval (5 meter) ones on the eastern and northern edges would be desirable if future work is to be conducted at the site. I do not believe that conducting tests at intervals closer than 5 meters is worth the labor expended. At that point full excavation is likely the best prescription.

Figure 25 shows the density of the lithic artifacts from all 383 shovel tests. It should be noted that the amount of lithic material from all the tests was very limited—only 248 items total. There seems to be almost no lithic material from the major excavation area at the head of the gully, but there is some concentration in the northwestern sub area. The only other area that seems to form a concentration of lithic material is on the eastern edge of the area investigated.

Figure 26 shows the distribution of round river pebbles usually associated with cooking activities (Williams 1995b). The items apparently were used to create a "flexible" base over hot coals to aid in the support of ceramic cooking pots. They also

apparently help retain some of the heat and thus added to efficiency of cooking fires. To my eyes there appear to be two areas of distribution. The most important appears to be a somewhat circular area to the northeast of the main structure area in Excavation Unit 2. This may imply cooking and food preparation intended for serving in the structures. Alternatively, it may imply that food preparation and consumption was conducted just northeast of the structure at the head of the gully.

The second area is in the northwest, and just south or southwest of the secondary area of sherds concentrated there. It is too soon to be certain, but, overall, the pattern for pebble distribution seems to be generally similar to, but not exactly the same as the ceramic distribution. All of the patterns were obviously modified by time during the roughly 100 year long occupation of the site.

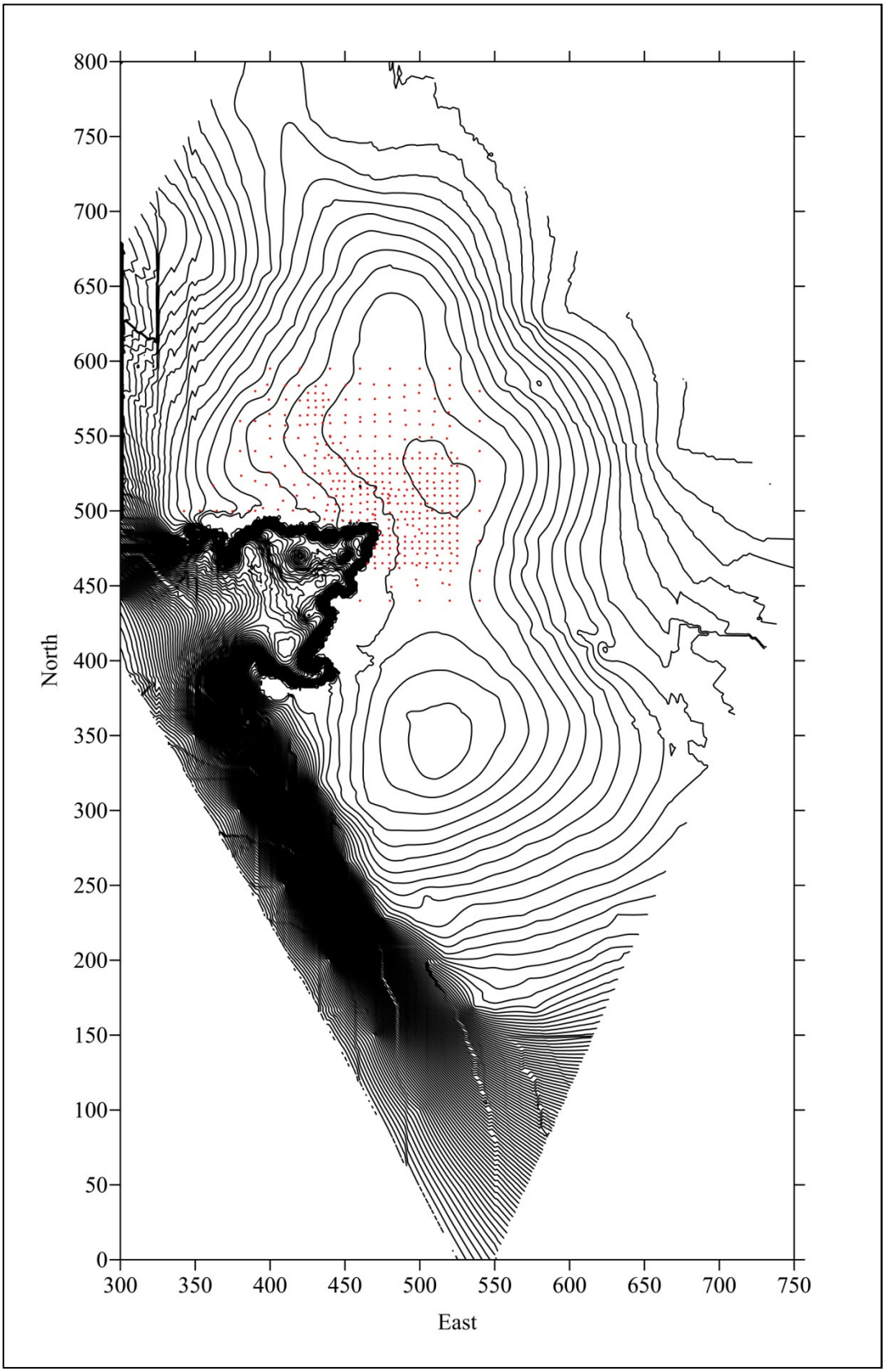

Figure 18. Full Area, 2007-2009 Shovel Test Locations (Grid in Meters).

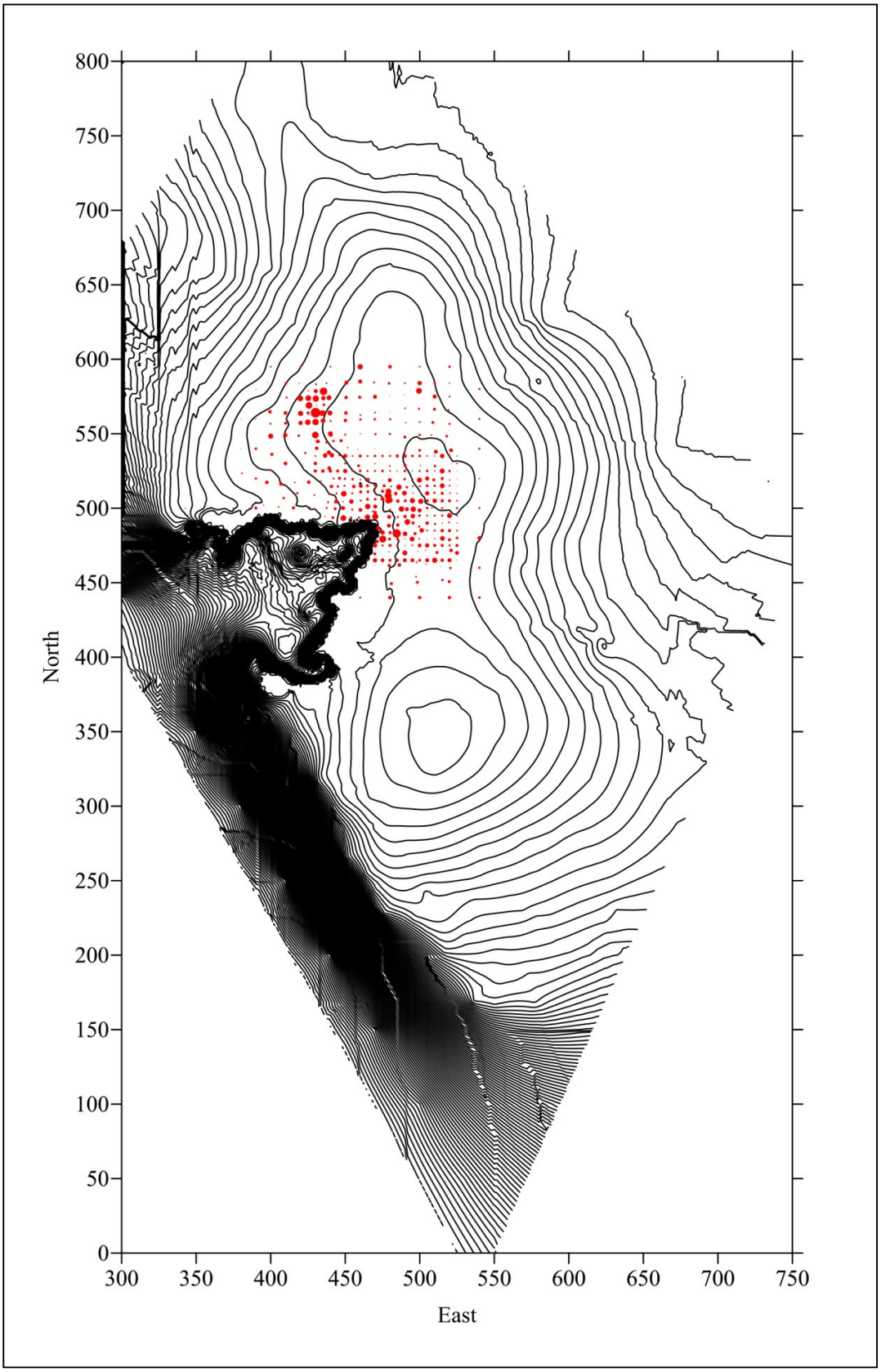

Figure 19. Full Area, 2007-2009 Sherd Density Map (Grid in Meters).

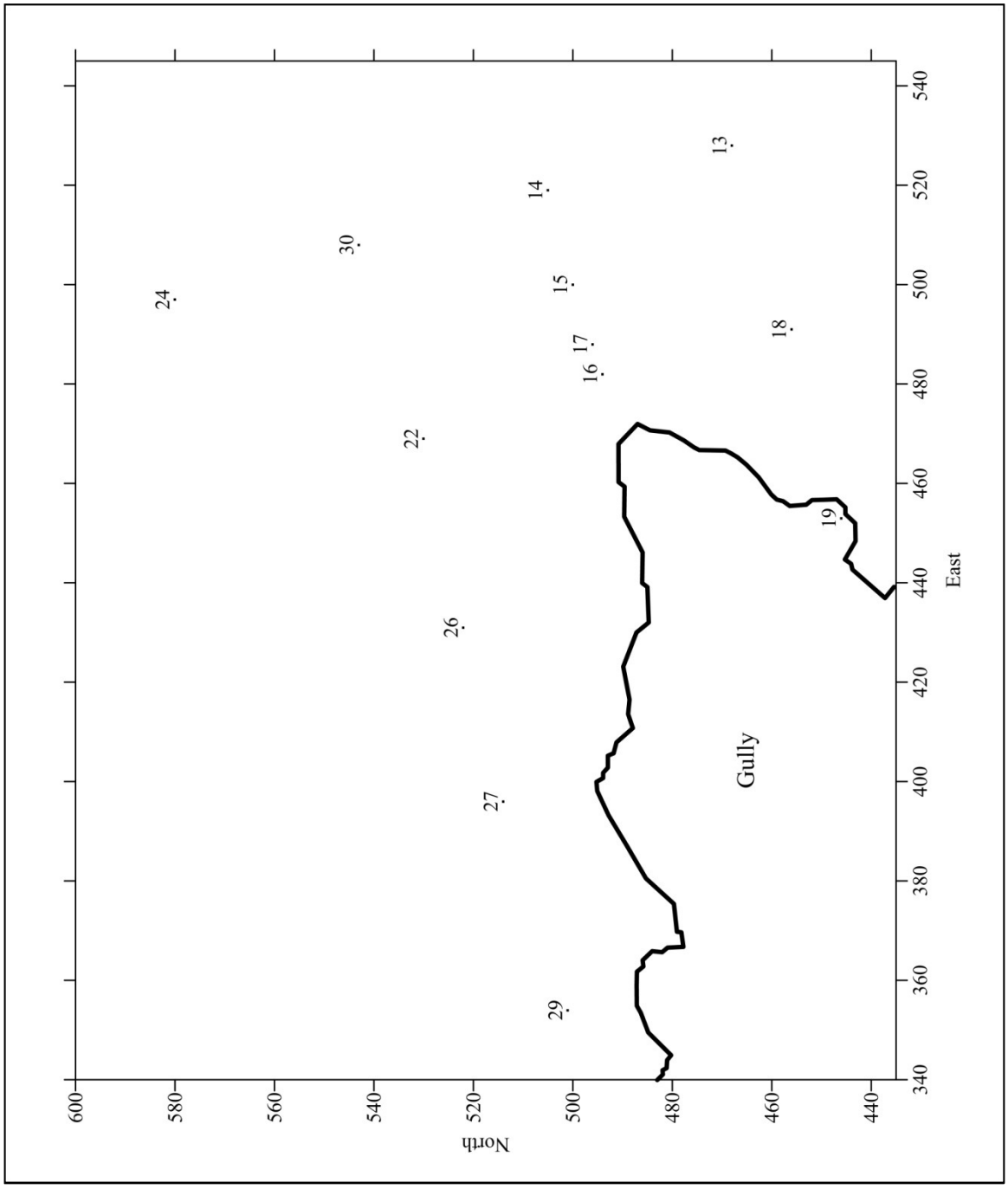

Figure 20. Center Area, Wynn's 1987 Excavation Unit Locations (Grid in Meters).

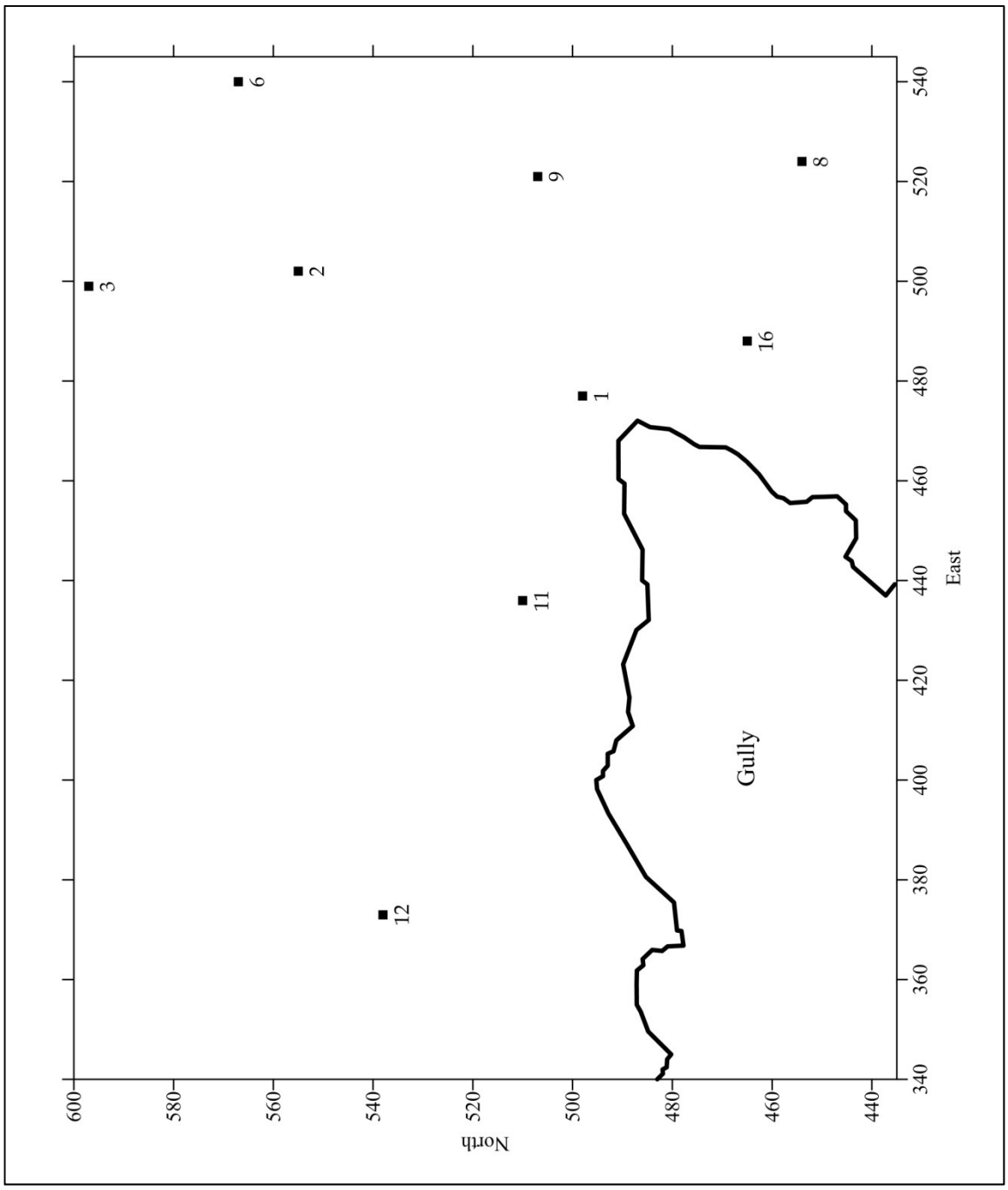

Figure 21. Center Area, Williams' 1991 Excavation Unit Locations (Grid in Meters).

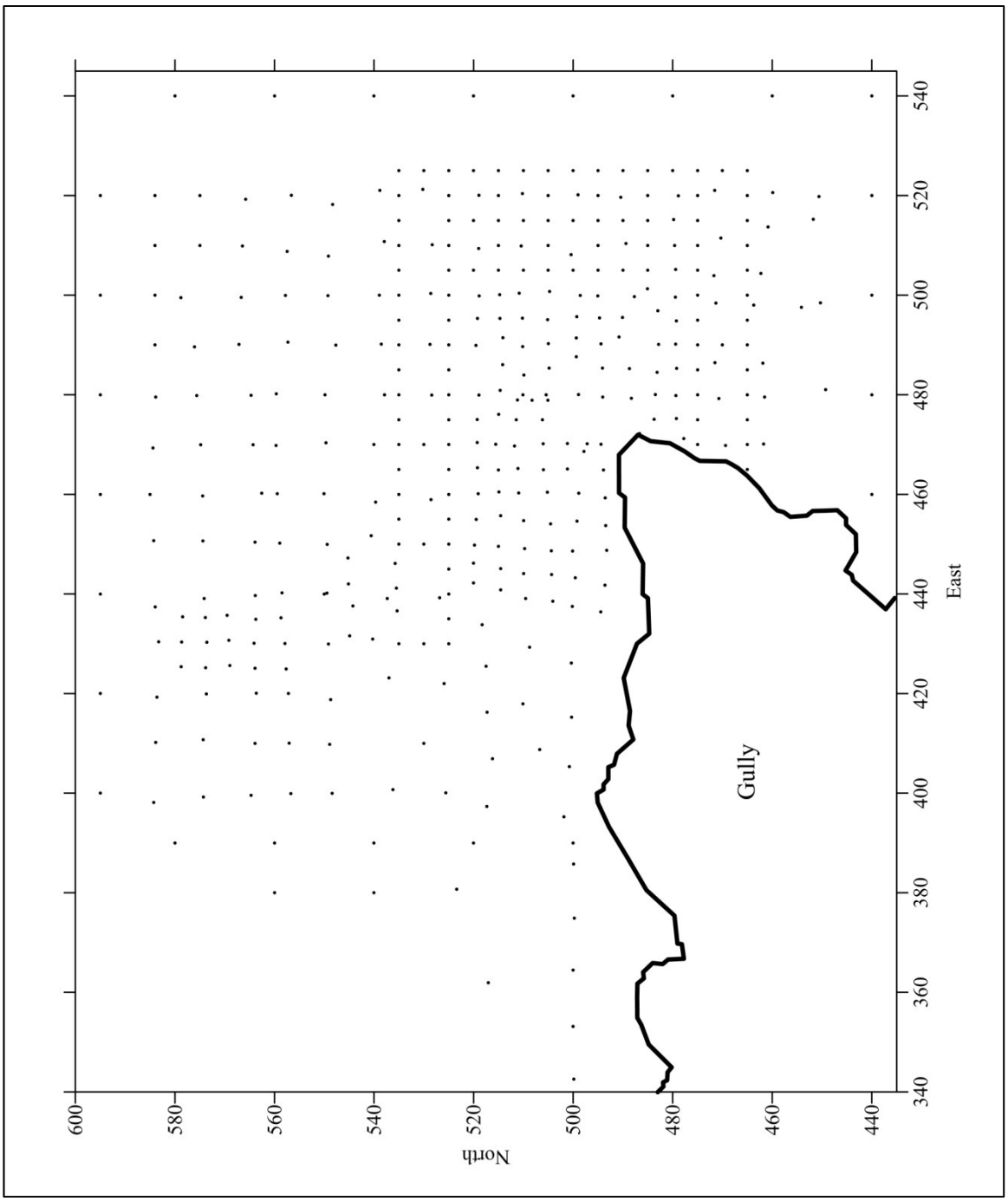

Figure 22. Center Area, 2007-2009 Shovel Test Locations (Grid in Meters).

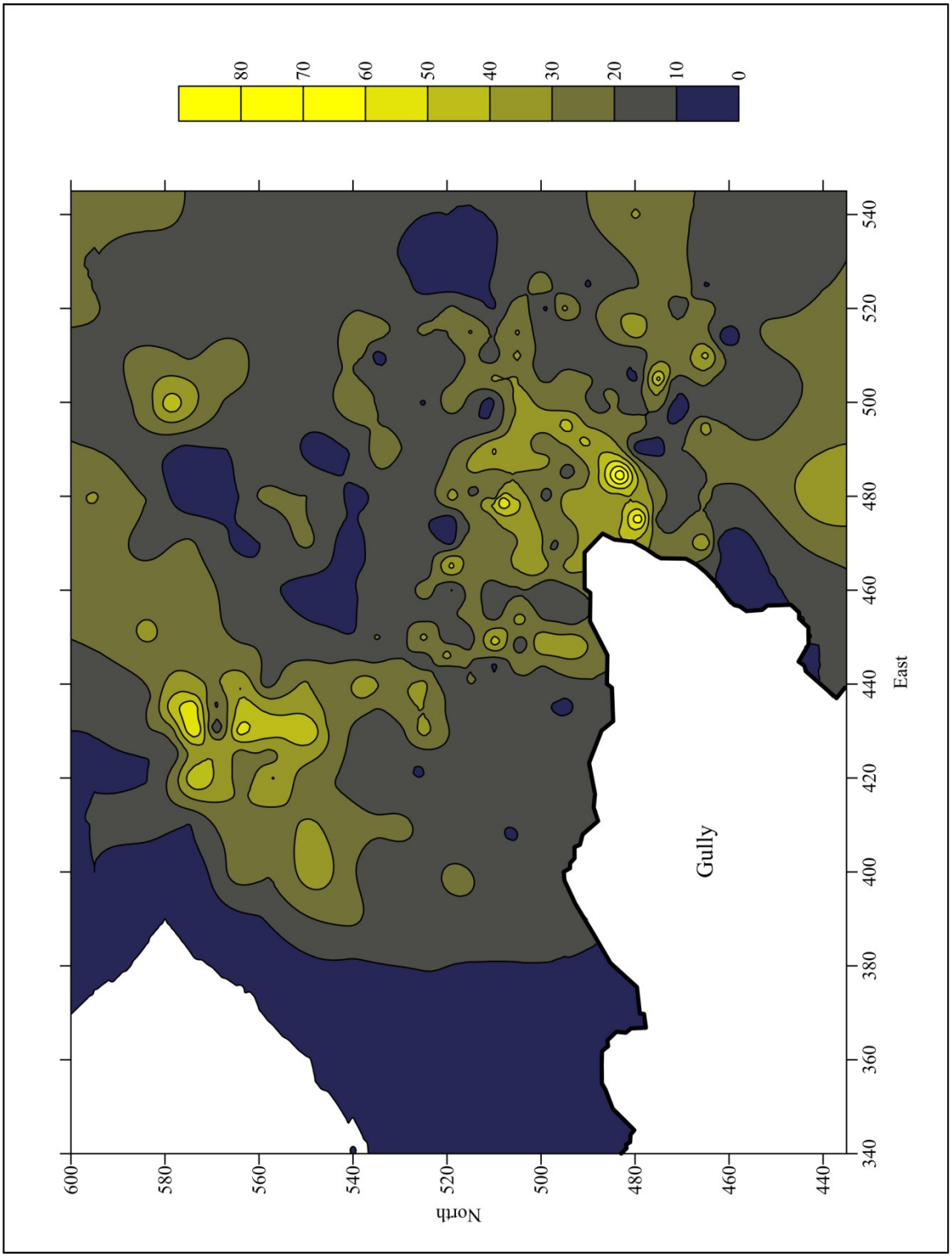

Figure 23. Sherd Number Density Map (Grid in Meters).

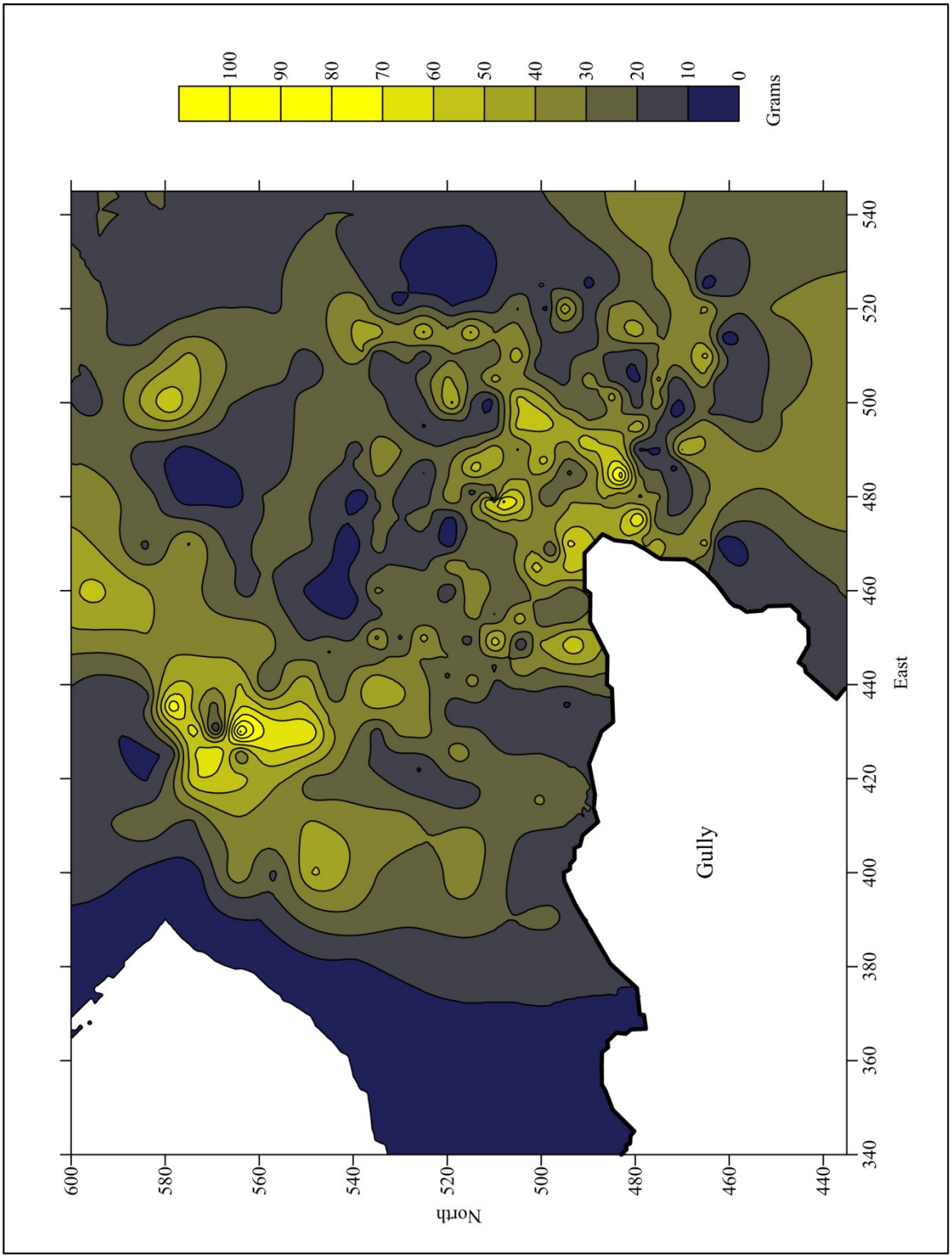

Figure 24. Sherd Weight Density Map (Grid in Meters).

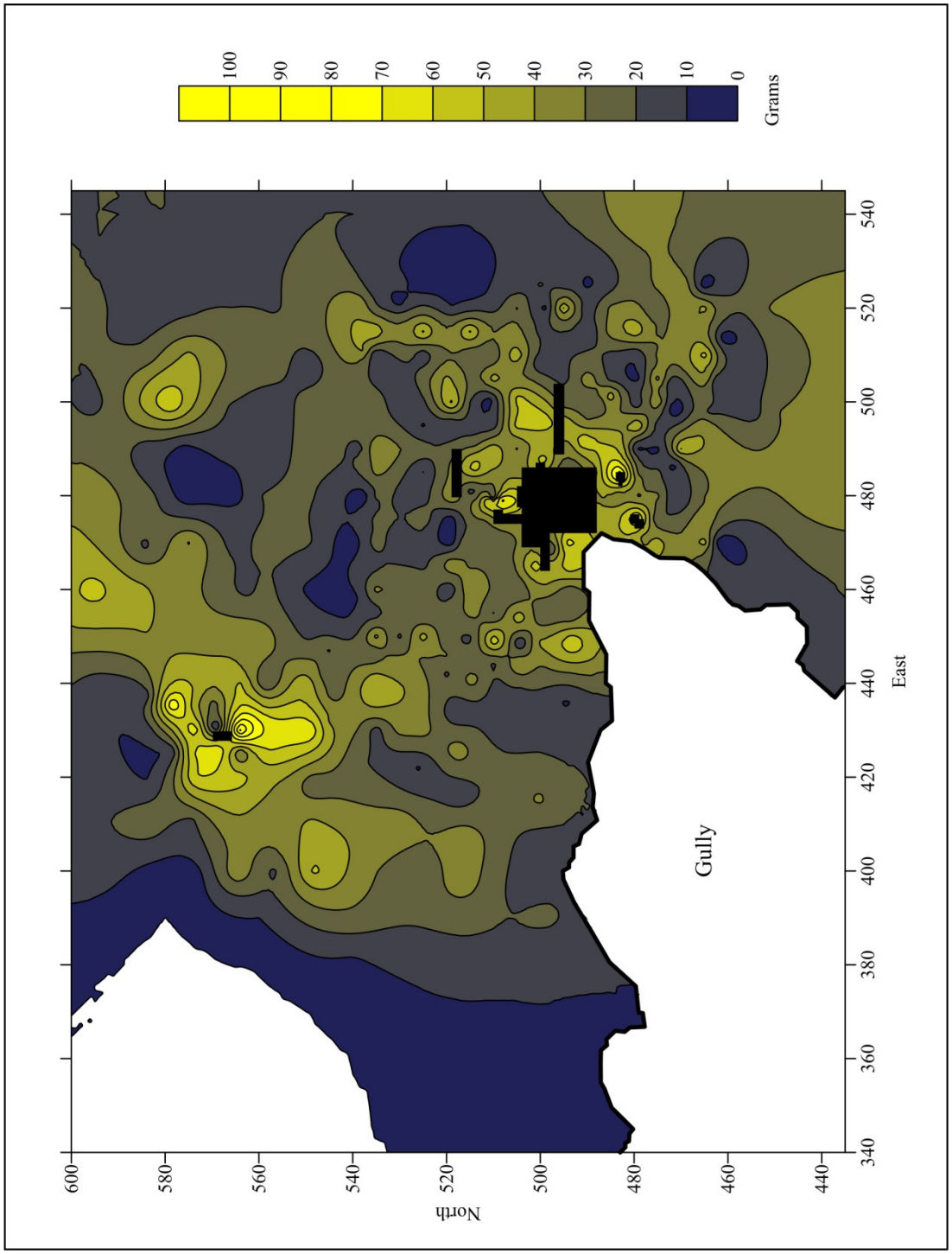

Figure 25. Sherd Weight Density Map with Excavation Units (Grid in Meters).

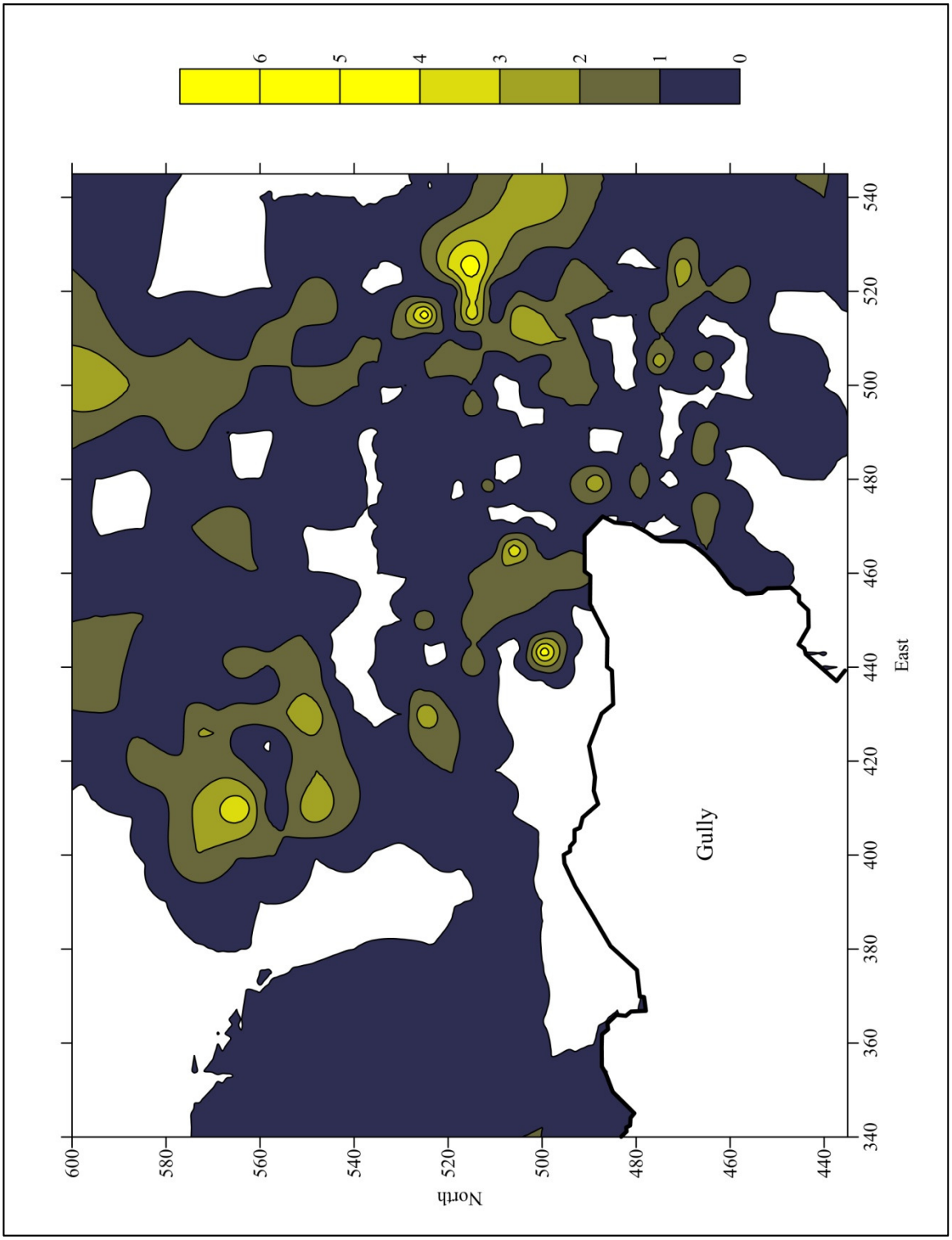

Figure 26. Lithic Artifact Number Density Map (Grid in Meters).

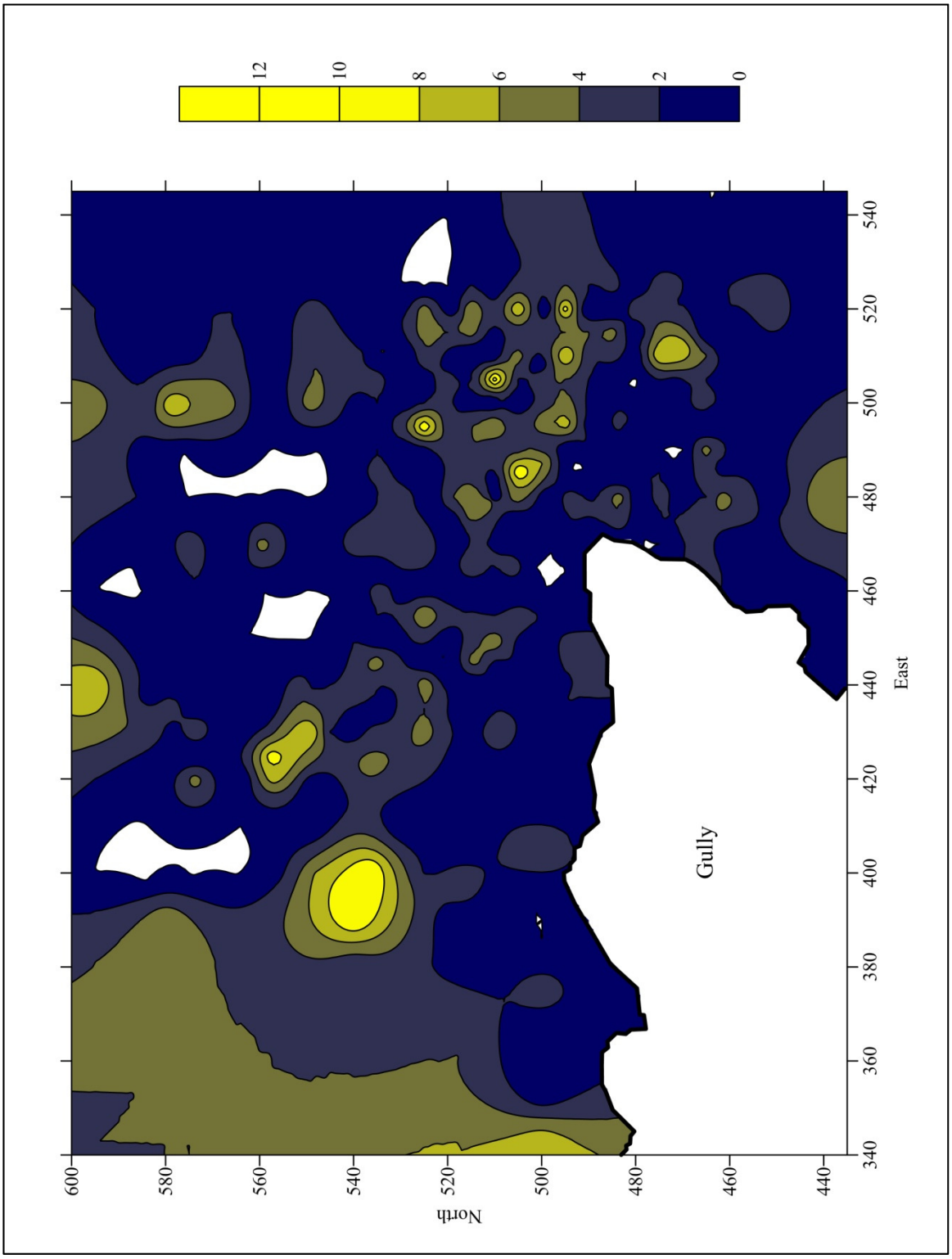

Figure 27. Pebble Number Density Map (Grid in Meters).

Excavation Units Overview

The approach to the excavations (other than shovel tests) was based upon two different objectives. This led to two numbering systems. Further, there was a desire to coordinate the current project with the 1991 UGA project. All of the 1991 excavations were 2 meter squares that were labeled then as Excavation Units 1-16. All were screened with ¼ inch mesh hardware cloth. All the artifacts from the 1991 project were still curated at the University of Georgia when the current project was started, and represented a large collection of the very small sherds (heavily plowed) from the Copeland site.

When we began in 2007 there was little desire to collect and curate large additional numbers of small, mostly unidentifiable, sherds from the site. The goal was to find post molds and structures, if possible. Thus the majority of the excavations in the 2007-2009 project were not screened. A few were however. This led to a need to distinguish the unscreened excavation units from those that were screened. The screened units were all 2 by 2 meter squares. Thus for this report the 2 by 2 meter squares that were screened are labeled as Screened Units and kept numerically separate from the excavated but unscreened areas herein named as Excavation Units. The 1991 excavations then are here called Screened Units 1-16.

As the current project developed, there were a few cases where screening of 2 meter squares was desired. In most cases these became part of numbered larger Excavation Units. The total number of screened 2 by 2 meter squares excavated in the current project was five. These were numbered as Screened Units 17-21, continuing with the 1991 numbering scheme. The first of these became part of Excavation Unit 3 and the second part of Excavation Unit 4. The third (Screened Unit 19) was isolated by itself and not labeled as part of a numbered Excavation Unit for this report. Screened Units 20 and 21 together formed Excavation Unit 6.

The following sections of the report describe the six individually numbered Excavation Units from the 2007-2009 project. Clearly Excavation Unit 2 was the most important, as this is the one that produced almost all the post molds and the only structures found at the site.

As the current project developed, five of the six excavation units were located in the same general area of the site. Figure 27 on the next page shows all of these five with the post molds and features included. Figure 28 shows the same area without the features.

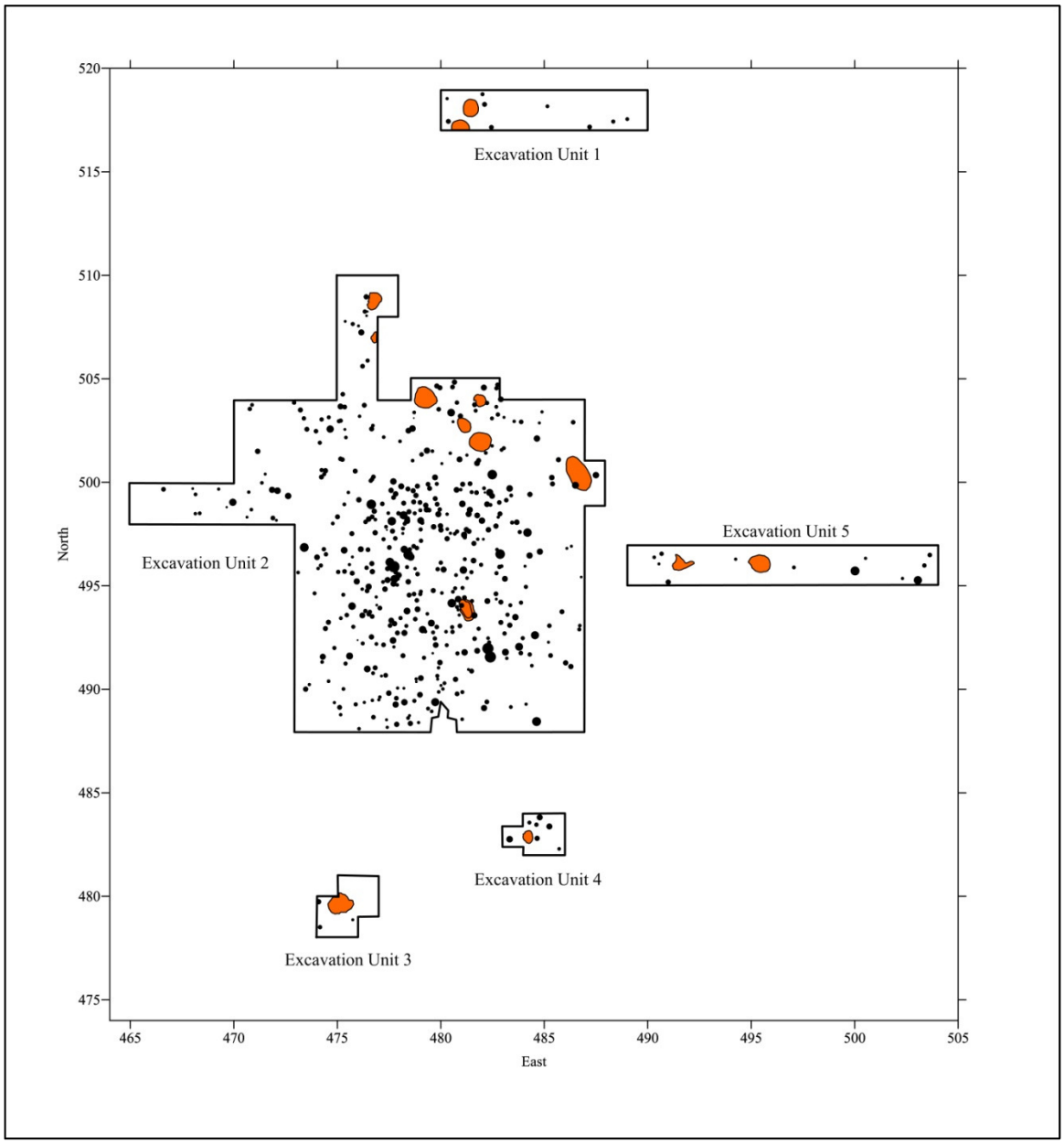

Figure 28. Excavation Units 1-5, All Post Molds and Features (Grid in Meters).

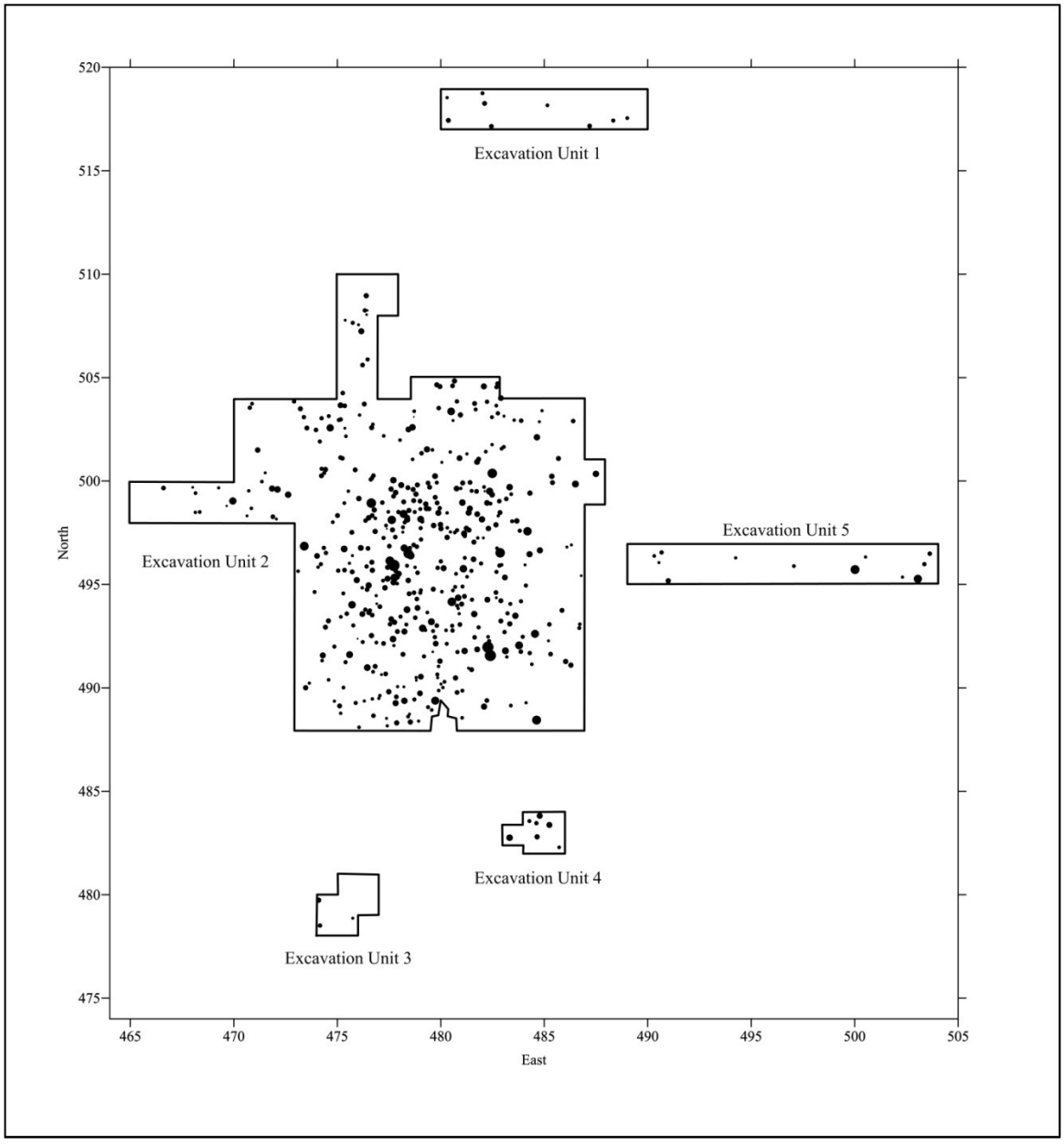

Figure 29. Excavation Unit 1-5, All Post Molds (Grid in Meters).

Excavation Unit 1

This was the first excavation in 2007 and represented the beginning of the project of looking for structures at the site. When first excavated it was called Trench 1. The general idea for this unit was to place a long trench in the grid east-west direction, in hopes that portions of a structure might be encountered. The unit was not screened. The original idea was that the trench might extend many more meters to the west, perhaps creating a trench of as long as 50 meters. The trench as completed was 2 meters wide and 10 meters long. Its grid location was 517-519 North and 470-480 East. The subsoil was much closer to the surface on the eastern end of the trench. There were a few possible post molds in the trench, but none were excavated. Two features were visible in the western end of the trench (Features 1 and 4). One of these (Feature 1) was excavated. The few post molds recorded for the trench did not seem to form any potential patterns. The completed trench is shown here in Plate 9 below. It was backfilled at the beginning of the 2008 season.

Plate 9. 2007, Excavation Unit 1.

Excavation Unit 2

This was the main excavation unit at the site during the three seasons of excavation. It began in 2007 as a series of two crossed trenches with a slight block addition. After locating a large number of post molds that likely formed one or more structures, the majority of the 2008 season was spent enlarging this unit in every direction. The goal of the expansion was to attempt to expand until there were no more post molds visible. This was unsuccessful since a few were still being found at the extremes in every direction. Clearly, however, the bulk of the concentrated area of post molds was located in the excavation unit. As it turns out, I eventually defined nine structures in the post molds located in this area. These are presented later in this report. There were also a series of larger features located in Excavation Unit 2. The majority of these were in the northeastern part of the unit.

The shape of Excavation Unit 2 as completed was very irregular. The southern part of the unit was 14 meters wide. An irregular cutout area in the center of the southern wall of the unit was because of a large tree that was not removed. A few small trees were removed in the excavation of the unit. The main part of the unit was 16 meters north to south. There were some irregular expansions in the northeastern part of the block to permit the complete excavation of several features located there.

Plate 10 on the next page shows students troweling in Excavation Unit 2, on its southern edge. The unit was eventually expanded 2 more meters in that direction to the tree behind the students. Plate 11 show the huge number of post molds located near the center of Excavation Unit 2. Plate 12 shows one of the structures with the post molds marked with paper plates, and finally, Plate 13 show the area of Excavation Unit 2 after the post molds were excavated during the 2009 season.

Plate 10. 2008, Troweling in Excavation Unit 2, Southern End.

Plate 11. 2008, Posts in Excavation Unit 2.

Plate 12. 2008, Clearing Structure 1.

Plate 13. 2009, Excavation Unit 2 after Post Molds Excavated.

Excavation Unit 3

This small excavation unit was placed south of Excavation Unit 2. This was initiated because of a shovel test here that had a high number of sherds. I thought this might be a good location to recover a larger number of sherds, perhaps of larger size, since it was so close to the head of the huge gully (only about 5 meters away). As it turned out the number of sherds and their size was not that different from other screened units in the area. A feature was located in the northeastern part of the floor of the unit (Feature 10). In order to expose the feature completely before its excavation, we expanded the square to the northeast. This expansion to the square was not screened. The feature was then excavated. The feature only contained a relatively small amount of material. There were three possible post molds in the unit. These were not excavated. See Figures 27 and 28 above.

Excavation Unit 4

This small unit was also located south of Excavation Unit 2, and was east-northeast of Excavation Unit 3. It was started as a 2 meter square for the exact same reason as Excavation Unit 3--a high sherd value shovel test had been dug in this area. After the screening of the unit, a small feature (Feature 11) was located on the floor of the unit on its western extreme. In order to excavate the feature, we expanded the unit to the west. The expanded area was not screened. When the feature was excavated it seemed likely to be the remains of a tree. There were a few possible post molds in the floor of the unit, but these were not excavated. See Figures 27 and 28.

Excavation Unit 5

This trench was excavated at the beginning of the 2009 season with a specific purpose in mind. By that point it was clear that we had located the many structures in Excavation Unit 2. I was very curious to see if there might be a wall or palisade that surrounded this core area. Excavation Unit 5 was directed away from the center area to the east to check on this possibility. The grid location for this 2 by 15 meter trench was from 495-497 North and 490-505 East. The trench fill was not screened.

While there were a few post molds located in Excavation Unit 5, there was no obvious palisade line through it. There were a couple of features located in the western part of the unit. Plate 14 on the following page shows the trench while it was being excavated. Figure 27 and 28 show the post molds and the location of the features.

Plate 14. 2009, Excavation Unit 5 under Excavation.

Excavation Unit 6

This was placed in the northwestern part of the site during the latter part of the 2009 season. It was formed from Screened Units 20 and 21. The units and thus the excavation unit were placed here to investigate an unexpected high concentration of sherds in this area well away from the structures in Excavation Unit 2. The grid location for this unit was from 565.6-569.6 North and 427.7 -429.7 East. There were several post molds in the unit, and they were almost completely concentrated in the southern end of the two squares. None of these were excavated. There does seem to be some structure located here, and it should be explored in the future. I will have more to add about this in the section on the artifacts and in the conclusions. It is illustrated in Plate 15 below.

Plate 15. 2009, Excavation Unit 6.

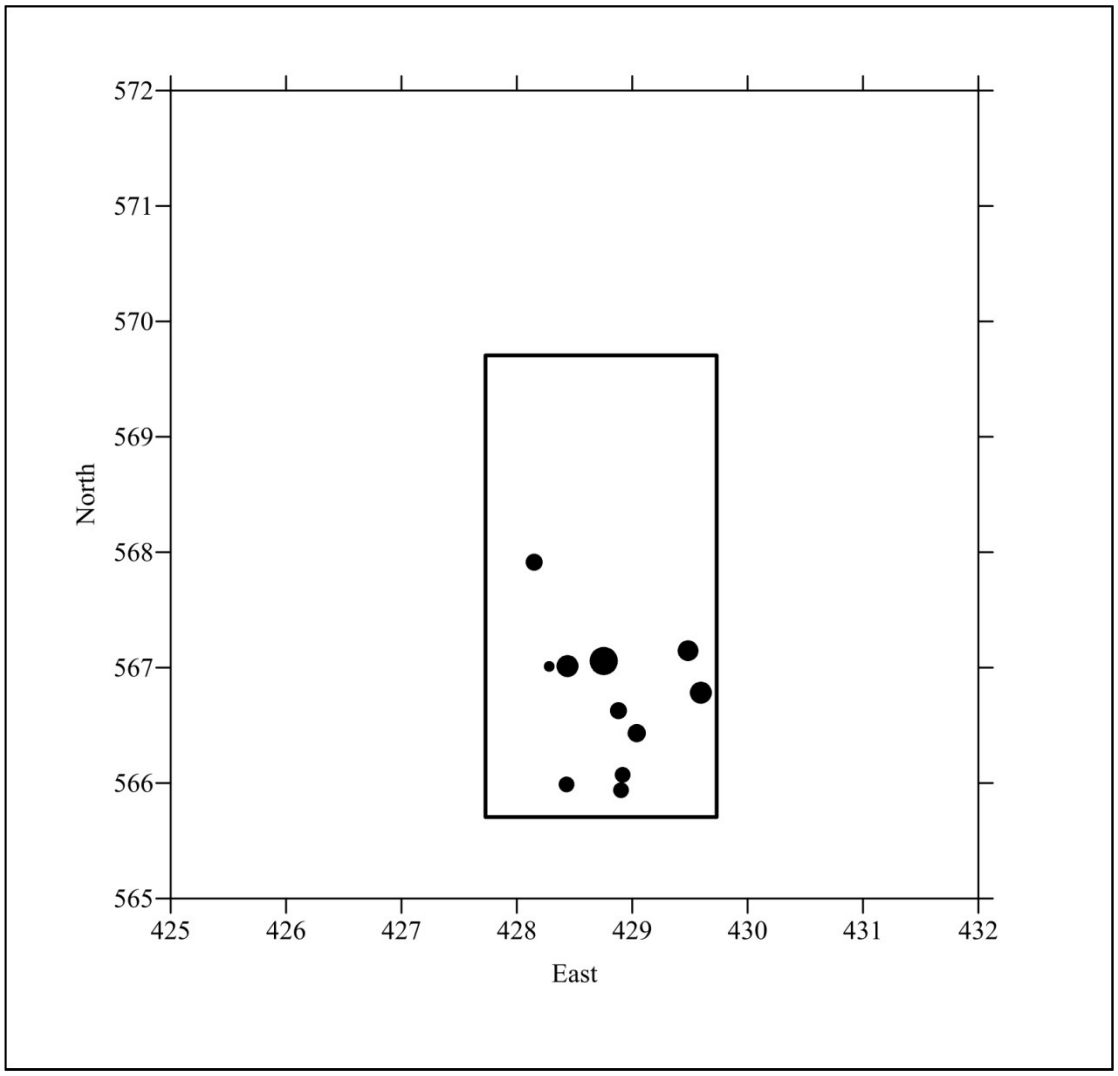

Figure 30. Excavation Unit 6, Post Molds (Grid in Meters).

Feature Descriptions

In this chapter the data on the 14 features defined at the Copeland site will be presented. These were located over all three seasons of the excavations. Features 1-4 were defined in the 2007 season, Features 5-12 were defined in the 2008 season, and Features 13 and 14 were defined in 2009. The majority of these features are located in a line running northwest-southeast between Features 2 and 13. This line is located to the northeast of the main area of structures. Thus, most were exposed in Excavation Unit 2 near the structures. All the features are shown alone in Figure 30, and in association with the post molds in Figure 27 for Excavation Units 1-5. No features were located in Excavation Unit 6. The vast majority of the features were small pits filled with humus containing relatively small amounts of trash—primarily ceramics and tiny unidentifiable animal bone fragments. My best guess is that most of the features were originally excavated as sources for red clay used in wall daubing of the many structures located in the center of Excavation Unit 2, but this is, of course, uncertain. I now intuitively believe that the unexcavated area to the northeast of Excavation Unit 2 may contain many more similar features. A single feature located near the center of the structure area (Feature 5) was likely for a human burial. Additional comments will be made in the context of individual features below. Unfortunately not a single reconstructable ceramic vessel was discovered in any of the excavated features.

The method of excavation was similar for all features. After cleaning, drawing, and photographing the feature in plan view, the southern half of each feature was excavated, creating a profile through the feature from east to west. This profile was drawn, the unit was rephotographed, and then the northern half of the feature was excavated. After final cleanup, a third photo was made of the completed feature. Since all the features are quite similar, the photographs of the features are generally not very diagnostic. I am presenting photographs of only Features 7 and 12 as typical of all. Not all the features were excavated.

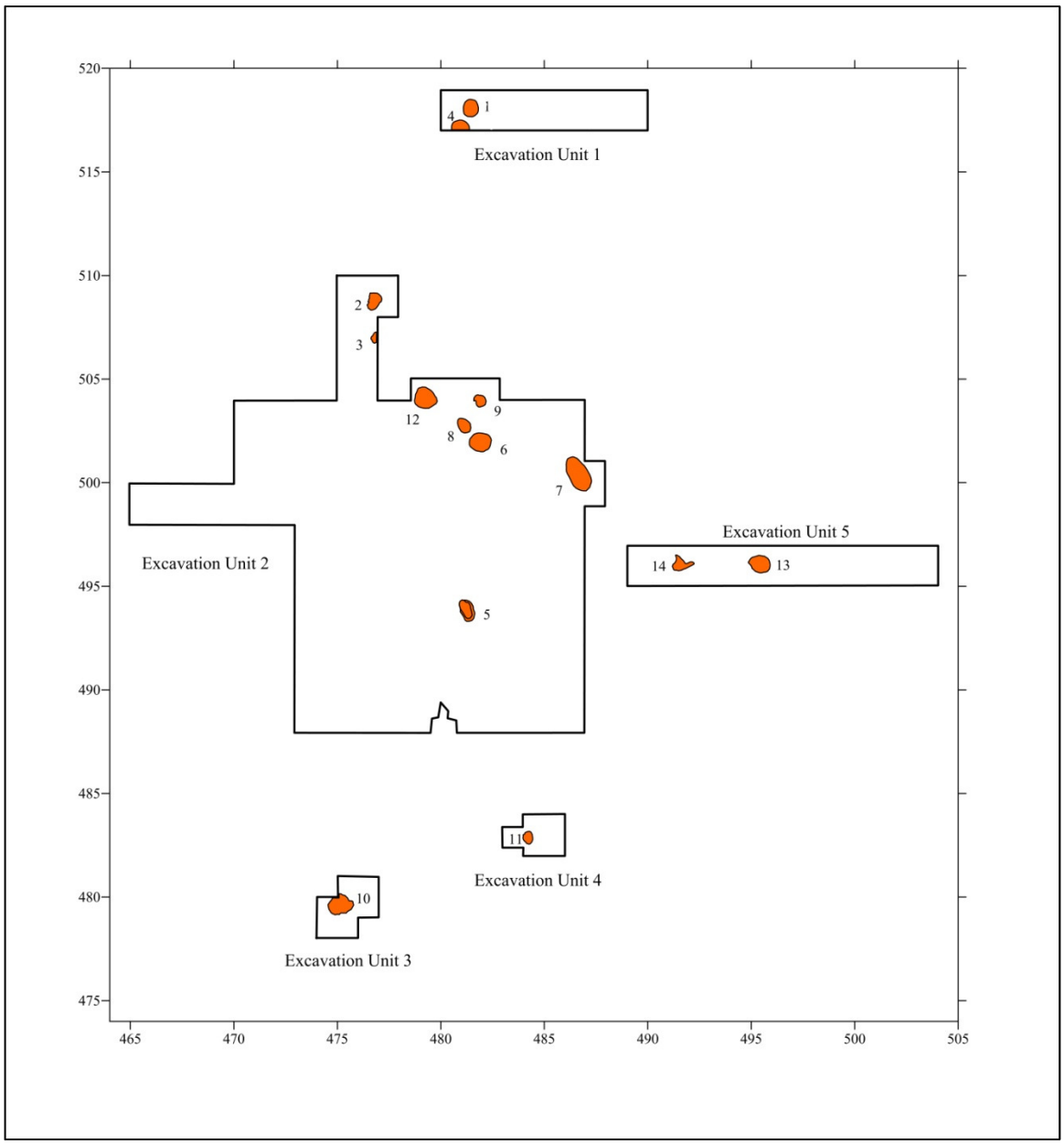

Figure 31. Excavation Units 1-5, All Features (Grid in Meters).

Feature 1

This feature was located in 2007 near the western end of the first excavation trench on the site. Originally labeled as Trench 1, this trench is now relabeled as Excavation Unit 1. It was excavated near the end of the 2007 season. While all the fill was screened through 1/4 inch mesh hardware cloth to recover artifacts, we also screened a fraction through window screen to check for small bones and seeds. None were found. In fact, preservation in all of the features was generally poor and faunal and floral preservation was virtually nil.

The plan view and profile of Feature 1 are shown in Figure 31 below. The feature was generally round, and slightly greater in diameter in the north-south direction. It was just under a meter in diameter. The pit had straight sides and a generally flat bottom. The depth of the features below the sterile red clay at the bottom of the plow zone was about 25 centimeters. The fill was a uniform dark brown loam. A few animal bone fragments were noted in the fill.

The ceramics from the features are shown in Table 4, while the few additional materials are shown in Table 5. As is true for all the features, it is somewhat difficult to determine its period of use. All are dated either to the Scull Shoal phase of the Savannah period (A.D. 1250-1375) or the Duvall phase of the Lamar period (A.D. 1375-1450) (Williams and Shapiro 1990). The transition between these two phases is estimated to have taken place about A.D. 1350-1375. The complicated stamped ceramics are similar between these two phases, and the key indicators are two in number. The first is the presence or absence of the type Morgan Incised, a thin line incised ware restricted to the Piedmont part of the Oconee River valley (Williams and Thompson 1999). The second indicator is the presence or absence of narrow folded rims, usually with small hollow cane punctates upon the fold. Both of these are indicators of the later Duvall phase. These characteristics will be noted for all the features. On the other hand, sherds of these types from the later occupation could have entered a given feature at a later date through the action of plant roots or ground burrowing animals.

There are no Morgan Incised sherds, nor any folded rim sherds in the fill of Feature 1. Thus it is a logical assumption that it can be placed temporally in the Scull Shoals phase. The total number of sherds located in the feature was 151, with plain and Unidentified Complicated Stamped being the two dominant types. The vast majority of the Unidentified Complicated Stamped in this feature, and in the others as well, is properly identified as Savannah Complicated Stamped. I have chosen to define it as unidentified, however, because it is almost impossible to distinguish this from Lamar Complicated Stamped of the following period. An alternate classification might be Savannah / Lamar Complicated Stamped. It is clear that they are both sequential parts of a continuum of complicated stamped grit tempered ceramics. The cob marked and burnished plain types found in Feature 1 are also considered minority types in the Savannah period. The total weight of the sherds from this feature was 1163 grams, or just over 2.5 pounds.

As noted in Table 5, there were a few red river pebbles present. These items have been located on many Mississippian sites in the Oconee River valley, and are associated with cooking activities (Williams 1995b). This implies that cooking was, not too surprisingly, a common activity in the vicinity of Feature 1. A few flakes were

recovered, but I believe these could have been produced at any period in the past on the site.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	Total Number	Total Grams
Plain Body	18	156.0	59	221.0	77	377.0
Burnished Plain Body	0	0.0	3	38.0	3	38.0
UID Eroded Body	1	9.0	0	0.0	1	9.0
UID Complicated Stamped Body	25	331.0	33	252.0	58	583.0
Cob Marked Body	2	9.0	1	5.0	3	14.0
Simple, Plain Rim	0	0.0	2	6.0	2	6.0
Simple, Complicated Stamped Rim	2	73.0	2	27.0	4	100.0
Rolled, Cob Marked Rim	0	0.0	1	18.0	1	18.0
Rolled, Burnished Plain Rim	0	0.0	1	11.0	1	11.0
Fired Coil Fragment	0	0.0	1	7.0	1	7.0
Ceramic Totals	48	578.0	103	585.0	151	1163.0

Table 4. Feature 1 Ceramics.

Type	Northern Half Number	Southern Half Number	Total Number
Quartz Flake	1	3	4
CP Chert Flake	0	1	1
Red River Pebble	3	5	8
Animal Bone Fragment	32	27	59
Daub	3	0	3

Table 5. Feature 1 Miscellaneous Artifacts.

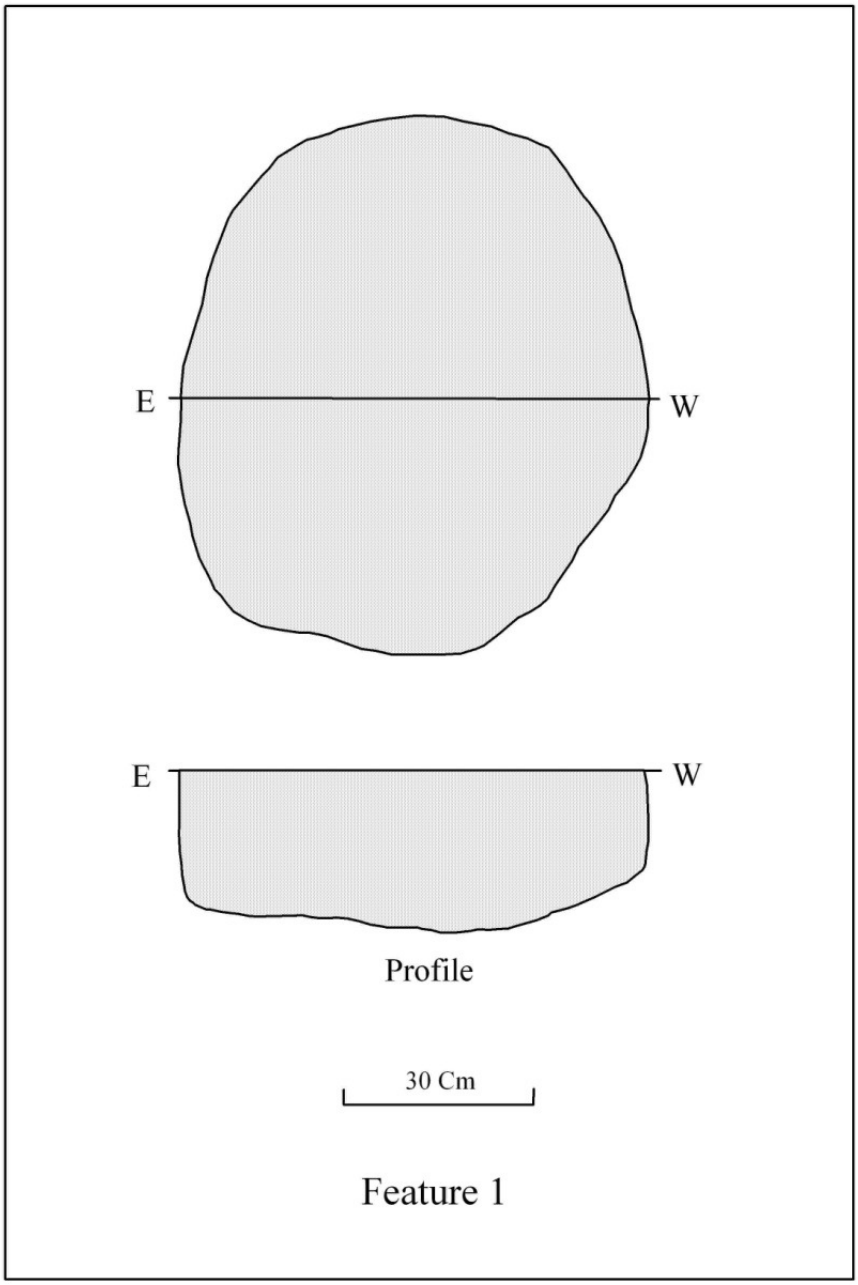

Figure 32.

Feature 2

This small feature was located at the northern end of Trench 5 from the 2007 season. Its location was actually partially outside of Trench 5 to the east, and it was clear that to excavate it, we would have to expand the trench a bit in that direction. We did not do that in 2007, but did expand the trench in 2008 (then designated as a part of Excavation Unit 2), and did excavate it in 2008.

The plan view and profile are presented here as Figure 32 below. This was very irregular shaped pit with a shallow basin shape. It was significantly smaller than Feature 1. The artifacts from the unit are presented in Tables 6 and 7 below. There were many fewer sherds than Feature 1, which makes it even more difficult to assign a time period. The lack of any Morgan Incised or folded rim sherds supports a general assignment to the Savannah period rather than the Lamar period. A few shell and unidentifiable animal bone fragments were present.

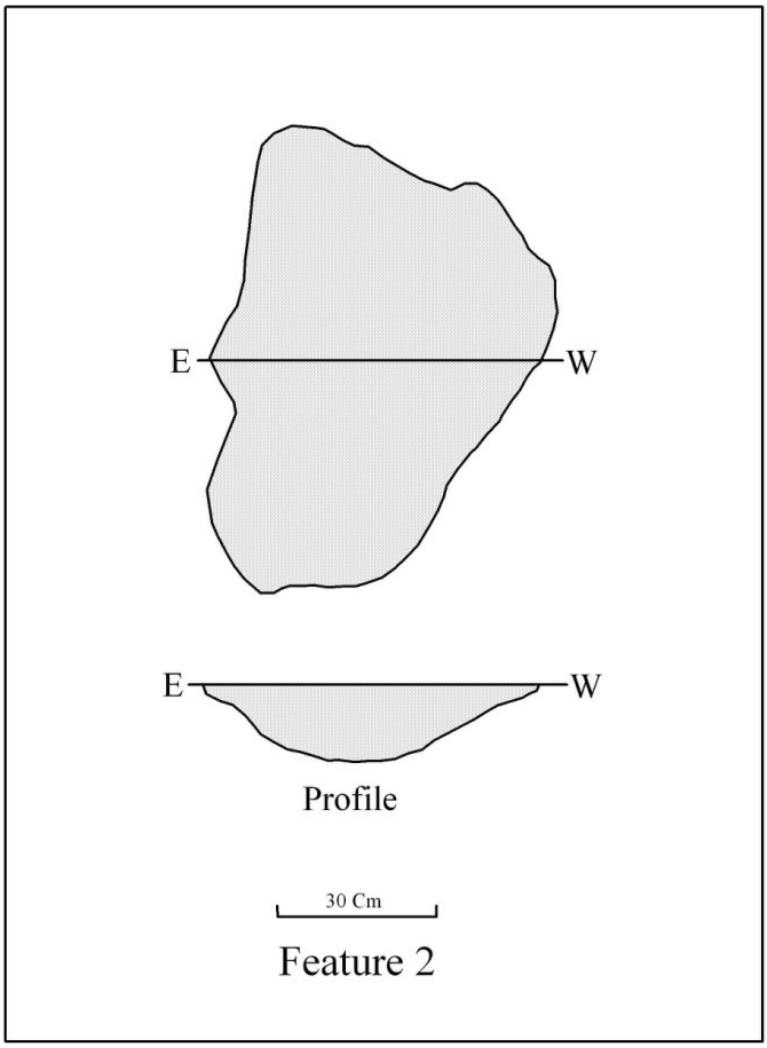

Figure 33.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	General Number	General Grams	Total Number	Total Grams
Plain Body	4	34.6	4	2.4	44	158.0	52	195.0
UID Complicated Stamped Body	0	0.0	5	64.4	8	24.5	13	88.9
Check Stamped Body	0	0.0	0	0.0	1	1.8	1	1.8
Ceramic Totals	4	34.6	9	66.8	53	184.3	66	285.7

Table 6. Feature 2 Ceramics.

Type	Northern Half Number	Southern Half Number	General Number	Total Number
Daub	28	3	13	31
White River Pebble	0	1	1	2
Red River Pebble	0	2	0	2
Shell Fragment	0	2	0	2
Animal Bone Fragment	0	1	0	1

Table 7. Feature 2 Miscellaneous Artifacts.

Feature 3

This small feature was located in 2007 just south of Feature 2 in the northern end of Trench 5 from that year. It was partially obscured in the profile to the east. Excavation of it was deemed impractical because it was centered under a large tree at the edge of the trench. We did not excavate Feature 3. Its plan view is shown here in Figure 33.

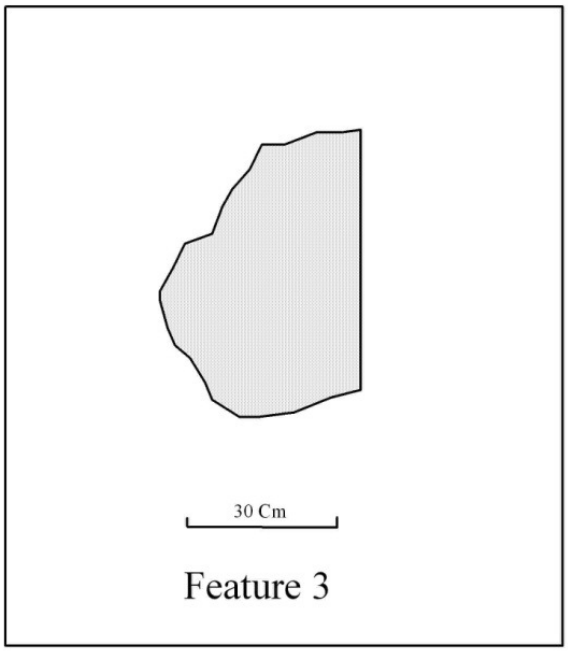

Figure 34.

Feature 4

This feature was located just south of Feature 1 in the profile of Trench 1 and was found in the 2007 season. Since it would have taken an expansion of Trench 1 to excavate the features, it was not excavated in 2007. By the 2008 season, our explorations had become centered on the major area of the structures that had been located in

Excavation Unit 2, and I decided to conduct no further work in the Trench 1 area. Thus Feature 4 was not exposed or excavated. The portion of it that was exposed in 2007 is presented here in Figure 34. It was round and just under a meter in diameter.

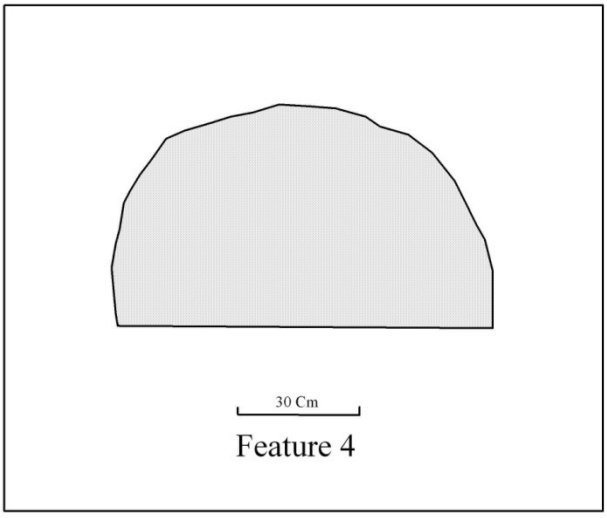

Figure 35.

Feature 5

This feature was located during the 2008 season near the center of the area of dense post molds at the center of Excavation Unit 2. The feature was different in form from all of the other features at the site as is made clear from the drawing of the feature in Figure 35 below. It was oval in shape and about 1.5 by 0.7 meters in size. Also, the center of the feature consisted of a brighter red clay than the surrounding area and the outer ring was of a medium brown fill. This feature appeared to me to be consistent with that of a tree tip, a pattern seen frequently in the Georgia Piedmont. With this in mind, and given its proximity to many post molds of interest, we did not attempt to excavate it in 2008 at the time we excavated most of the rest of the features.

During the 2009 season, we were excavating the post molds in the area of Feature 5 and exposed the crown of a small human skull, obviously that of an infant or very small child at the bottom of one post mold (Number 243). In another nearby post mold (Number 244) portions of a very small human femur were located at the same depth and about 40 centimeters away. It seems certain that these remains are of the burial of a human infant or child placed in Feature 5. The feature was intruded by several post molds.

Upon recognizing that a human burial had been discovered, excavation ceased at the site and the Forest Archaeologist was notified of this discovery per stipulations in the permit. He then notified potentially interested Tribes and subsequently initiated consultation with representatives of the Muscogee (Creek) Nation, Alabama-Quassarte Tribal Town, and Thlopthlocco Tribal Town on the treatment of this these remains. According to stipulations in the Native American Graves Protection and Repatriation Act (NAGPRA) all work had to cease at the site for 30 days unless agreement could be reached on how to proceed. Discussions between the Creek and Forest Service resulted

in the agreement that the burial would be covered up and left in place and that investigations could continue with the stipulation that no further features be excavated because the potential to disturb additional human. We have no idea if there were any associated artifacts. The feature is large enough for there to have been more than one infant in it, but this is, of course, unknown. Perhaps the most interesting thing about the discovery of the presence of this infant near the center of one of the special buildings at the site is that the identical pattern has been located at the Bullard Bottom site some 32kilometers away to the southwest in the Little River valley and 200 years later in time (Williams 2002). More discussion on this will be presented later in this report. There were no artifacts recorded from the post molds that intruded the feature.

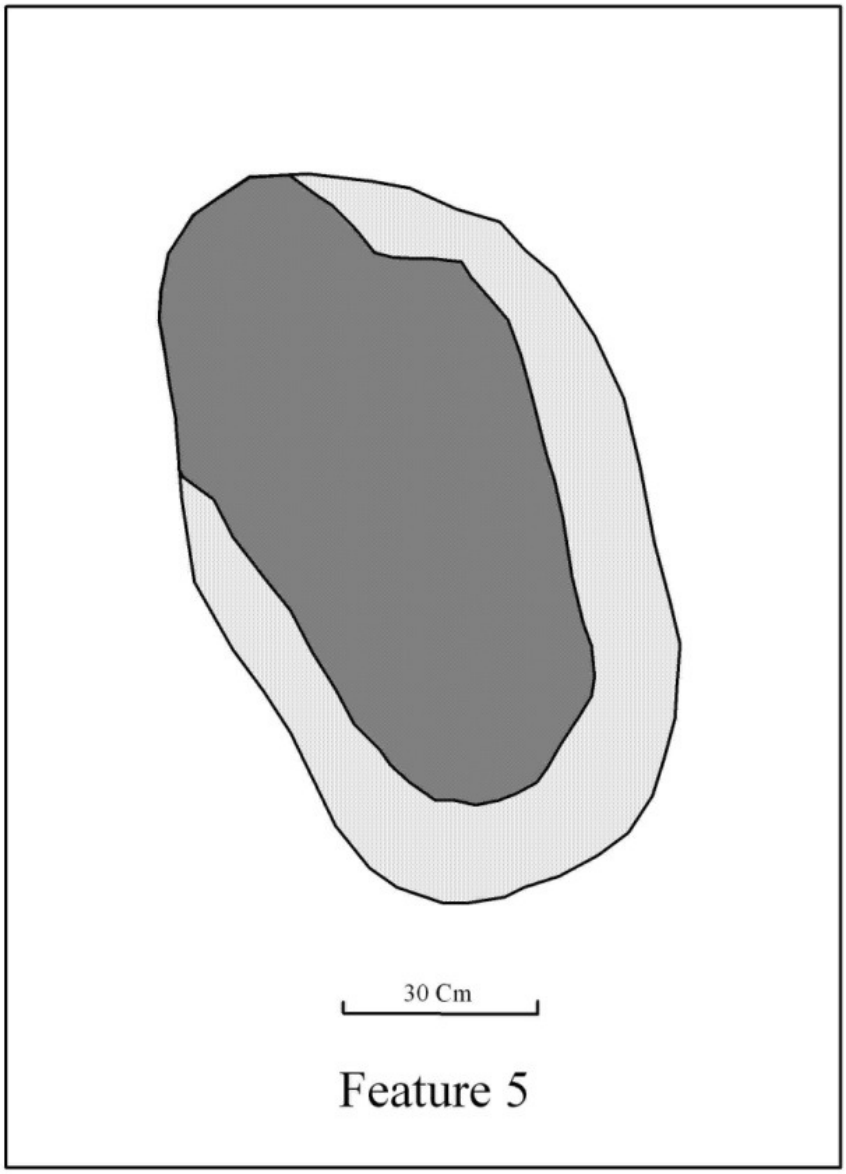

Figure 36.

Feature 6

Feature 6 was located northeast of the major concentration of posts in Excavation Unit 2. It was located during the 2008 season. It was actually located initially just inside the unit, but we expanded the unit to the north in that area to expose it completely. Upon that expansion, Feature 8 and parts of Features 9 and 12 were also exposed. We then expanded Excavation Unit 2 a bit more to expose Features 9 and 12 completely.

Feature 6 is shown in plan and profile in Figure 36 below. It was generally round, and about a meter in diameter. The profile revealed it to be a very shallow basin, only about 10 centimeters deep. The fill consisted of dark brown humus. The artifacts are shown in Tables 8 and 9. Despite its small volume, it did contain 153 sherds. Several of the complicated stamped ones were of specific motifs commonly associated with Savannah Complicated Stamped (Williams and Thompson 1999). On the other hand, a single Morgan Incised sherd was located. This is typically associated with the early Lamar period. Red (and white) river pebbles, shell fragments, and small amounts of unidentifiable animal bone fragments were fund in the fill.

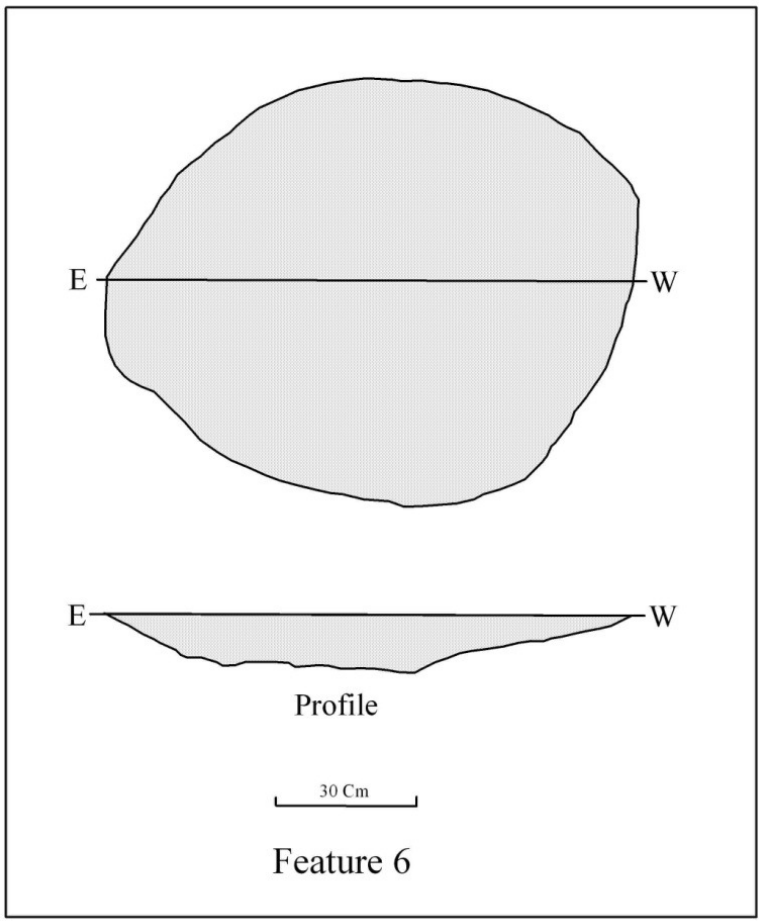

Figure 37.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	General Feature Number	General Feature Grams	Total Number	Total Grams
Plain Body	9	50.5	4	8.0	32	168.1	45	226.6
Burnished Plain Body	0	0.0	0	0.0	1	5.6	1	5.6
UID Complicated Stamped Body	4	26.7	10	32.2	71	564.6	85	623.5
Two Bar Rounded Diamond Stamped Body	2	70.4	0	0.0	2	39.5	4	109.9
Three Bar Rounded Diamond Stamped Body	0	0.0	0	0.0	1	17.3	1	17.3
Morgan Incised Body	0	0.0	0	0.0	1	9.3	1	9.3
Simple, Plain Rim	3	5.1	1	0.9	5	22.2	9	28.2
Rolled, Complicated Stamped Rim	2	6.8	0	0.0	4	24.9	6	31.7
Pipe Fragment	0	0.0	1	2.1	0	0.0	1	2.1
Ceramic Totals	20	159.5	16	43.2	117	851.5	153	1054.2

Table 8. Feature 6 Ceramics.

Type	Northern Half Number	Southern Half Number	General Feature Number	Total Number
Quartz Flake	4	3	1	8
Quartz Flake Tool	0	0	1	1
Metadacite Flake	1	0	0	1
Red River Pebble	5	0	0	3
White River Pebble	3	8	2	10
Shell Fragment	1	0	0	1
Animal Bone Fragment	8	0	0	8

Table 9. Feature 6 Miscellaneous Artifacts.

Feature 7

This feature was a large oval pit located southeast of Feature 6 in the northeastern section of Excavation Unit 2. It was located and excavated in 2008. As can be seen from its location on Figure 30, we expanded the block slightly to permit complete excavation of the feature. The plan view and the profile of the feature are shown in Figure 37 below. It was almost 2 meters long and about a meter wide. Feature 7 was the largest feature located or excavated at the Copeland site. Its profile shows sloping sides, and a general basin shape. The fill was of a rich dark black midden soil. Since this was the largest and one of the most productive features excavated I am including three photographs of it before, during, and after excavating. These are Plates 16-18 below.

The artifacts from Feature 7 are presented in Tables 10 and 11. There were 591 sherds in the features weighing 3371 grams (almost 7.5 pounds). Surprisingly there were no reconstructable vessel fragments in this large amount of pottery. There was one large fragment of a small bowl with a simple incised design (Plate 19). This design does not suggest any specific known ceramic type. Almost all of the (relatively few) key phase markers indicate a probable Savannah period occupation for this feature. There was a single folded rim sherd, but no Morgan Incised sherds. Either the folded rim sherd was

intrusive or this feature dates from the transition period between the phases. A single battered celt fragment was located in the fill of the feature.

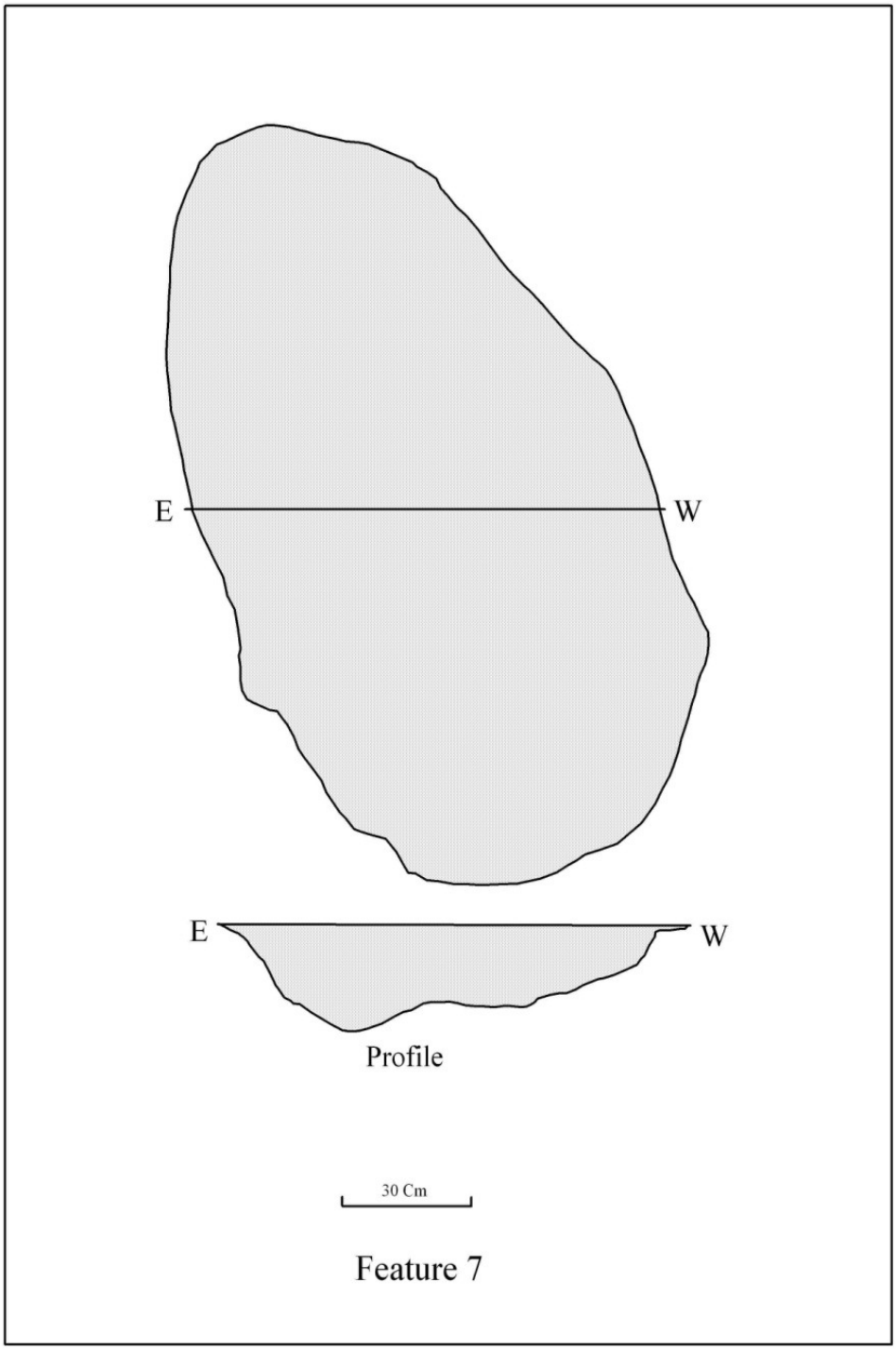

Figure 38.

Plate 16. Feature 7 before excavation.

Plate 17. Feature 7 during excavation.

Plate 18. Feature 7 after excavation.

Plate 19. Unusual Incised Bowl Sherd from Feature 7.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	General Feature Number	General Feature Grams	Total Number	Total Grams
Plain Body	42	211.0	66	265.0	99	488.0	207	964.0
Burnished Plain Body	1	2.6	4	68.2	0	0.0	5	70.8
UID Complicated Stamped Body	84	685.0	72	531.5	177	396.0	333	1612.5
Red Filmed Body	4	51.7	0	0.0	0	0.0	4	51.7
Check Stamped Body	0	0.0	3	43.0	3	53.0	6	96.0
One Bar Cross Rounded Diamond Body	1	3.0	0	0.0	0	0.0	1	3.0
Two Bar Rounded Diamond Body	1	22.0	0	0.0	0	0.0	1	22.0
Two Bar Cross Rounded Diamond Body	4	49.0	3	79.7	3	54.0	10	182.7
Three Bar Rounded Diamond Body	1	37.3	0	0.0	2	54.0	3	91.3
Simple, Plain Rim	6	36.8	1	5.0	6	65.0	13	106.8
Simple, Complicated Stamped Rim	0	0.0	0	0.0	1	16.0	1	16.0
Simple, Incised Rim	0	0.0	1	106.0	0	0.0	1	106.0
Folded, Plain Rim	0	0.0	0	0.0	1	6.4	1	6.4
Rolled, Plain Rim	3	25.5	2	16.0	0	0.0	5	41.5
Ceramic Totals	147	1123.9	152	1114.4	292	1132.4	591	3370.7

Table 10. Feature 7 Ceramics.

Type	Northern Half Number	Southern Half Number	Total Number
Quartz Flake	2	14	16
White River Pebble	2	0	2
Red River Pebble	0	3	3
Charred Cane Fragment	3	0	3
Green Stone Celt Fragment	1	0	1
Shell Fragment	2	0	2
Animal Bone Fragment	4	8	12

Table 11. Feature 7 Miscellaneous Artifacts.

Feature 8

This shallow feature was located in Excavation Unit 2 just northwest of Feature 6. It was located and excavated during the 2008 season. Its plan and profile are presented in Figure 38 below. It was about 70 centimeter across, but only about 10 centimeters deep. The fill was of a medium brown color. The very few artifacts are presented in Tables 12 and 13. The number of sherds was only 4, the fewest of any of the features. There are no obvious Lamar sherds here, so it may be of a Savannah period creation. It clearly is associated with all the surrounding features as shown in Figure 30. A single animal bone fragment and 2 shell fragments were present.

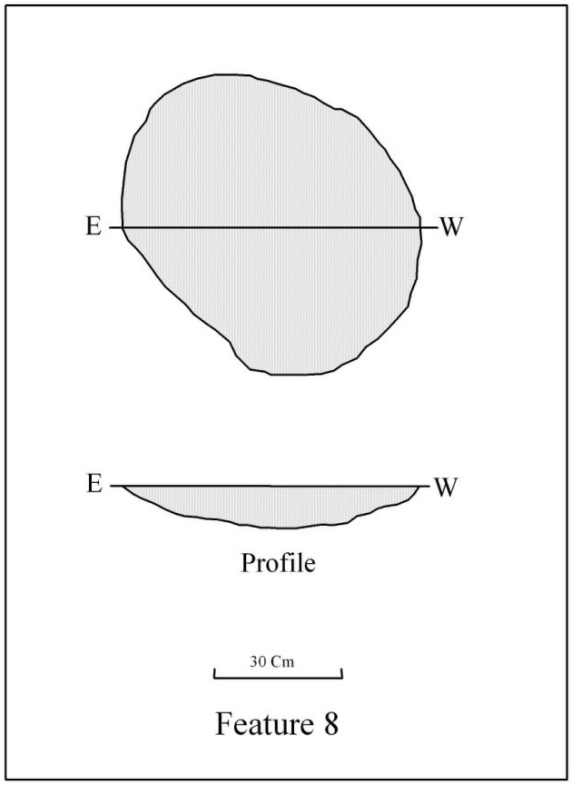

Figure 39.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	Total Number	Total Grams
UID Complicated Stamped Body	0	0.0	2	39.0	2	39.0
Simple, Plain Rim	0	0.0	2	4.0	2	4.0
Ceramic Totals	0	0.0	4	43.0	4	43.0

Table 12. Feature 8 Ceramics.

Type	Northern Half Number	Southern Half Number	Total Number
Crystal Quartz Flake	0	1	1
Quartz Flake	0	5	4
Animal Bone Fragment	0	1	1
Daub	0	20	20
Shell Fragment	0	2	2

Table 13. Feature 8 Miscellaneous Artifacts.

Feature 9

This small feature was located just northeast of Feature 8 and north of Feature 6 (see Figure 30). It was deeper than most of the other features discussed thus far. While it was only about 40 centimeters in diameter, it was almost that deep. The plan and profile are presented in Figure 39. The fill was of a brown midden.

The few artifacts from the features are presented in Tables 14 and 15. There were no obvious Lamar period artifacts in the feature so it presumably dates to the Savannah period.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	General Feature Number	General Feature Grams	Total Number	Total Grams
Plain Body	3	16.2	0	0.0	10	34.9	13	51.1
Burnished Plain Body	0	0.0	0	0.0	1	5.9	1	5.9
UID Complicated Stamped Body	4	49.2	0	0.0	16	145.5	20	194.7
Two Bar Rounded Diamond Body	1	15.2	0	0.0	0	0.0	1	15.2
Simple, Complicated Stamped Rim	0	0.0	0	0.0	1	4.7	1	4.7
Plain Bottom Pat	1	98.7	0	0.0	0	0.0	1	98.7
Ceramic Totals	9	179.3	0	0.0	28	191	37	370.3

Table 14. Feature 9 Ceramics.

Type	Northern Half Number	Southern Half Number	General Feature Number	Total Number
Quartz Core?	0	0	3	3
Red River Pebble	0	0	2	2
Diabase Cobble	0	0	1	1
Daub	3	0	5	8

Table 15. Feature 9 Miscellaneous Artifacts.

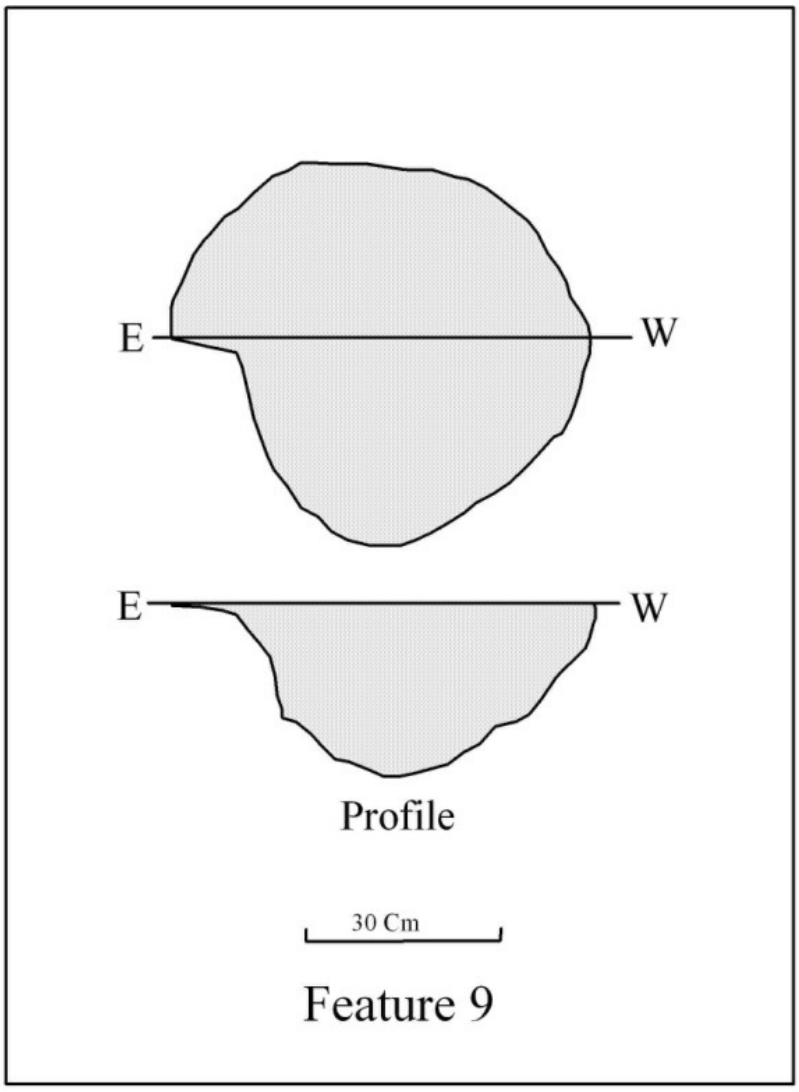

Figure 40.

Feature 10

This feature was located in the center of Excavation Unit 3 (see Figure 30). This unit was excavated here in 2008 because of a relatively large amount of ceramics located in a shovel test placed here. I believed that the large quantity might be due to a feature here, and we did locate Feature 10 in the unit. The southwest square was the first one excavated, and, once we saw the portion of Feature 10 located in it we expanded the unit to the northeast to encompass the full extent of the feature. The plan and profile of the features are presented in Figure 40 below. It was irregular in shape and just over a meter in diameter. The maximum depth was about 40 centimeters. In the field we believed that it might be a tree, but I now believe it was a pit that does date to the period of occupation of the site.

The artifacts are presented in Tables 16 and 17 below. The number of sherds was only 89, far fewer than we were anticipating based upon the shovel testing. In this sense, the feature was a disappointment. Interestingly, there were three Morgan Incised sherds and one Folded Cane Punctated rim, all associated with the early Lamar period. Perhaps this feature dates to a slightly later occupation of the site. Given its proximity to the structures, however, it perhaps means that the use of the structures continued on into the early Lamar period from the Savannah period.

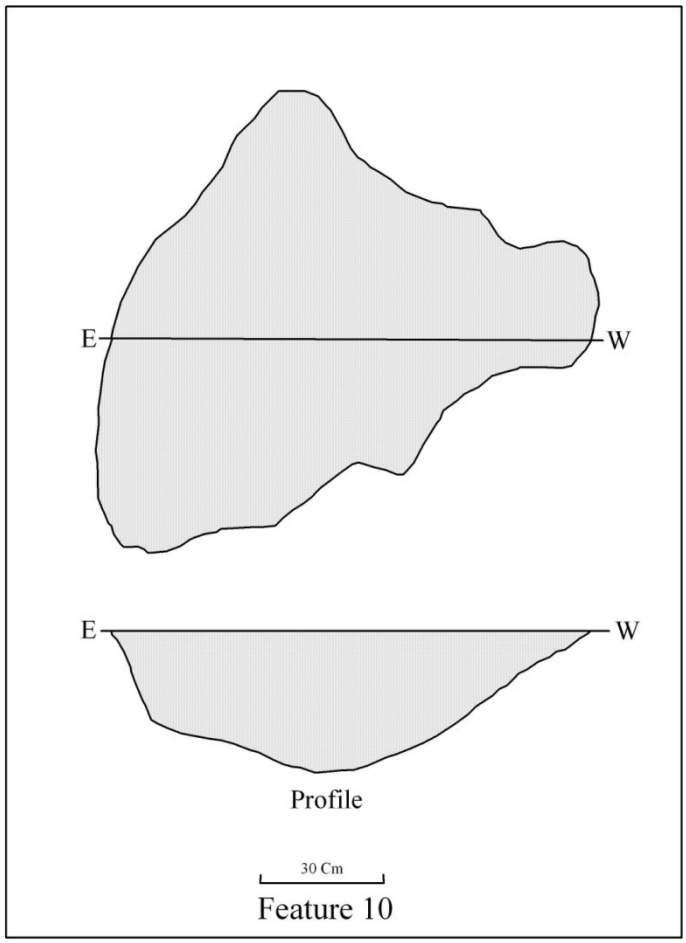

Figure 41.

Type	General Feature Number	General Feature Grams	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	Total Number	Total Grams
Plain Body	8	34.0	18	69.5	11	28.3	37	131.8
Simple Stamped Body	0	0.0	1	9.5	0	0.0	1	9.5
UID Complicated Stamped Body	15	45.1	20	85.3	0	0.0	35	130.4
Morgan Incised Body	1	4.2	2	5.5	0	0.0	3	9.7
Punctated and Stamped Body	1	1.7	0	0.0	0	0.0	1	1.7
Simple, Plain Rim	4	11.2	2	20.1	2	20.5	8	51.8
Check Stamped Body	0	0.0	1	13.4	0	0.0	1	13.4
Folded and Cane Punctated Rim	1	4.0	0	0.0	0	0.0	1	4.0
Rolled, Plain Rim	1	2.7	0	0.0	0	0.0	1	2.7
Pottery Disk	1	9.0	0	0.0	0	0.0	1	9.0
Ceramic Totals	32	111.9	44	203.3	13	48.8	89	364.0

Table 16. Feature 10 Ceramics.

Type	General Feature Number	Northern Half Number	Southern Half Number	Total Number
Quartz Core?	2	1	0	3
White River Pebble	0	0	0	0
Red River Pebble	1	1	0	2
Stone Discoidal	1	0	0	1
Metadacite Flake	1	0	0	1
Deer Astragulus	1	0	0	1
Animal Bone Fragment	2	0	0	2

Table 17. Feature 10 Miscellaneous Artifacts.

Feature 11

This feature was located in Excavation Unit 4 northeast of Excavation Unit 3 and south of Excavation Unit 2. In a similar manner to Excavation Unit 3, XU4 was placed here based upon a high positive shovel test. The only feature noted in the unit was the small Feature 11. It was in the western edge of the initial 2 meter square placed in this location so we expanded the unit slightly to the west to encompass the full extent of the feature.

Feature 11 was only about 40 centimeters in diameter, was slightly oval in shape, and was just over 30 centimeters deep. Its fill was a dark brown midden. The plan and profile are illustrated in Figure 41 below. The artifacts are presented in Tables 18 and 19. No artifacts of the Lamar period were noted. A single deer bone and a few other unidentifiable animal bones as well as cooking pebbles were located in the fill.

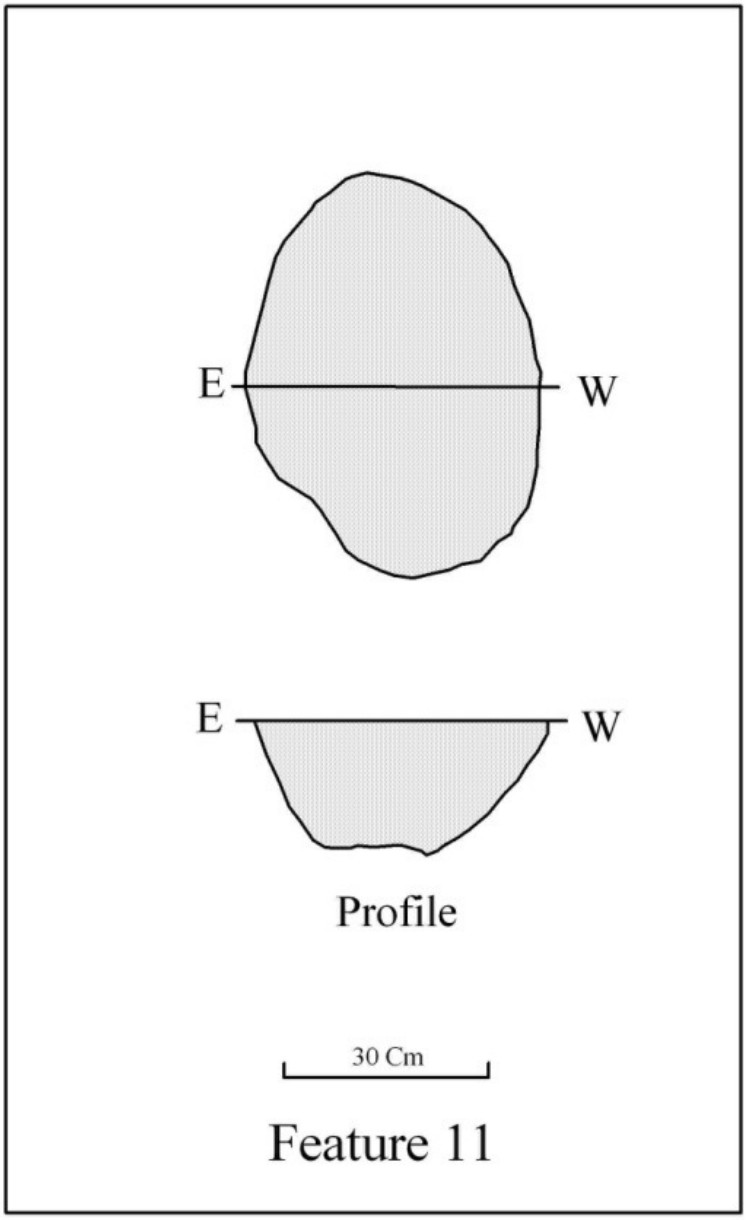

Figure 42.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	General Number	General Grams	Total Number	Total Grams
Plain Body	7	20.0	3	4.0	1	11.0	11	35.0
UID Complicated Stamped Body	4	42.9	2	8.9	6	27.1	12	78.9
Simple, Plain Rim	1	2.9	0	0.0	1	10.6	2	13.5
Ceramic Totals	12	65.8	5	12.9	8	48.7	25	127.4

Table 18. Feature 11 Artifacts.

Type	Northern Half Number	Southern Half Number	General Number	Total Number
Quartz Flake	6	0	2	8
Diabase Primary Flake	0	0	1	1
White River Pebble	3	9	1	13
Red River Pebble	0	2	0	2
Animal Bone Fragment	8	4	0	12
Daub	20	22	0	42

Table 19. Feature 11 Miscellaneous Artifacts.

Feature 12

This was located in Excavation Unit 2 northwest of Feature 8 and west of Feature 9. It was almost perfectly circular and about a meter in diameter. The plan and profile are presented here in Figure 42. The basin shaped pit was about 30 centimeters deep. As can be seen from the drawing, the deepest part was slightly east of the center of the feature. I have included photographs of this feature in Plates 20-22. The fill was a dark brown midden. A recent animal burrow is visible in the northeastern part of the feature. The artifacts from Feature 12 are presented in Tables 20 and 21. There were no Lamar period artifacts in the collection, thus the best assignment by time period is to the Savannah period. There were small amounts of unidentifiable animal bone, cooking pebbles, and a tiny clay pipe fragment included in the fill of the feature, which was excavated in 2008.

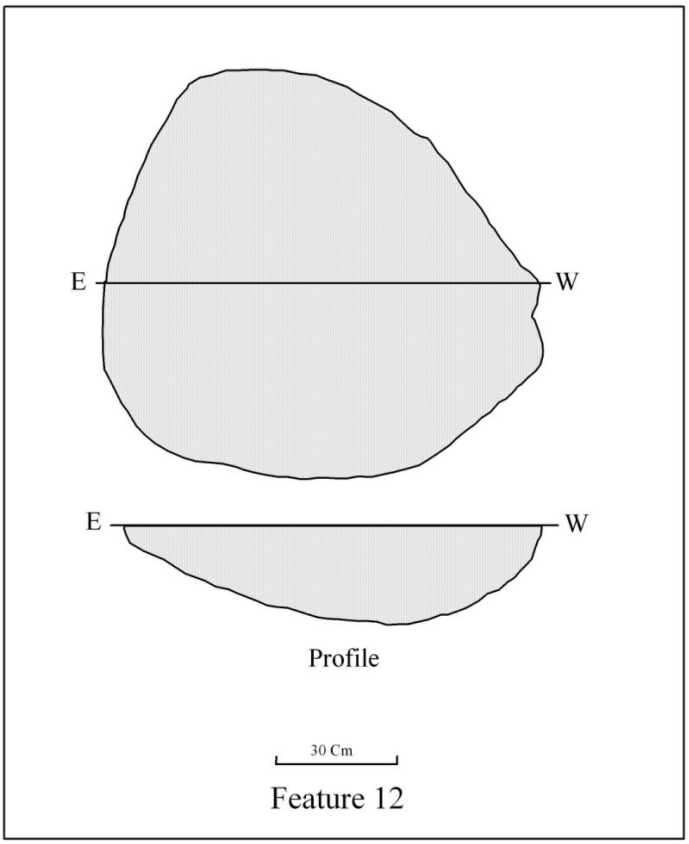

Figure 43.

Plate 20. Feature 12 before excavation.

Plate 21. Feature 12 during excavation.

Plate 22. Feature 12 after excavation.

Type	Northern Half Number	Northern Half Grams	Southern Half Number	Southern Half Grams	General Feature Number	General Feature Grams	Total Number	Total Grams
Plain Body	15	63.4	0	0.0	0	0.0	15	63.4
Burnished Plain Body	1	13.0	0	0.0	1	11.5	2	24.5
UID Complicated Stamped Body	17	187.0	21	0.0	10	32.8	48	219.8
Cord Marked Body	0	0.0	2	20.9	0	0.0	2	20.9
Simple Stamped Body	0	0.0	1	8.3	0	0.0	1	8.3
One Bar Cross Rounded Diamond Body	0	0.0	1	60.2	0	0.0	1	60.2
Two Bar Cross Rounded Diamond Body	0	0.0	1	17.6	0	0.0	1	17.6
Three Bar Cross Rounded Diamond Body	0	0.0	1	17.9	0	0.0	1	17.9
Simple, Plain Rim	4	14.6	2	10.8	0	0.0	6	25.4
Simple, Complicated Stamped Rim	1	24.3	0	0.0	0	0.0	1	24.3
Rolled, Plain Rim	1	1.4	1	3.6	0	0.0	2	5.0
Rolled, Complicated Stamped Rim	0	0.0	1	6.4	0	0.0	1	6.4
Pipe Fragment	0	0.0	1	1.0	0	0.0	1	1.0
Ceramic Totals	39	303.7	32	146.7	11	44.3	82	494.7

Table 20. Feature 12 Ceramics.

Type	Northern Half Number	Southern Half Number	General Feature Number	Total Number
Quartz Flake	0	1	0	1
Crystal Quartz flake	1	0	0	1
Quartz Biface	0	1	0	1
Heat Treated CP Chert Flake	0	0	2	2
RV Chert Flake	0	0	3	3
White River Pebble	0	4	1	5
Red River Pebble	2	3	0	5
Animal Bone Fragment	20	18	0	38
Daub	15	15	0	30

Table 21. Feature 12 Miscellaneous Artifacts.

Feature 13

Feature 13 was located in the center of Excavation Unit 5 during the 2009 season. It was a round feature of medium size, a bit over 1 meter in diameter. It was visible in the sterile red clay of the bottom of the excavation unit as a dark brown stain. Its plan view is shown here in Figure 43 below. This feature is in a location that continues a line of features in the north-northeastern part of Excavation Unit 2. It is very likely that Feature 13 is a pit of similar fill to those such as Feature 12 in that area. Feature 13 was not excavated at the request of the Forest Archaeologist of the Oconee National Forest. It was recorded after the discovery of the burial associated with Feature 5. Following consultation between the Forest Service and the Creek (see discussion associated with Feature 5), it was agreed that investigations at the site would continue with the stipulation that no further excavation of features would occur in order to not disturb any additional burials that were now believed to potentially be present.

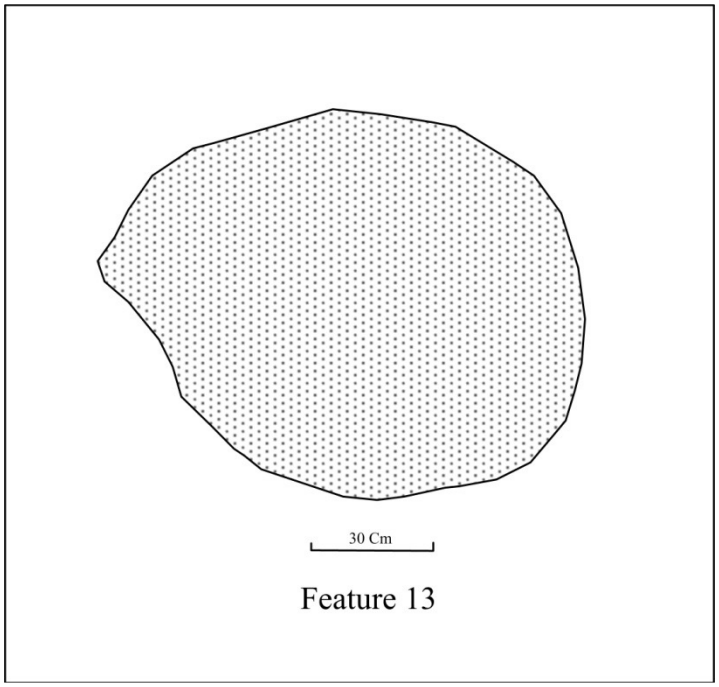

Figure 44.

Feature 14

This feature is a very irregular shaped dark stain located in 2009 at the western end of Excavation Unit 5. This places it to the east of the main structures located at the site (see Figures 27 and 29). Its shape is certainly reminiscent of a tree root pattern. It is about a meter in diameter east-west, and something less than that on its north-south axis. This feature was not excavated at the request of the Forest Archaeologist of the Oconee National Forest. Feature 14 was recorded following the discovery of the burial associated with Feature 5. Following consultation between the Forest Service and the Creek (see discussion associated with Feature 5), it was agreed that investigations at the site would continue with the stipulation that no further excavation of features would occur in order to not disturb any additional burials that were now believed to potentially be present. It is shown here in Figure 44 below. Although its shape suggests that it may not be a cultural feature, its location is in line with others located northeast of the area of the structures at Copeland, and thus I am not certain that it is merely a tree stain.

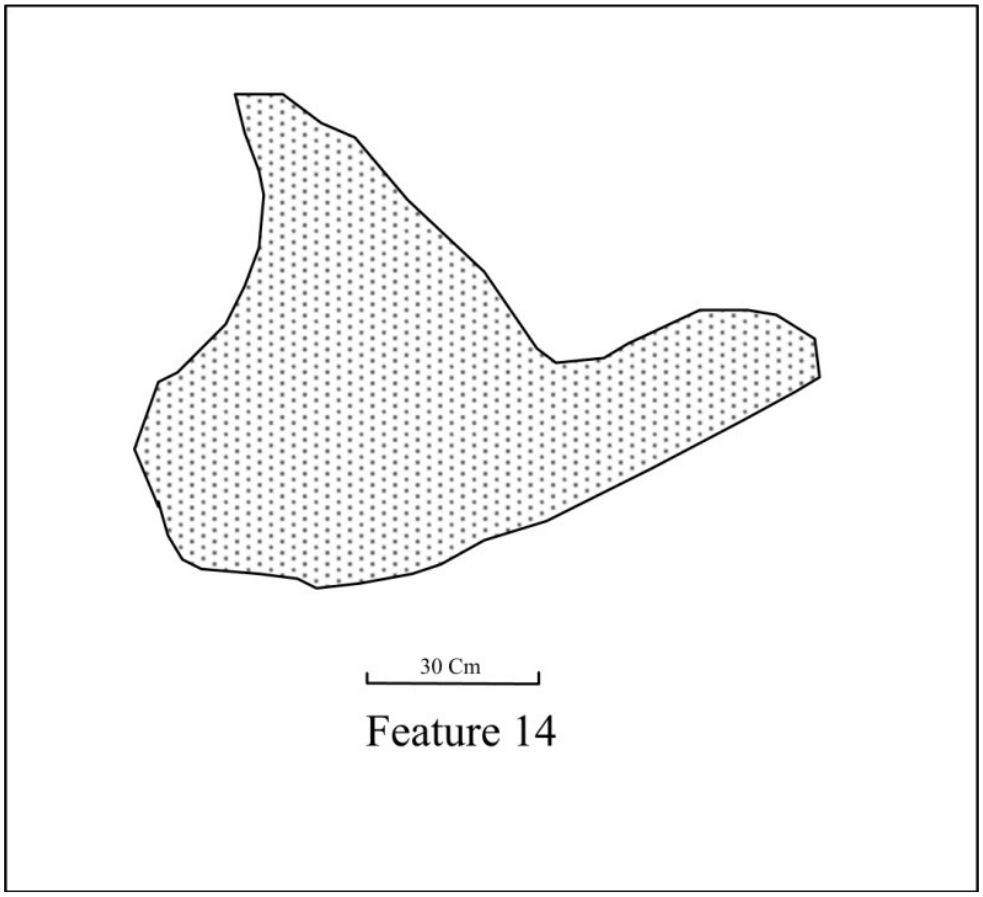

Figure 45.

Post Mold Data Overview

It is obvious from Figure 28 that a huge number of post molds were identified in the 2007-2009 excavations at Copeland. Indeed, it was the hope that this would be the case that led to the excavations in the first place. The main area of the post molds was Excavation Unit 2 and the comments here refer mainly to these. All post molds were numbered as they were located. Each post mold was flagged with a nail and flagging with the post hole number and its diameter written on the flag. I made all determinations of which stains were given numbers. The diameters of the stains were recorded and their exact grid locations were made at the same time using a total station. The depth of each post mold was estimated during 2007 and 2008 using a 1 inch Oakfield corer.

The data from the total station was easily downloaded into a computer and the program Surfer was used to create maps from the post locations. The diameters of the posts in the maps were directly related to the diameters recorded in the data file. In Surfer layers were made of each and every post mold diameter in centimeters. Then I began the most complicated part of the process. Using intuition and luck, different diameter post layers were turned on and off while attempting to recognize rectilinear or curvilinear patterns in the displayed data. As patterns became more apparent, a new approach was implemented. The post numbers that were believed to be associated with a given structure were extracted into a separate Excel database table and a layer was created from them. Further, a new layer with these posts removed was created. By removing the posts associated with a probable structure from the total post dataset, it was easier to see other possible structures. Once a second possible structure was recognized, a similar process was followed. This overall process was repeated until about a dozen possible structures were identified.

All of these were then completely reassessed and posts frequently were moved from one structure to another. I am not concerned that the posts from each possible structure were not all of the same diameter—this is common. Indeed, we were looking at posy hole diameters, not actual post diameters anyway. A separate layer of unused post molds was maintained as a reservoir. Posts were used from or added back to the reservoir layer frequently as the process continued. I had the help of several students in looking over the data. Several of the early defined structures were rejected as improbable, and the process at several points seemed almost impossible. While I am generally happy with the result, and it likely could not have been accomplished without Surfer, there was no magic here, and the specifics of the structures revealed could and should be examined further in the future. Without these tools past archaeologists would simply have had to resort to saying that “many structures were apparently located in this area”. I attempted to use the post mold depth data as an auxiliary data set to help define the structures, but it was of minimal use.

In 2009 we excavated and screened the fill of all the post molds in Excavation Unit 2 to recover artifacts that would hopefully allow us to place the structures into a chronological sequence. The process was not entirely successful. I will comment further after presenting the nine structures that eventually were accepted from the post mold data. The unused posts are shown in Figure 58 after all the other structures are presented. Finally, although of limited value, Figure 59 shows all the defined structures and features together.

Structures 1-9

Structure 1

This is the first structure identified at Copeland, and it is round. The diameter is 9.0 meters (29.5 feet). It is shown here in Figure 45. This makes its smaller than the council houses at other known sites in the Oconee River valley. We initially defined a set of posts that likely represented the initial construction of the structure during the middle of 2008. This is show in Plate 12 during its initial clearing and in Plate 23 below. These early stage reconstructions show posts at a very even spacing around the perimeter, with three closely spaced center posts. As analysis of the maps continued during 2009, it became clear that there were many other smaller posts that had been added during the life of the structure as part of maintenance operations on the round building. It also became clear, as shown in Figure 45, that there were three other posts (all three as double posts) between the three center posts and the outer wall of Structure 1. It is unclear where the entrance to Structure 1 was located. There is a 1 meter wide gap on the northern side and this may be it.

Structure 2

This was a second round structure, located inside Structure 1. It is presented in Figure 46. Its diameter was 6.5 meters (21.3 feet), and it was generally, but not perfectly concentric with Structure 1. It is certainly still possible that it was actually a part of Structure 1. It may have been rebuilt on occasion, just as may have been the case for Structure 1. My initial idea for this ring was that it might represent a set of benches located inside Structure 1. Both Structure 1 and 2 are shown together in Figure 54 and Plate 24. This is certainly still possible, but I eventually came down on the side of believing that it was a second structure of a slightly earlier or later period. The three closely spaced center posts for Structure 1 are not at the center of Structure 2. The three outer double center pots defined for Structure 1, however, may actually be associated with Structure 2. There is no obvious entranceway to Structure 2 except for a 1 meter wide gap on the northern side. Post Mold 89 in the magnetic western part of the structure and contained a few unidentified bone fragments.

Structure 3

This does not appear to be a “normal” structure (whatever that is!) and may actually be a screen wall or light palisade surrounding most of the center of Excavation Unit 2. My reason for equivocating here is the troublingly large size and odd shape of the proposed structure. Structure 3 is presented in Figure 47. It is large; measuring 14.0 meters (45.9 feet) by 13.0 meters (42.6 feet) in size. The shape is rectangular, but apparently with rounded corners. The long axis is to the northeast, and is oriented about 30 degrees north of east. I do not see any obvious interior posts to associate clearly with this structure. It is not concentric with Structures 1 and 2, but is somewhat off center to the north of these two. It is not larger than some known council houses—indeed it is about the same size at the ones from the Joe Bell site (9Mg28) and the Bullard Bottom site (9Pm169), both in the Oconee River valley from later time periods (Williams 1983, 2005). Both of these were round, however. Post Mold 48 in the magnetic southern portion of this structure revealed a few unidentified bone fragments.

Structure 4

This rectangular structure is unusual in that it completely surrounds Structure 5. It is located in the center of Excavation Unit 2 and measured 4.5 meters (14.8 feet) by 3.8 (12.5 feet) in size. It is presented here in Figure 48. It is also a bit strange since three of the corners (all but the southwestern) appear to be open. That is, the corner posts seem to be simply missing. Another way to state this is that the corners appear to be the locations of entranceways. This small structure is oriented with its long axis 23 degrees south of east.

Structure 5

Structure 5 was the smallest defined at the Copeland site, and was in the very center of Excavation Unit 2. It was a rectangular structure that measured 3.8 meters (12.5 feet) by 3.0 meters (9.8 feet). Structure 5 is shown in Figure 49. The long axis was toward the east, and the angle of the tiny building was 23 degrees south of east. There is a slight possibility that this actually is part of the interior of one of the round structures, but I personally believe it is distinct, given how many posts are defined for its walls. Indeed, one of the odd things about this structure, in addition to its small size, is that is seems to have been a well built structure made with reasonably large posts. There were no obvious interior posts for Structure 5, but there were so many posts in this area of Excavation Unit 2 that it was truly difficult to tell.

Structure 6

This structure is very different from all the other eight structures defined within Excavation Unit 2. It was located in the southeastern part of the unit, and was thus the closest to the huge gully at the site. This structure is presented in Figure 50. Structure 6 is square with rounded corners. The size is 5.5 meters (18.0 feet) on a side. The angle of the structure to the grid is just a few degrees west of north. This is unlike any of the other structures defined in Excavation Unit 2, and implies that it is earlier or later than the other structures. There appears to be some sort of interior screen wall in the southwestern part of the structure. On the other hand, no obvious center support posts were noted. The complex relationship of Structures 3, 4, and 5 is presented in Figure 55.

Structure 7

This was a rectangular structure located near the west center of Excavation Unit 2. It was almost square and measured 5.0 meters (16.4 feet) by 4.0 meters (13.1 feet) in size. Structure 7 is shown here in Figure 51. The southeastern wall of the structure oddly did not form a right angle with the other three walls. The longer axis was in the northeast-southwest direction. The structure was oriented at 23 degrees south of an east-west direction. There were no interior posts noted in the structure, although this is difficult to judge with all the other posts in the Excavation Unit.

Structure 8

This is the probably the least convincing of the structures presented here. It is a rectangular structure that is 7.0 meters (23.0 feet) by 3.0 meters (9.8 feet) in size. The orientation is 23 degrees south of east as can be seen in Figure 52. There are no clear interior posts in the structure as defined. It appears that there might have been some

maintenance work on the structure during its life. This structure was on the southern side of Excavation Unit 2. This structure appears to be a pair with Structure 9.

Structure 9

This is a rectangular structure on the northern side of Excavation Unit 2. It was 5.5 meters (18.0 feet) long by 2.8 meters (9.2 feet) wide. It is presented in Figure 53. This is not a clear or distinct structure, but fits in with several of the others in orientation of 23 degrees south of east. There were no obvious interior posts, although this was the norm. It is odd that there seem to be no posts in the short northwestern wall, although these may have been shallow and thus lost in the plow zone. It was located just southeast of the series of features in Excavation Unit 2. The structure may have been paired with Structure 8. Figure 56 shows Structure 9 along with Structures 7 and 8 at the same time. Finally, Figure 57 shows all the rectangular structures minus Structure 6. This clearly shows how all are oriented in the same direction and form a small three-sided compound.

Sequence of Structures Based Upon Artifacts

Table 22 shows all the sherds from the post molds for each of the nine structures defined here. Unfortunately they do not help put the structures in a chronological sequence. First, the number of sherds that are neither plain, nor tiny (<1/2 inch) sherdlets is very small. Second, the real question of dating, which was already apparent, was could we separate structures that were of the Scull Shoals phase of the Savannah period from the immediately following Duvall phase of the Lamar period? Of all the sherds recovered, the only ones that might have been of value in this exercise were the incised ones and the folded rim sherds, both of which, theoretically, begin with the Lamar period. Unfortunately no structure has more than a couple of these, and such low numbers could be random indicators and not worthy of forcing a decision. It is indeed noteworthy how few Lamar period indicators are in all the post holes. This supports the conclusion that the vast majority of these structures likely date just to the Savannah period.

It is unfortunate that the sherds from the post holes have not permitted us to separate the structures chronologically. We must resort to superposition alone. In conclusion here, however, is one simple interesting bit of information from Table 22. The bead, adorno, and pipe fragments, rare as they are, were all from Structure 2, the most central round structure's posts.

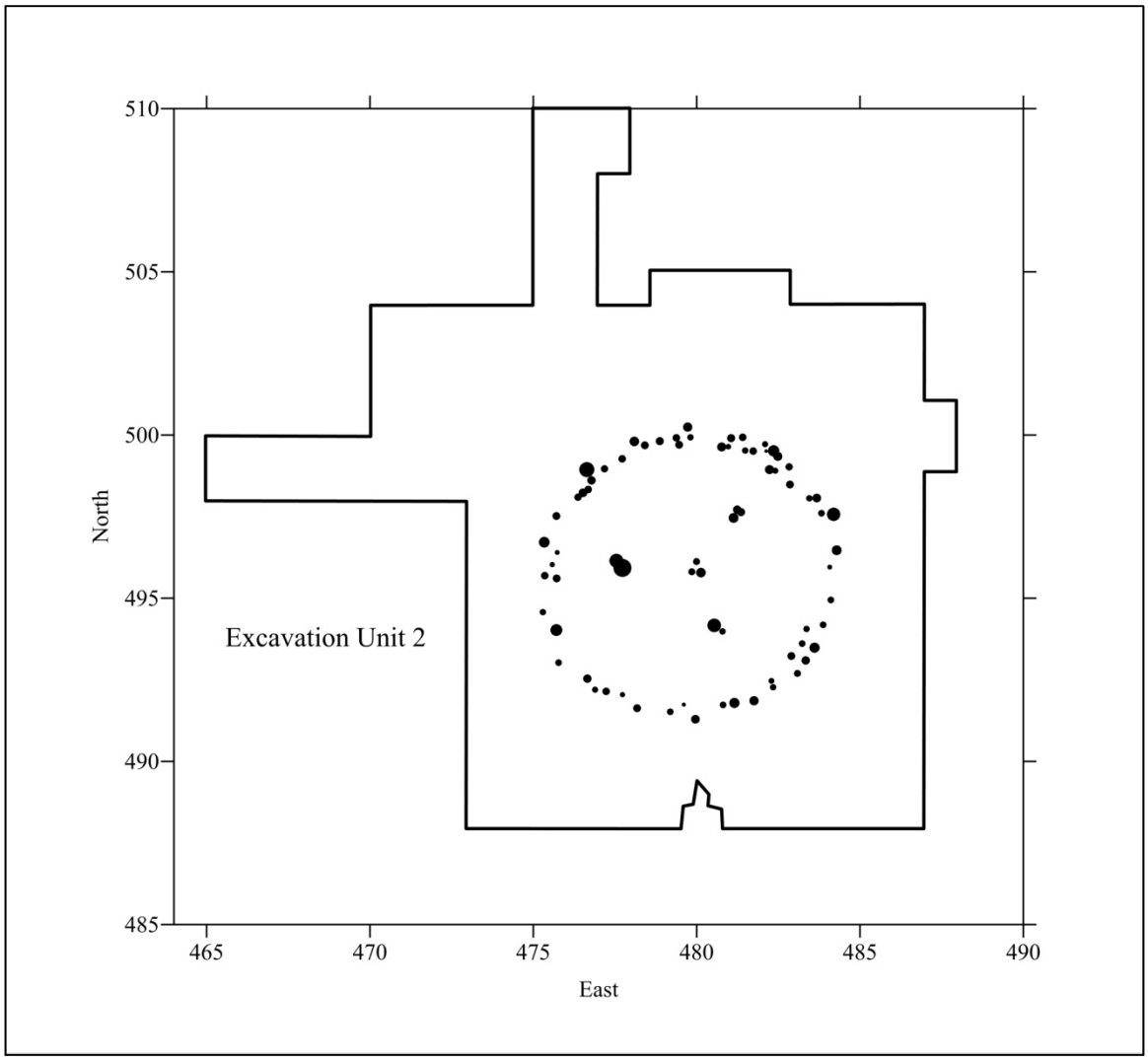

Figure 46. Excavation Unit 2, Structure 1 (Grid in Meters).

Plate 23. 2008, Structure 1, Looking West.

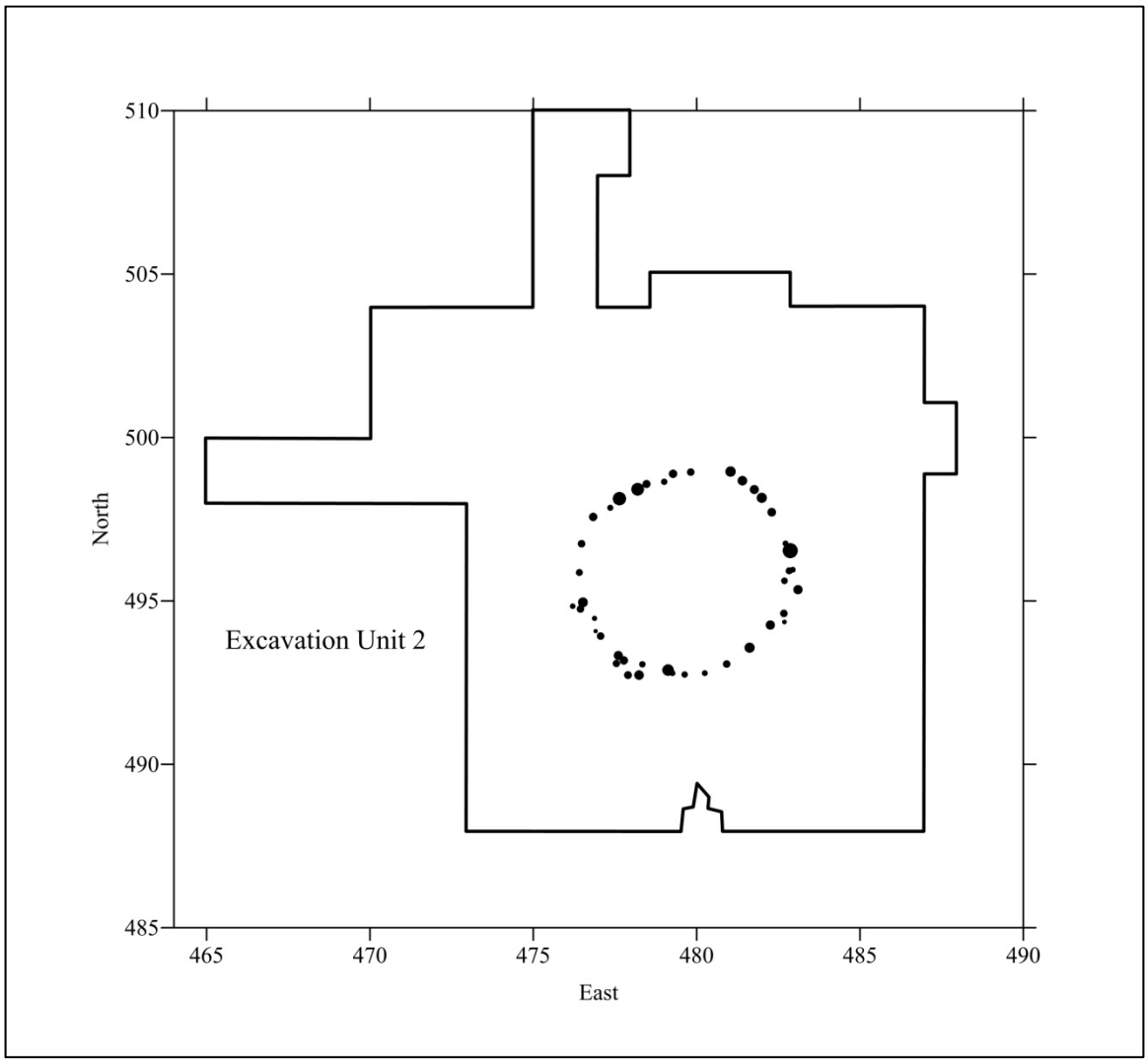

Figure 47. Excavation Unit 2, Structure 2 (Grid in Meters).

Plate 24. 2008, Structure 1 and Structure 2, Looking West.

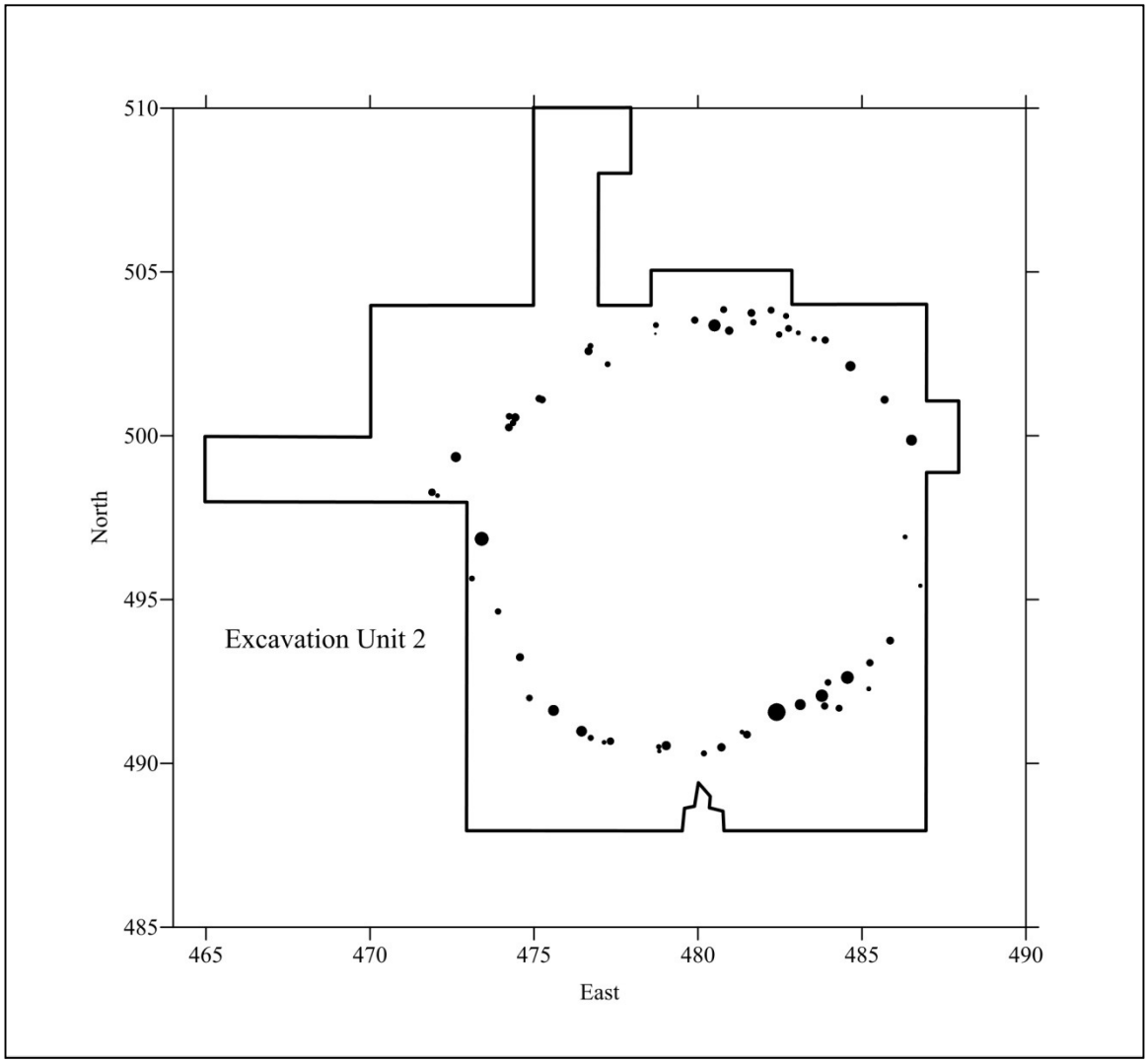

Figure 48. Excavation Unit 2, Structure 3 (Grid in Meters).

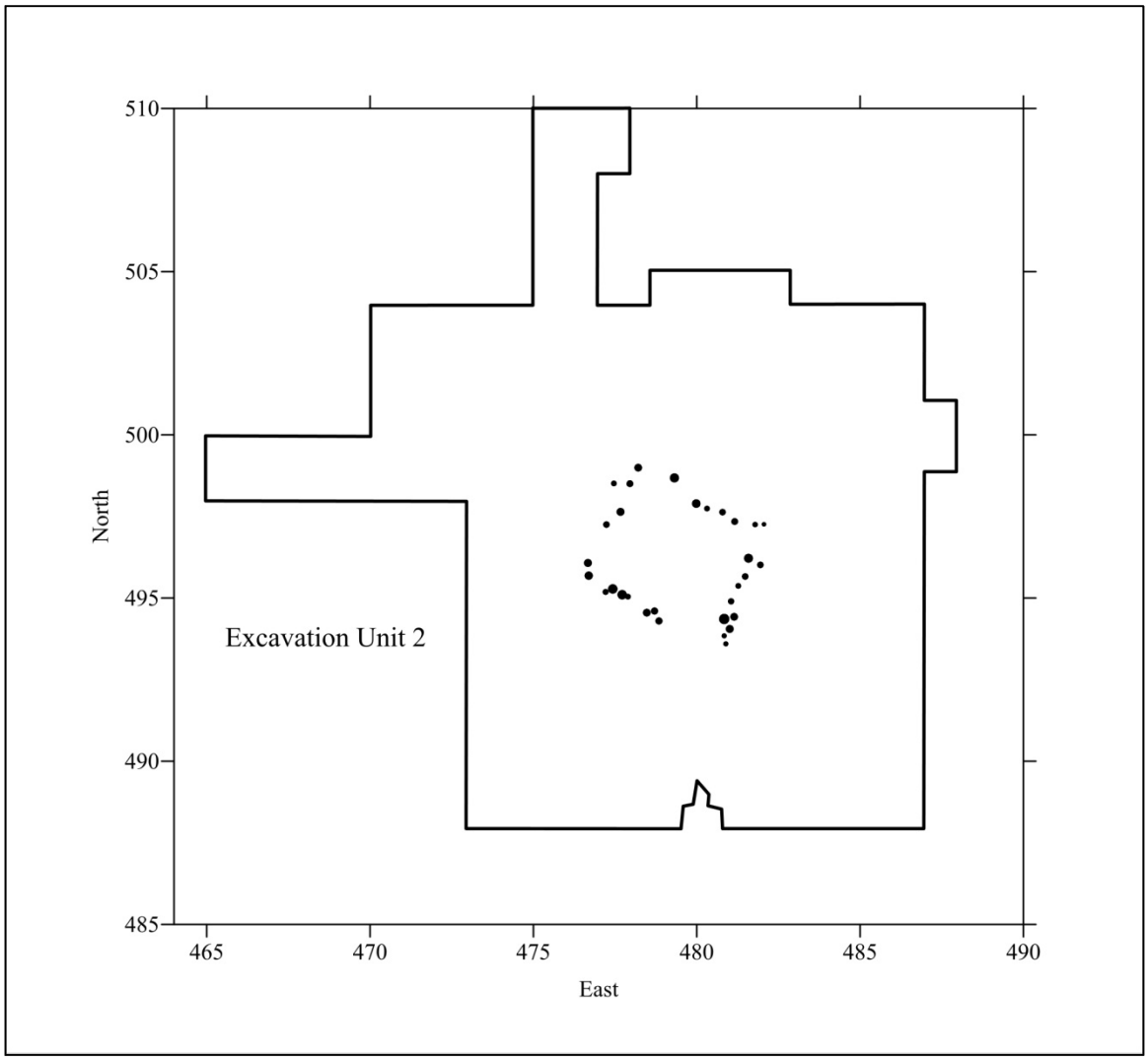

Figure 49. Excavation Unit 2, Structure 4 (Grid in Meters).

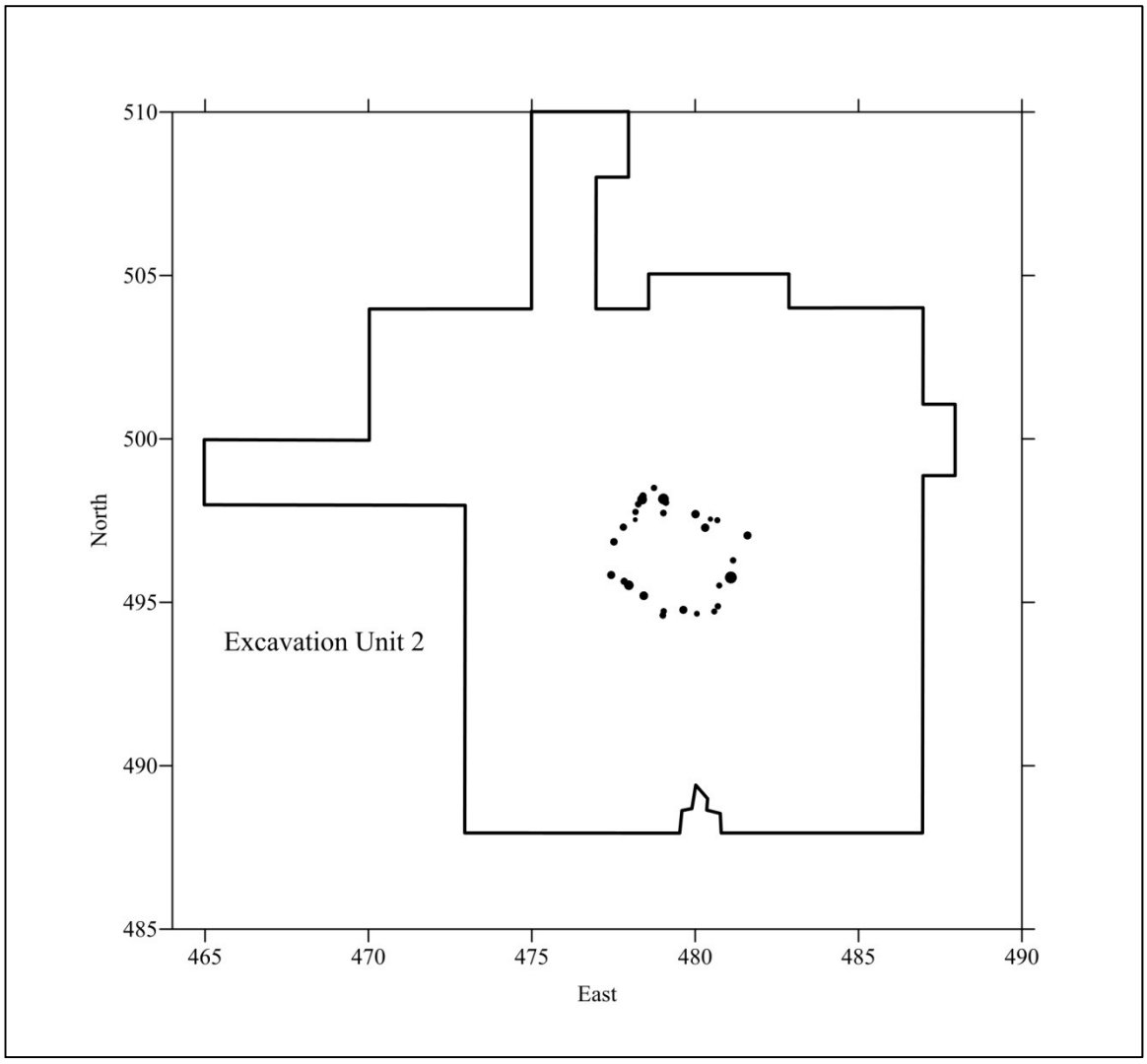

Figure 50. Excavation Unit 2, Structure 5 (Grid in Meters).

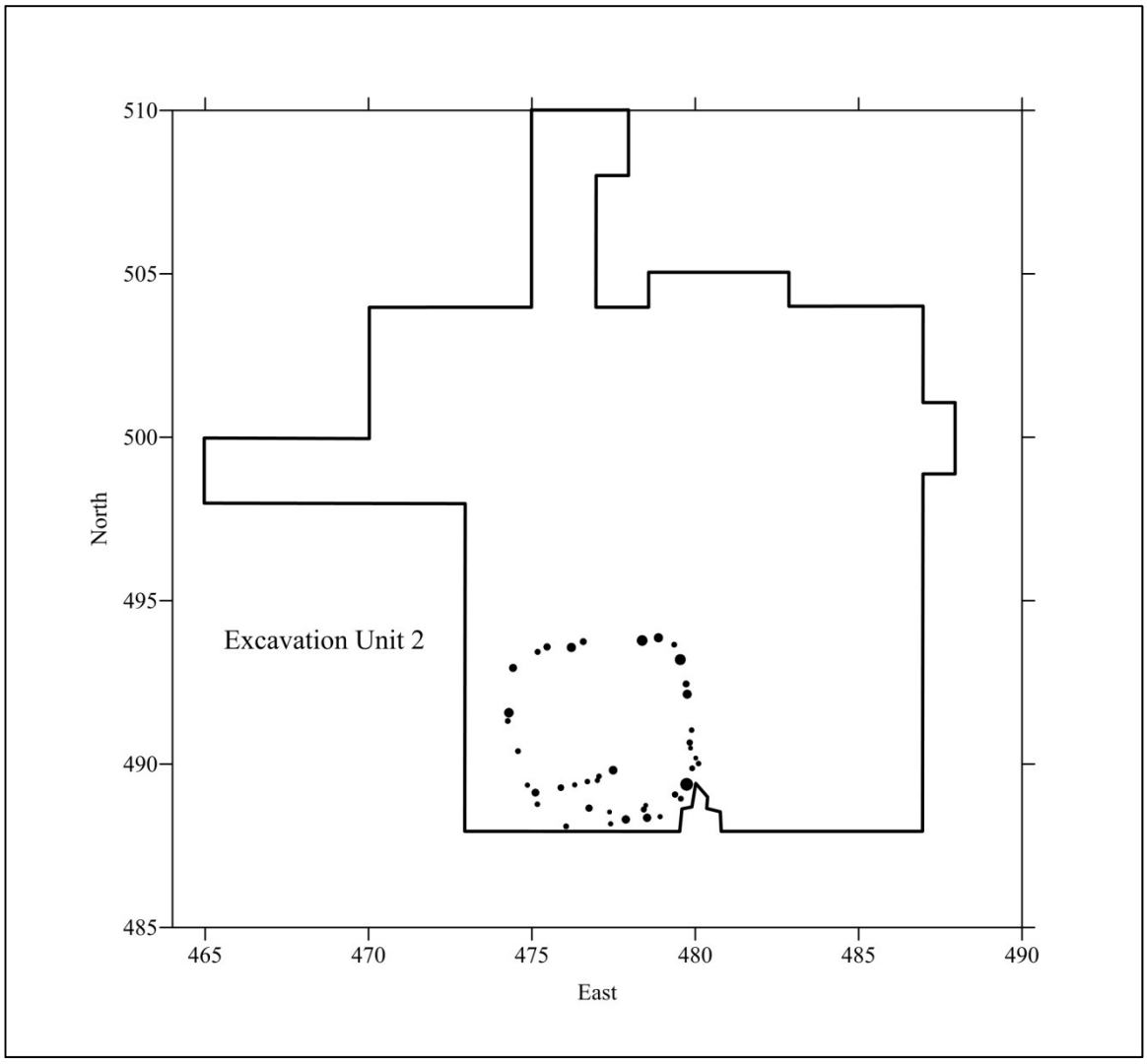

Figure 51. Excavation Unit 2, Structure 6 (Grid in Meters).

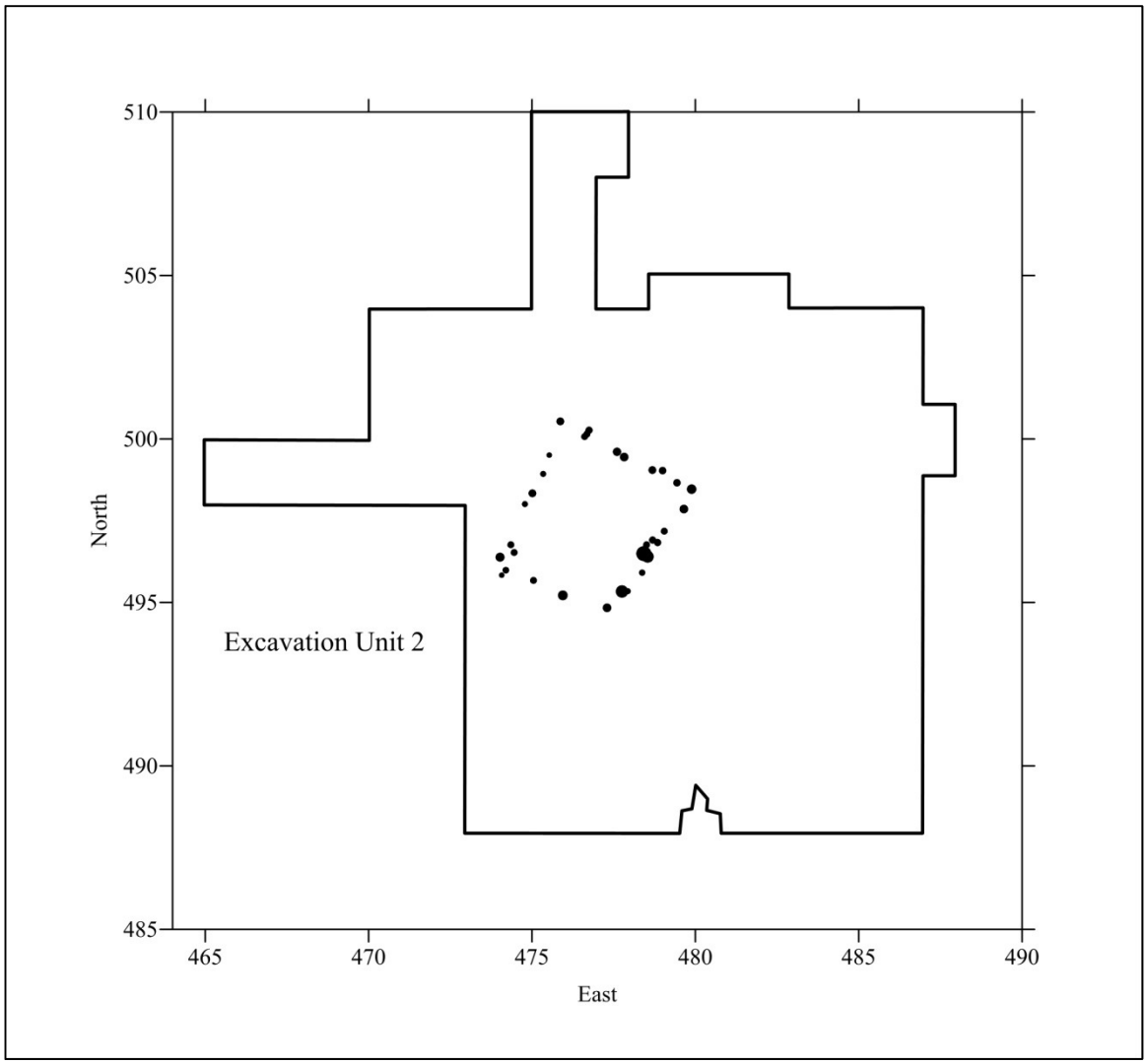

Figure 52. Excavation Unit 2, Structure 7 (Grid in Meters).

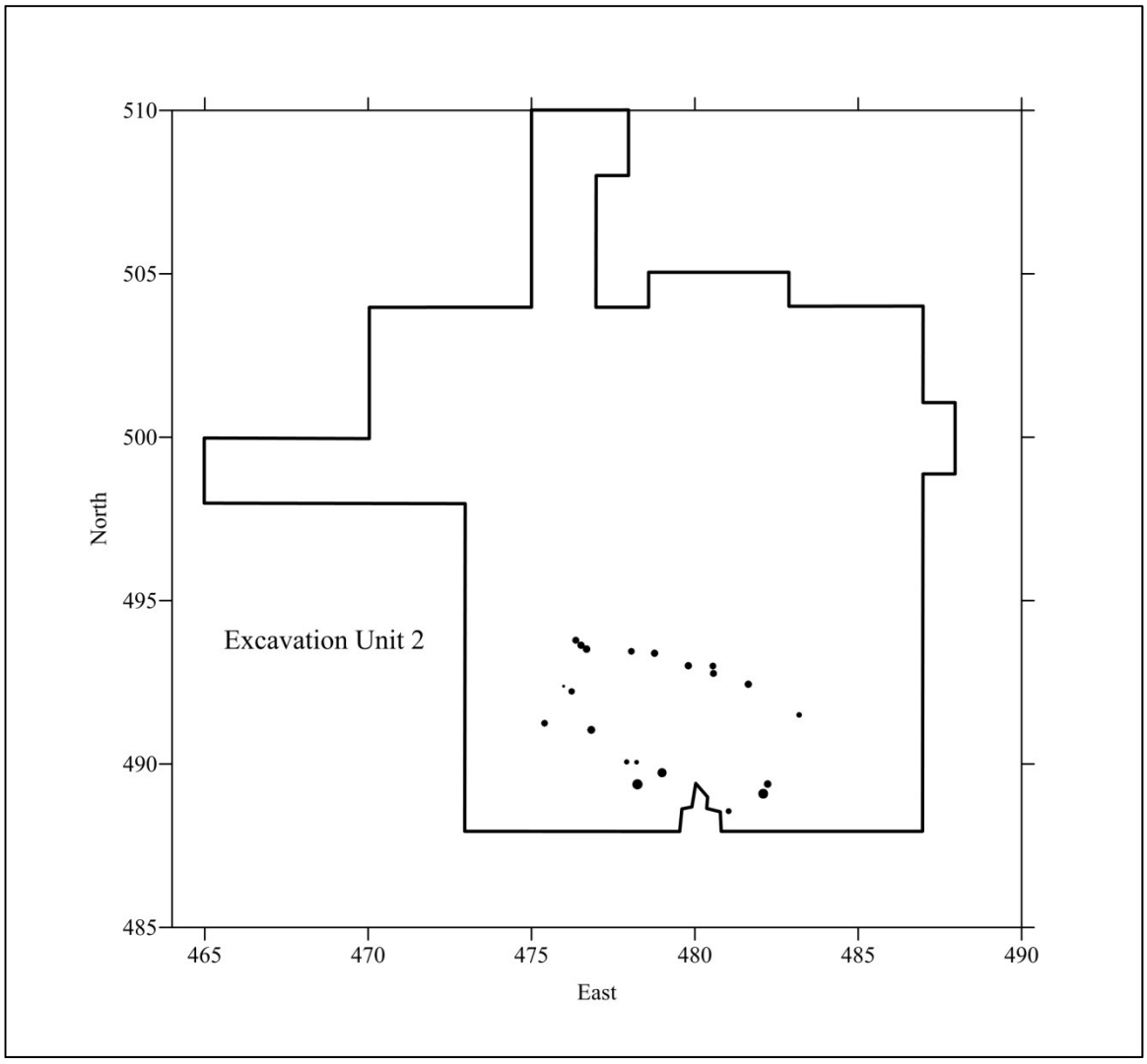

Figure 53. Excavation Unit 2, Structure 8 (Grid in Meters).

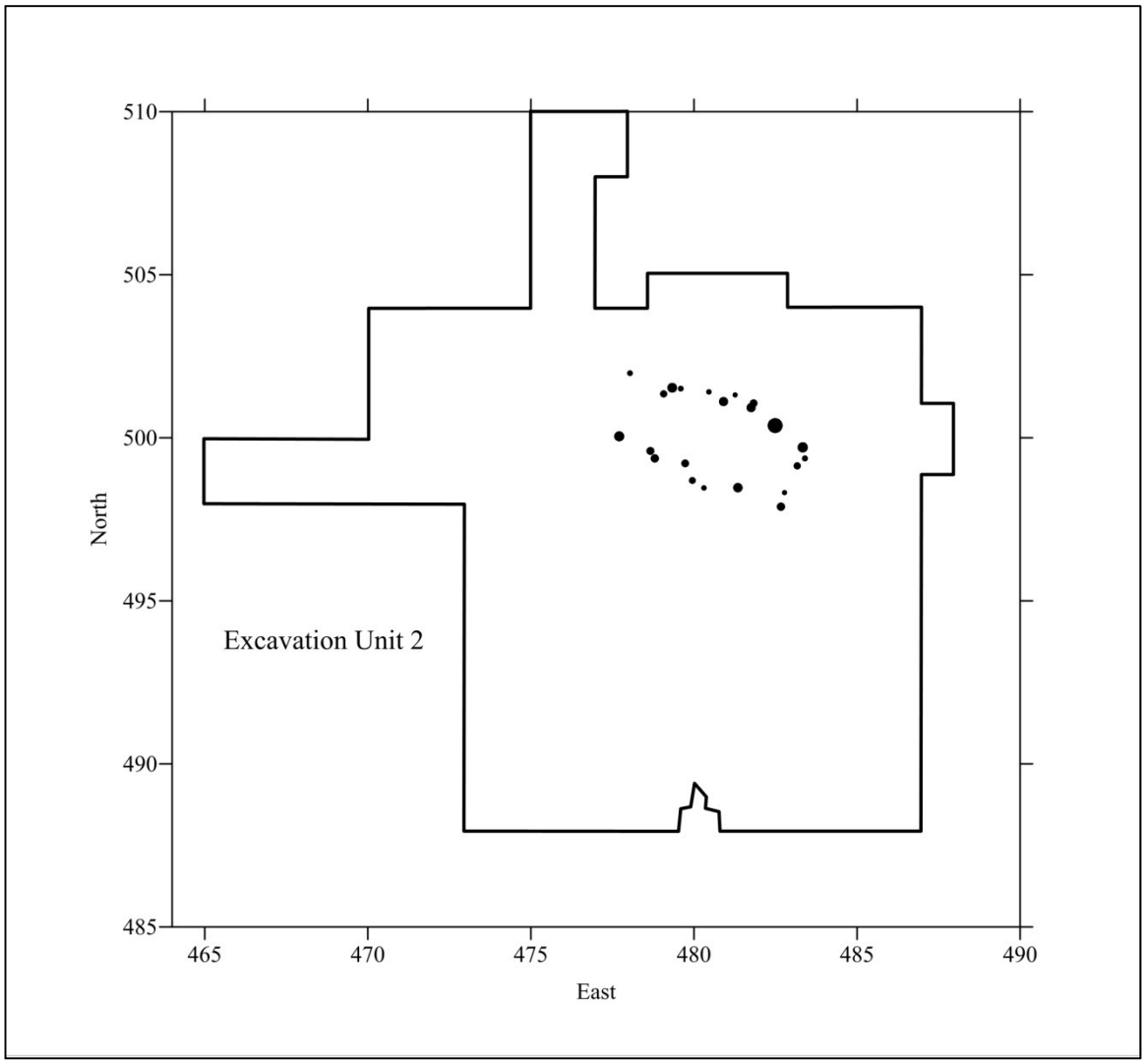

Figure 54. Excavation Unit 2, Structure 9 (Grid in Meters).

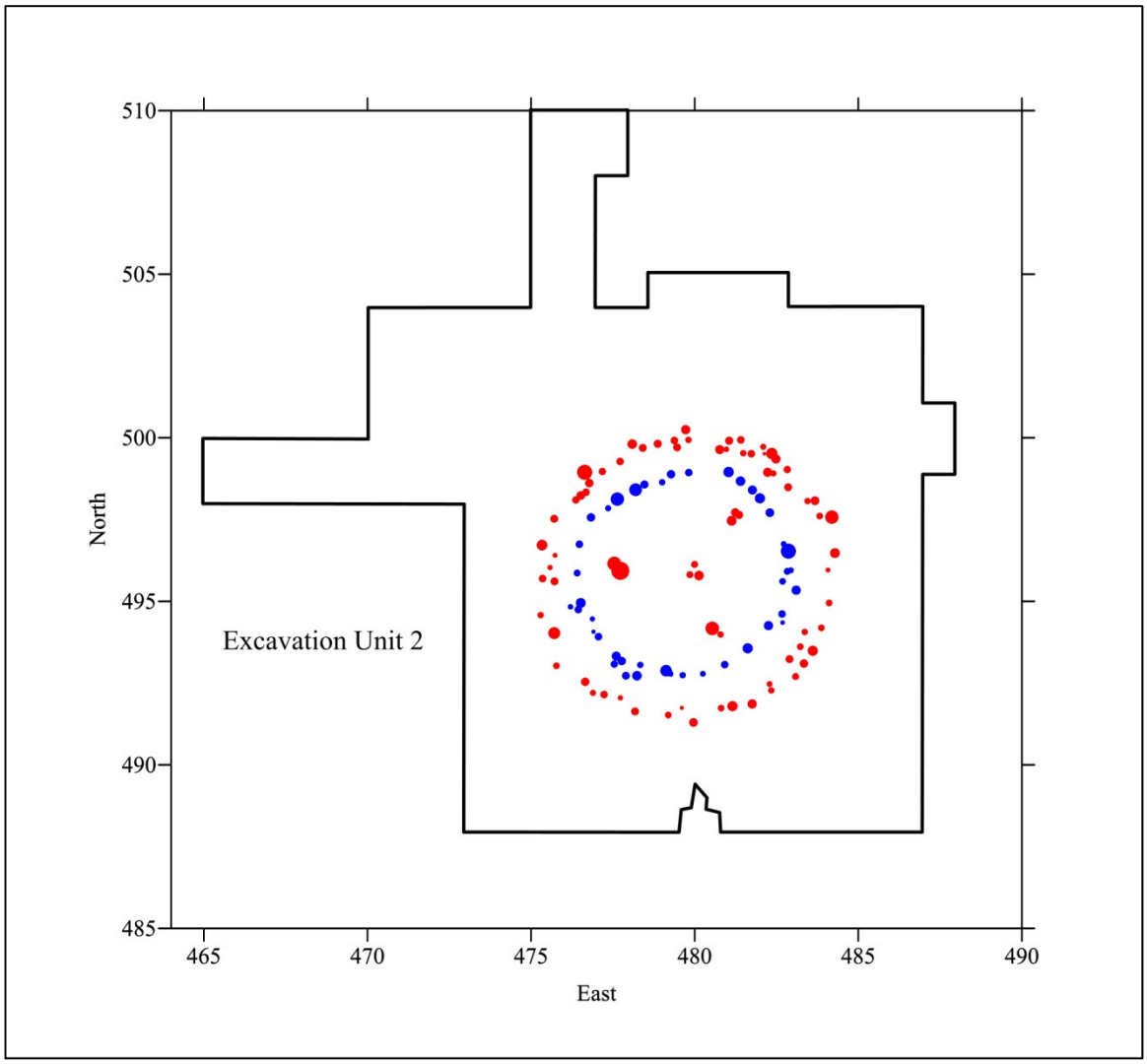

Figure 55. Excavation Unit 2, Structure 1 and 2 (Grid in Meters).

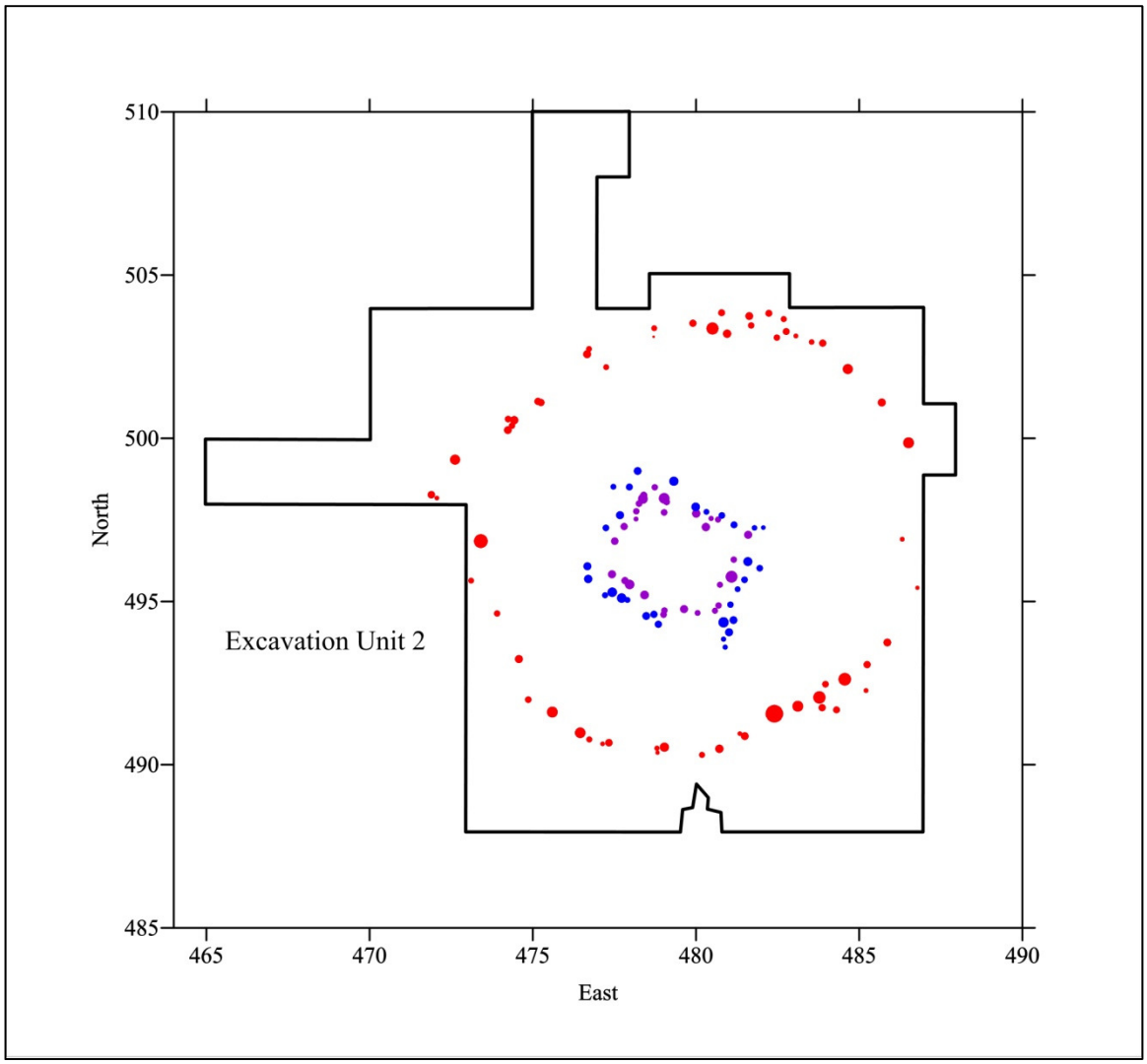

Figure 56. Excavation Unit 2, Structures 3, 4, and 5 (Grid in Meters).

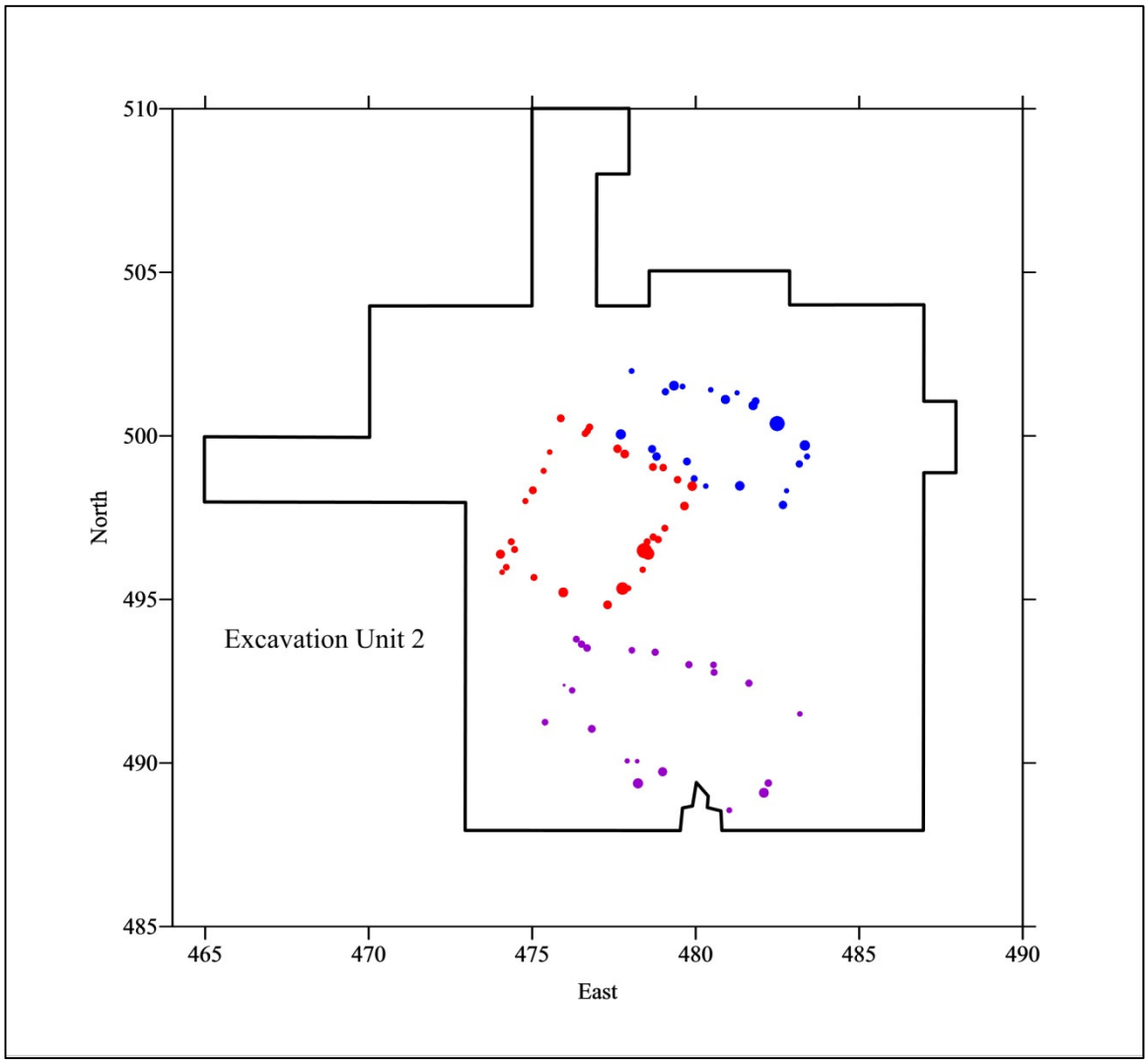

Figure 57. Excavation Unit 2, Structures 7, 8, and 9 (Grid in Meters).

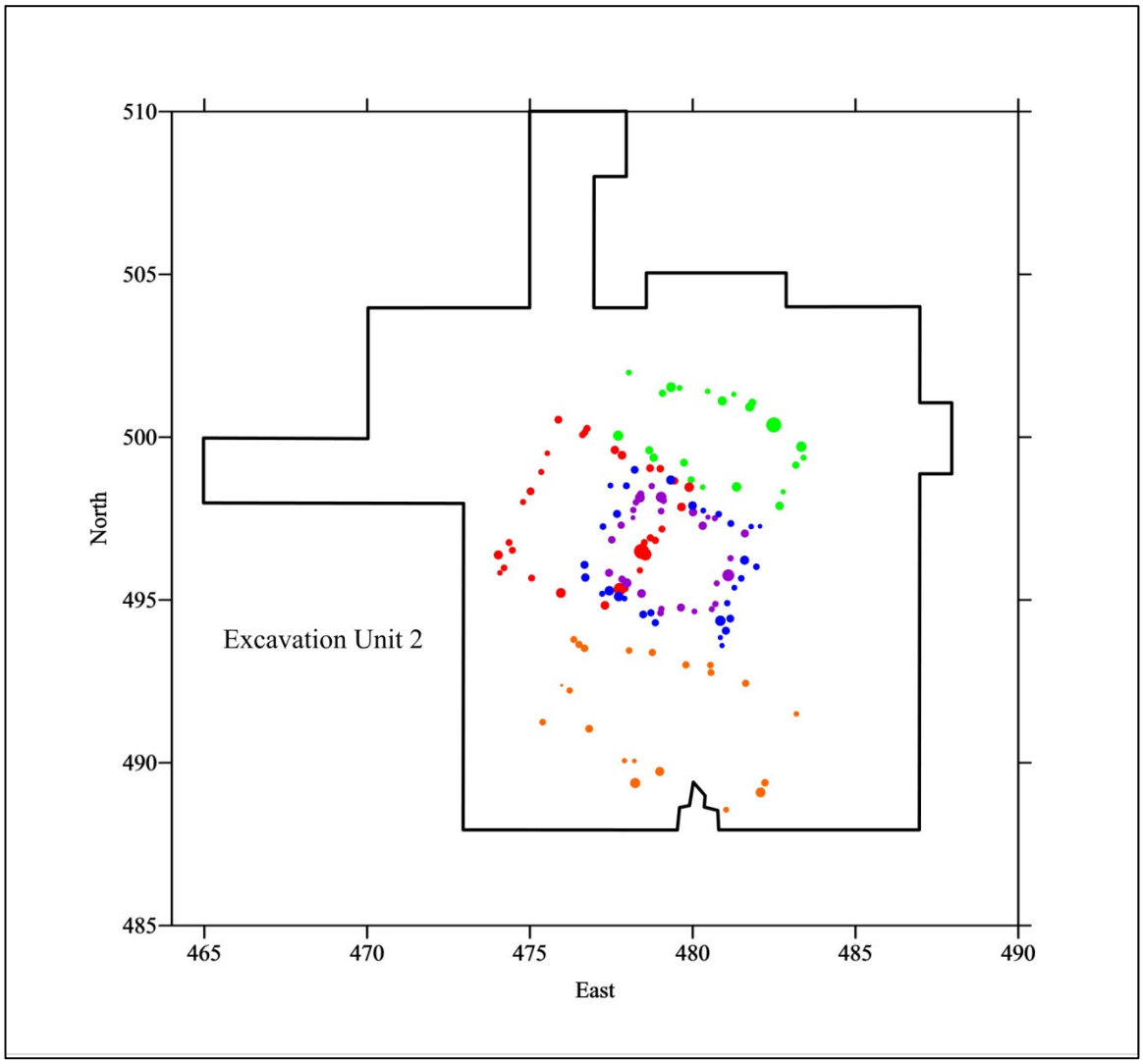

Figure 58. Excavation Unit 2, Structures 4, 5, 7, 8, and 9 (Grid in Meters).

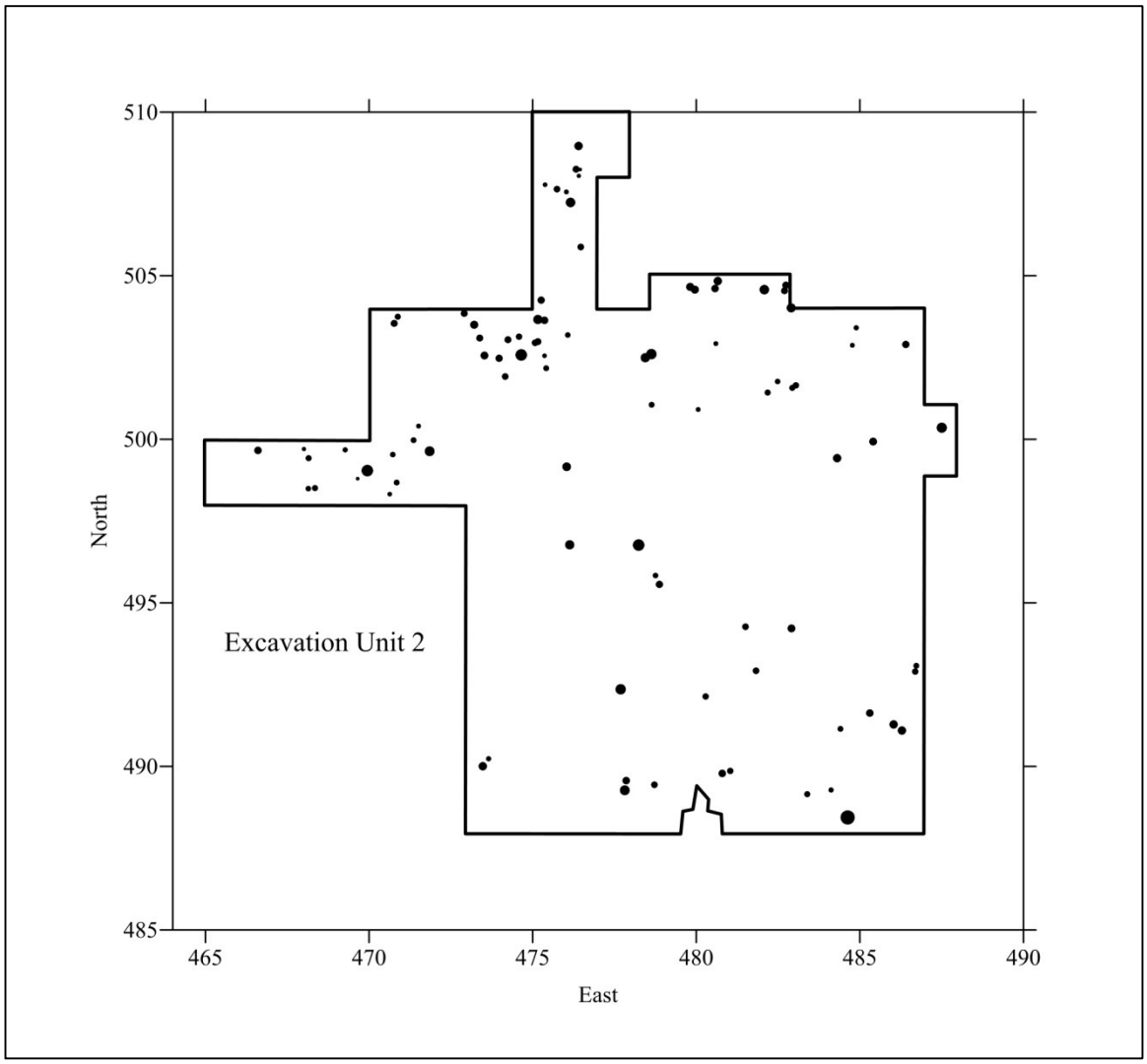

Figure 59. Excavation Unit 2, Unassigned Post Molds (Grid in Meters).

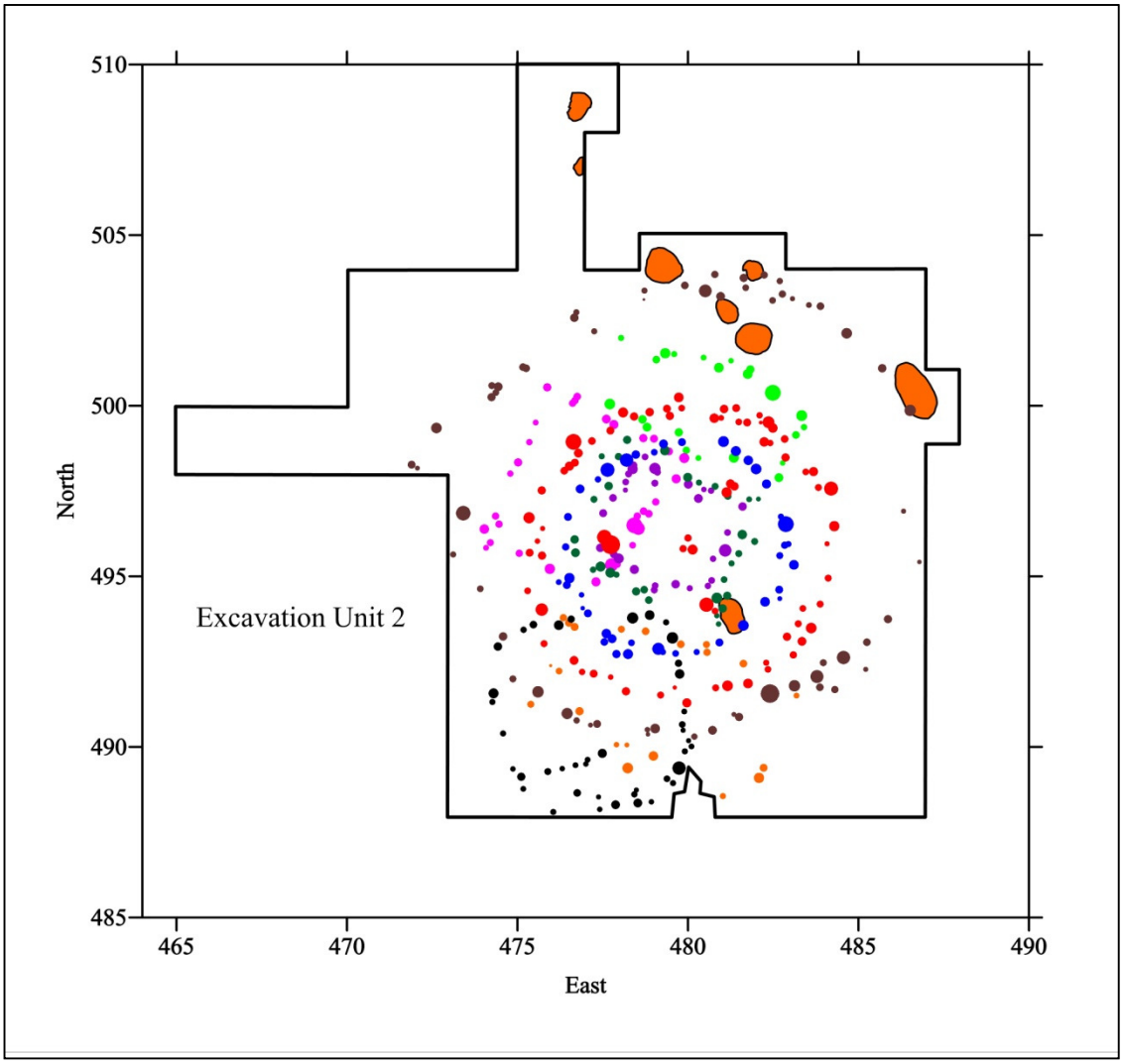

Figure 60. Excavation Unit 2, All Defined Structures and Features (Grid in Meters).

Structure	1	2	3	4	5	6	7	8	9	Totals
Plain Body	110	115	216	65	20	67	46	32	22	693
Burnished Plain Body	0	0	2	1	0	0	1	0	1	5
Complicated Stamped Body	18	20	15	12	5	5	9	2	5	91
Incised Body	2	2	3	0	2	2	1	0	0	12
Simple Stamped Body	2	0	7	0	1	1	0	0	0	11
Check Stamp Body	7	4	5	3	0	4	1	1	1	26
Check Stamped / Incised Body	1	0	0	0	0	0	0	0	0	1
Cob Impressed Body	5	0	0	1	0	0	0	0	0	6
Simple, Plain Rim	8	4	6	7	0	3	3	1	0	32
Simple, Burnished Plain Rim	0	0	0	0	0	1	0	0	0	1
Simple, Complicated Stamped Rim	0	0	0	1	0	0	0	0	0	1
Simple, Punctated Rim	0	0	2	0	0	0	0	0	0	2
Folded, Plain Rim	1	0	0	0	1	0	1	0	0	3
Rolled, Plain Rim	2	1	4	0	0	1	0	0	0	8
Rolled, Complicated Stamped Rim	0	1	1	0	0	0	0	2	0	4
Rolled, Check Stamped Rim	0	0	0	0	0	1	0	0	0	1
Rolled, Incised / Stamped Rim	0	0	1	0	0	0	0	0	0	1
Questionable Ceramic	0	0	0	0	1	0	0	0	0	1
Pottery Disk	0	0	0	1	0	0	0	0	0	1
Effigy	0	0	0	0	0	0	0	1	0	1
Adorno	0	2	0	0	0	0	0	0	0	2
Bead	0	1	0	0	0	0	0	0	0	1
Pipe Rim	0	1	0	0	0	0	0	0	0	1
Sherdlet	135	21	102	131	17	37	37	20	11	511
Totals	291	172	364	222	47	122	99	59	40	1416

Table 22. Sherds from Post Molds in Structures 1-9.

Screened Unit Artifact Analysis

In addition to the specific artifact analyses discussed above with the shovel tests and posts molds, there were a moderately large number of artifacts recovered from the screened units at the site. As was explained above, these were considered a continuation of the 16 2 by 2 meter units screened during the 1991 work at the Copeland site. The data from these units are presented here in Tables 23 and 24. Table 23 presents the ceramic counts, and Table 24 presents the lithic materials as well as some other miscellaneous categories of artifacts.

The Screened Units were associated with the Excavation Unit in the following manner. Screened Unit 17 was the center of what became Excavation Unit 3 and Screened Unit 18 was the center of Excavation Unit 4. Screened Unit 19 was not part of a larger Excavation Unit. It was placed to investigate the area around a single very productive shovel test (Number 23). Oddly, the shovel test apparently contained the only large sherd fragment in the area where Excavation Unit 19 was then placed. Plate 25 shows a reconstructed fragment from Shovel Test 230. It was from a vessel decorated with a 2-bar cross circle design that dates from the Savannah period. Finally, Screened Units 20 and 21 together formed Excavation Unit 6.

Just as before with the post mold sherds, the predominant period represented by the sherds was the Savannah period. There is also a limited Lamar period association here. The majority of the incised sherds and the folded rim sherds should date to the Lamar period. This is particularly true of the Morgan Incised and the cane punctated folded rim sherds. Some of the incised sherds may data to the Savannah period, but this is difficult to assess. The known Savannah period minority types of check stamped, red filmed, and burnished plain are all present (Williams 1991).

The broad distribution of these units is as follows. Screened Units 17-19 are all near the center of the site and Screened Units 20 and 21 are in the northwestern part of the site. I see no particular significant differences in the distribution of the various ceramics types over the site based upon these data. Both Lamar and Savannah indicators are present in all areas. I take this to likely mean that the site was not separately used in these two periods, but that the occupation and use of the entire site area straddled this artificial time line. To be more explicit, the use of the site was likely during about a 100 year period from perhaps A.D. 1300 to A.D. 1400. That is, the bulk was in the Savannah period, Scull Shoals phase (1250-1375), and small amount was in the Lamar period, Duvall phase (1375-1450). For a site that was used for perhaps 100 years (or even a bit more), there is a relatively limited amount of midden present.

Table 24 presents the data on a wide variety of miscellaneous artifacts from the five Screened Units. Remembering that Units 17-19 are from the core of the site and Units 20-21 are from the northwestern part, I see no clear differences or patterns in these data. Chert flakes are less common in the northwestern area, while quartz flakes may be a bit more common there. Pebbles that are red (and thus directly heated in a fire) are less than half as common as the unfired (white) pebbles. Both are present in the center and the northwestern part of the site. Animal bone may be a bit less common in the northwest, but I do not consider this a clear pattern since fine screening would need to be employed to determine this with confidence. As discussed earlier, animal bone

preservation at the site is very poor at best. In short, the pattern of the miscellaneous artifacts follows that of the ceramics discussed in the previous paragraph.

Plate 25. Sherd from Shovel Test 230.

Screened Unit	17	18	19	20	21	Totals
Plain Body	431	474	274	483	240	1902
Unidentified Complicated Stamped Body	98	102	187	66	82	535
Burnished Plain Body	0	6	1	0	0	7
Red Filmed Body	0	0	0	3	0	3
Check Stamped Body	2	1	0	0	4	7
Simple Stamped Body	0	0	0	0	3	3
Line Block Stamped Body	0	1	0	0	0	1
1-Bar Rounded Cross Diamond Body	0	1	0	0	0	1
2-Bar Rounded Diamond Body	1	0	0	0	0	1
Incised Body	20	18	18	21	27	104
Fine Incised body	0	0	0	1	0	1
Morgan Incised Body	0	0	0	0	4	4
Punctated Body	0	0	5	2	2	9
Simple, Plain Rims	22	20	20	38	34	134
Simple, Complicated Stamped Rims	0	0	0	0	1	1
Simple, Incised Rims	0	0	3	0	4	7
Simple, Check Stamped Rims	0	0	0	0	1	1
Simple, Cane Punctated Rims	0	0	0	0	1	1
Folded, Cane Punctated Rims	4	2	9	0	0	15
Folded, Incised Rims	0	0	0	0	1	1
Folded, Pinched Rims	3	2	0	0	0	5
Folded, Simple Stamped Rims	0	0	0	0	1	1
Folded, Pinched Rim with Morgan Incising	1	0	0	0	0	1
Rolled, Plain Rims	7	12	2	2	0	23
Rolled, Simple Stamped Rims	0	0	0	0	1	1
Coil Fragment	0	1	1	1	0	3
Disk	0	0	0	0	3	3
Bead	0	0	0	1	1	2
Node	2	0	0	0	0	2
Pipe Fragment	0	0	2	1	1	4
Other Ceramic	0	0	0	0	1	1
Sherdlets	1767	1446	1234	1593	1138	7178
Totals	591	640	522	619	412	2784
All Incised	21	18	21	22	36	118

Table 23. Ceramic Numbers from Screened Squares.

Screened Unit		17	18	19	20	21	Totals
Animal Bone	N	44	32	14	14	7	111
	Grams	190.0	12.0	7.0	2.5	1.5	213
Charcoal	Grams	0.0	0.0	11.0	0.0	1.0	12
Daub	Grams	263.0	350.0	559.0	250.0	1085.0	2507
Unmodified Rocks	Grams	733.0	671.0	724.0	1056.0	1521.0	4705
Red Pebbles	N	33	67	49	45	13	207
	Grams	60	107	81.3	60.0	15.0	323.3
White Pebbles	N	76	113	124	101	65	479
	Grams	177	190	162.8	222.0	96.0	847.8
All Pebbles	N	109	180	173	146	78	686
	Grams	237.0	297.0	244.1	282.0	111.0	1171.1
Hematite	Grams	0.5	1.0	7.8	7.0	9.5	25.8
Granite	N	0	26	4	0	0	30
Graphite	N	1	0	0	0	0	1
Unidentified Groundstone	N	0	0	0	1	0	1
Bifaces	N	0	0	5	0	0	5
Quartz Flakes	N	49	13	13	75	45	195
Quartz Shatter	N	14	195	78	1	0	288
Quartz PPK	N	0	0	1	0	0	1
Quartz Core	N	0	0	1	2	1	4
Quartz Biface	N	3	0	3	0	0	6
R&V Chert	N	0	1	2	0	0	3
CP Chert PPK	N	0	0	0	2	0	2
CP Chert Biface	N	1	0	0	0	0	1
NTA CP Chert Flake	N	0	3	14	4	2	23
TA CP Chert Flake	N	18	1	46	0	0	65
Metadacite Flake	N	9	7	0	0	0	16
Diabase Flake	N	11	0	1	4	0	16

Table 24. Miscellaneous Artifacts from Screened Squares

R&V = Ridge & Valley; CP = Coastal Plain; TA = Thermally Altered; NTA = Non Thermally Altered
N = Number; Grams = Weight

Conclusions and Recommendations

The project reported here was designed to address the question of the social function of the Copeland site. Secondary goals included more accurate dating of the site and more accurately characterizing the distribution of the artifacts over the site. I believe that we were successful on all fronts. The most important question related to whether the site was likely the focus of busk ceremonials or was better interpreted as a normal nucleated village.

There are two parallel sets of evidence that support the odd nature of the Copeland site's form. The first, and the one that has not been examined much further during this project, is the data from the 1991 test excavation that show the presence of post molds only at the very center of the site. This is in spite of the evidence that a light scatter of ceramics is present though a very large area. Why or how would there be ceramics without houses present on most of the site? My suggestion is that there were people here for just short periods of time—just as we know is the case in the case of busk ceremonialism (Swanton 1928).

The second line of evidence about the odd nature of the Copeland site is presence of the huge number of post molds located in Excavation Unit 2. There seems little about the structures located in Excavation Unit 2 that is "normal" for a Mississippian site in the Oconee Valley. There were at least nine structures of different forms built upon the same spot of ground in a relatively short period—probably not above 100 years. There was no evidence that there had ever been a mound located here.

The nine structures represent four basic forms. Structure 6 is a fairly typical Mississippian structure over much of the South. It is rectangular with rounded corners. It is also the structure that is least centered on the focal point of the remainder of the structures. There seems every reason to believe that this structure was either earlier or later than the rest of the structures. The artifacts in the post molds do not yield any clue, however.

The second basic form of structure includes small square or rectangular ones. These are all either at or arranged around the focal point of the rest of the structures. It seems hard to avoid the observation that these are very similar to the historic Square Ground arrangement of the Creek Indians. The orientation of all these structures (4, 5, 7, 8, and 9) is 23 degrees south of east—the angle of sunrise on the Winter solstice. It is also very curious that, unlike the historic arrangement, there is no cabin on the eastern side.

The third category of structure is Structure 3 by itself. This is a large rounded to sub-rectangular structure that is the largest of all the structures. It is centered on the focal point of the rest of the structures and is perhaps the most confusing of all the ones defined here. It seems unlike other structures I have seen at other sites, and seems difficult to tie in with the rest of the Copeland structures.

Finally, there are Structures 1 and 2, the circular structures centered again on the focal point of all the rest of the structures except Structure 6. These are analogous to historic so-called Council Houses or Rotundas. In comparison to similar structures at the Joe Bell site (9Mg28) and the Bullard Bottom site (9Pm169), the Copeland structures are small. Some archaeologists would likely interpret these as normal family structures, but their odd association with the rest of the structures and the strangeness of the rest of the

site belies this interpretation (Williams 1983, 2005). How many people could be seated inside Structure 1 is uncertain, but it was likely 30-40. Clearly some social selection from the entire dispersed community would have been necessary.

As for the future, I believe, first, that the area of the structures should be protected as the heart of the Copeland site. One of the potential things that threaten it is continued erosion of the gully southwest of the area. More effort should be put into stabilizing this part of the gully perhaps with vegetation (but not kudzu!). We placed many tree branches and sticks in the gully here, initially as a way to dispose of them from our work area, but later as the beginning of intentional stabilization of the gully near the structures. This stabilization should be continued.

The northwestern area of Excavation Unit 6 which produced some post molds and had a high density of artifacts should be explored with a northern block excavation at some point in the future. Perhaps there is a simple companion structure to the core area. Until this work is accomplished, however, its relationship to the core of the site from a social or functional point of view is unknown.

I believe that additional shovel tests at close intervals should continue to be placed in additional areas away from the center of the site. These will help define the patterns of artifact concentration at the site—always a vital tool for understanding any site.

I wish to comment here a bit further on the huge gulley at the Copeland site. We have not yet had the opportunity to have a qualified geologist see and comment on the huge feature, thus my comments here are suggestive only. In short, I believe that we should consider the possibility that the gully in some form may have been present when the Native Americans used the site or was accidentally created by them. The head of the gully is located just west of the center of the site. The Oconee River was located directly at the foot of the gully. Thus the most direct access to the site would have been up the hill from the river below directly through the current location of the present gully. If the gully was there, even partially, in A.D. 1300 it would have been the obvious vector for access to the site. If it was not there, and this location was used as the access route to the site, such a path might have been the instigating factor for the creation of the gully. Finally, if the gully was already present, the steep final climb out of it would end with the stunning view of the ceremonial center of the site. My personal guess is that much of the gully predates the archaeological site.

Another important aspect of the current project was to assess the relationship of the Copeland site to the Dyar Mound (9Ge5) located 1.6 kilometers to the northwest (Smith 1994). The assumption, based upon all the earlier work at the site, was that Copeland was used at the same time that the Dyar Mound was in use. Dyar was a small single mound site with only a small population. I have interpreted it as a chiefly compound occupied by a chief and his family (Williams 1995a). It is now clear that the major occupation at Copeland was during the Scull Shoals phase of the Savannah period (A.D. 1250-1350), a period when the Dyar site was essentially abandoned. The focus of mound use during this period in the upper Oconee Valley was at the Scull Shoals site 16 kilometers to the north. Thus the conclusion is inescapable that Copeland and Dyar were not used at the same time. This is not completely true since there is a small occupation during the early Lamar Duvall phase at Copeland, a period when Dyar was heavily reoccupied. In any event, this information should put to rest any idea that Copeland was

the location of "villagers" associated with the Dyar site. How Copeland may be related to Scull Shoals (9Ge4) remains to be seen. As a busk site, however, Copeland would likely have been drawing people from many kilometers in all directions, not just from the north where a chief lived at Scull Shoals.

Copeland is now recognized by the author as one of the earliest possible busk sites in the South. It is therefore important as a significant symbol of the social and religious patterns of Native Americans in Georgia. It certainly deserves its status as listed on the National Register of Historic Places of the United States. This elevated location should be visited and better appreciated by more Americans in the future. The research reported here should help future generations appreciate this special place in a more specific manner.

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Appendix 1.
Shovel Test Locations and Ceramic Data

ST Number	North	East	Sherd Number	Sherd Grams	Notes
1	499.00	520.17	8	7.0	
2	518.87	499.83	28	52.0	
3	498.90	480.02	16	20.8	
4	498.87	460.25	10	38.0	
5	478.88	519.97	27	31.2	
6	538.94	500.00	30	27.3	
7	518.93	520.06	22	10.6	
8	518.90	479.96	35	39.8	
9	490.42	519.67	17	15.8	
10	510.18	520.39	8	14.2	
11	528.58	500.34	14	9.1	
12	479.34	479.84	34	28.5	
13	510.82	500.37	6	5.7	
14	500.39	508.16	15	13.4	
15	499.37	491.39	20	40.0	
16	497.84	468.61	19	17.6	
17	510.46	509.89	13	19.7	
18	479.78	515.18	38	47.7	
19	479.61	509.98	11	10.7	
20	479.43	505.18	8	6.3	
21	479.47	499.59	14	13.9	
22	479.40	490.15	3	8.3	
23	488.28	479.31	30	39.3	
24	486.66	472.18	37	43.9	
25	477.77	471.18	35	36.0	
26	500.13	448.63	39	41.4	
27	500.17	437.52	11	18.1	
28	510.09	479.99	21	19.7	
29	511.75	469.72	28	20.1	
30	510.91	460.30	17	30.3	
31	519.28	470.39	5	2.2	
32	519.09	460.15	9	14.2	
33	519.51	489.91	19	23.9	
34	528.76	490.13	19	29.1	
35	538.52	490.16	11	16.7	
36	528.40	479.93	13	14.5	
37	537.87	479.97	7	4.0	
38	518.96	509.39	13	29.5	
39	528.32	510.14	17	25.0	
40	537.92	510.77	23	40.2	
41	538.83	521.07	19	37.9	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
42	530.19	521.24	13	6.4	
43	487.67	499.70	15	20.6	
44	489.36	510.37	15	21.5	
45	500.35	426.13	16	19.3	
46	500.29	415.26	17	31.6	
47	500.75	405.31	11	12.9	
48	501.83	395.26	10	10.3	
49	499.91	385.76	16	10.4	
50	519.84	449.79	13	22.5	
51	520.00	442.22	10	18.6	
52	518.29	433.84	14	12.3	
53	517.49	425.46	16	35.7	
54	517.30	416.22	10	14.0	
55	549.27	499.90	14	23.6	
56	557.81	499.95	18	15.1	
57	566.67	499.53	18	20.3	
58	547.66	489.96	5	28.9	
59	557.32	490.55	15	12.1	
60	567.13	490.13	10	14.4	
61	509.74	449.11	47	57.8	
62	509.53	439.11	10	17.4	
63	508.74	429.30	16	16.4	
64	517.34	397.34	24	35.5	
65	506.73	408.73	9	22.7	
66	490.77	491.63	43	58.8	
67	549.14	507.85	13	13.5	
68	557.47	508.80	15	27.4	
69	566.41	509.89	25	28.8	
70	565.80	519.27	15	20.6	
71	556.62	520.04	15	19.3	
72	548.30	518.20	15	25.4	
73	500.01	364.46	3	1.1	
74	500.01	353.16	2	0.9	
75	499.87	342.55	6	7.7	
76	510.09	417.95	20	21.3	
77	516.20	406.89	16	36.9	
78	499.77	374.88	3	14.1	
79	498.59	499.96	24	40.5	
80	510.15	489.67	42	48.2	
81	471.58	521.03	15	35.3	
82	470.32	511.48	20	30.0	
83	471.71	503.90	10	8.3	
84	471.30	498.43	1	0.9	
85	470.69	479.25	15	9.8	
86	471.50	486.45	10	6.5	
87	469.35	469.82	26	30.0	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
88	463.72	498.01	9	16.6	
89	462.29	504.35	14	11.3	
90	460.84	513.71	3	4.1	
91	451.75	515.26	24	23.4	
92	461.86	486.34	24	35.6	
93	454.13	497.57	13	16.5	
94	461.52	479.54	16	32.0	
95	461.75	470.09	4	2.5	
96	539.67	458.46	9	7.4	
97	537.35	439.07	40	42.9	
98	536.98	423.17	13	20.2	
99	536.19	400.70	13	31.7	
100	528.54	458.95	16	28.5	
101	526.80	439.25	32	38.1	
102	525.94	422.02	9	9.0	
103	525.55	400.07	17	20.7	Shell
104	523.40	380.69	11	14.5	
105	459.88	520.62	16	23.0	
106	450.63	519.83	17	31.2	
107	450.31	498.44	17	29.2	
108	449.27	481.03	26	30.7	
109	517.03	361.93	3	5.7	Historic Sherd
110	511.16	478.93	39	60.5	
111	505.08	478.89	43	59.9	
112	508.24	478.91	61	73.5	
113	519.20	495.34	15	13.3	
114	519.28	475.04	5	5.0	
115	519.20	465.33	45	36.3	
116	519.47	454.99	20	23.5	
117	520.02	446.18	35	30.9	
118	514.57	440.83	22	35.1	
119	515.02	449.58	16	18.0	
120	514.56	445.08	20	22.4	
121	514.90	460.49	24	38.4	
122	514.55	455.73	25	35.3	
123	515.56	470.05	27	31.1	
124	514.99	464.89	23	29.3	
125	514.96	476.09	26	28.7	
126	514.63	480.91	16	14.9	
127	514.18	486.07	34	56.2	
128	514.08	491.44	25	24.1	
129	514.71	495.33	11	17.0	
130	509.92	444.09	8	18.5	
131	509.92	454.72	14	18.8	
132	511.07	465.18	24	27.9	
133	511.44	474.96	20	30.4	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
134	509.89	483.95	23	33.5	
135	497.16	470.14	18	31.7	
136	501.13	470.21	38	40.6	
137	501.13	465.10	41	56.5	
138	514.75	500.07	16	18.4	
139	510.21	495.37	12	12.0	
140	504.71	500.72	34	53.3	
141	504.07	438.53	12	18.6	
142	505.10	495.10	35	53.1	
143	504.97	490.26	35	28.7	
144	504.33	443.89	28	38.9	
145	504.82	485.34	30	35.2	
146	504.36	448.65	11	10.2	
147	505.40	479.98	34	58.3	
148	506.18	474.98	35	38.4	
149	504.51	454.06	34	46.2	
150	506.03	470.18	27	26.9	
151	505.15	460.43	19	18.6	
152	499.28	495.70	37	56.3	
153	495.03	499.83	22	24.8	
154	505.96	464.96	30	27.6	
155	499.57	443.23	17	28.5	
156	499.38	487.64	35	55.2	
157	494.68	495.42	45	46.7	
158	499.20	454.64	16	20.0	
159	494.38	490.23	28	32.8	
160	494.10	485.33	15	17.5	
161	494.42	436.40	9	9.0	
162	493.59	441.79	21	28.0	
163	493.27	448.75	38	59.7	
164	493.44	453.73	15	26.6	
165	494.05	479.53	38	39.3	
166	493.57	459.31	16	20.4	
167	483.49	480.03	35	32.2	
168	493.89	464.89	34	56.1	
169	483.11	484.49	82	88.5	
170	494.40	470.07	26	62.9	
171	483.71	475.08	33	46.9	
172	482.82	490.09	29	46.9	
173	482.96	496.85	21	30.7	
174	479.26	475.23	70	73.4	
175	479.20	485.31	33	27.0	
176	485.04	501.30	24	46.6	
177	479.23	494.85	26	49.0	
178	490.09	495.52	27	31.8	
179	488.68	485.26	33	33.8	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
180	500.00	505.00	19	24.6	
181	500.00	515.00	14	17.6	
182	505.00	505.00	30	30.4	
183	505.00	510.00	32	46.7	
184	505.00	515.00	31	33.0	
185	505.00	520.00	26	30.3	
186	510.00	505.00	32	43.9	
187	510.00	515.00	19	30.0	
188	515.00	505.00	26	27.2	
189	515.00	510.00	22	23.1	
190	515.00	515.00	31	50.8	
191	515.00	520.00	16	16.1	
192	520.00	505.00	17	42.0	
193	520.00	515.00	20	30.5	
194	525.00	520.00	17	22.7	
195	525.00	515.00	21	50.9	
196	525.00	510.00	14	12.3	
197	525.00	505.00	18	25.3	
198	525.00	500.00	9	17.7	
199	525.00	495.00	14	9.2	
200	525.00	490.00	10	24.4	
201	525.00	485.00	10	9.9	
202	525.00	480.00	14	16.4	
203	525.00	475.00	11	25.5	
204	525.00	470.00	16	19.0	
205	525.00	465.00	12	18.7	
206	525.00	460.00	25	25.8	
207	525.00	455.00	15	21.0	
208	525.00	450.00	33	43.8	
209	525.00	445.00	13	28.9	
210	525.00	440.00	33	33.0	
211	525.00	435.00	30	33.3	
212	525.00	430.00	34	33.0	
213	530.00	450.00	16	18.5	
214	540.55	451.67	8	12.1	
215	530.00	430.00	17	33.2	
216	540.29	430.93	20	35.0	
217	530.00	470.00	10	11.6	
218	540.00	470.00	3	4.5	
219	495.00	505.00	23	16.9	
220	495.00	510.00	17	18.7	
221	495.00	515.00	11	20.0	
222	495.00	520.00	33	50.1	
223	490.00	505.00	21	35.2	
224	490.00	515.00	15	10.9	
225	485.00	505.00	16	16.5	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
226	485.00	510.00	14	17.9	
227	485.00	515.00	24	34.4	
228	485.00	520.00	28	31.8	
229	475.00	520.00	28	20.0	
230	475.00	515.00	85	442.0	Odd Extreme Value
231	475.00	510.00	26	31.0	
232	475.00	505.00	54	42.7	
233	475.00	500.00	28	37.7	
234	475.00	495.00	12	16.9	
235	475.00	490.00	8	8.6	
236	475.00	485.00	18	23.0	
237	475.00	480.00	26	31.6	
238	475.00	475.00	13	20.4	
239	475.00	470.00	25	44.9	
240	470.00	490.00	20	50.1	
241	465.00	520.00	26	42.0	
242	465.00	515.00	22	34.1	
243	465.00	510.00	44	53.2	
244	465.00	505.00	25	39.5	
245	465.00	500.00	17	27.9	
246	465.00	495.00	35	38.4	
247	465.00	490.00	24	39.2	
248	465.00	485.00	20	30.2	
249	465.00	480.00	22	29.8	
250	465.00	475.00	21	37.3	
251	465.00	470.00	39	43.4	
252	465.00	465.00	13	22.1	
253	465.00	525.00	9	4.3	
254	470.00	525.00	27	39.7	
255	475.00	525.00	25	31.2	
256	480.00	525.00	19	26.4	
257	485.00	525.00	16	16.4	
258	490.00	525.00	9	8.0	
259	495.00	525.00	15	16.3	
260	500.00	525.00	25	20.5	
261	505.00	525.00	16	16.5	
262	510.00	525.00	12	11.3	
263	515.00	525.00	4	3.5	
264	520.00	525.00	6	5.4	
265	525.00	525.00	5	5.5	
266	530.00	525.00	15	13.1	
267	535.00	525.00	10	10.7	
268	535.00	430.00	12	16.4	
269	535.35	436.59	22	46.4	
270	535.50	441.17	30	44.1	
271	535.73	446.12	15	22.3	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
272	535.00	450.00	21	42.2	
273	535.00	455.00	15	16.1	
274	535.00	460.00	17	32.1	
275	535.00	465.00	12	17.7	
276	535.00	470.00	17	24.5	
277	535.00	475.00	15	22.3	
278	535.00	480.00	14	21.5	
279	535.00	485.00	19	32.2	
280	535.00	490.00	27	38.2	
281	535.00	495.00	20	25.9	
282	535.00	500.00	19	25.7	
283	535.00	505.00	14	16.9	
284	535.00	510.00	6	10.4	
285	535.00	515.00	25	46.7	
286	535.00	520.00	17	21.9	
287	544.87	431.61	26	39.0	
288	544.23	437.61	23	25.8	
289	550.00	440.00	32	49.1	
290	545.15	442.02	21	22.9	
291	545.24	447.22	18	30.9	
292	549.86	479.99	20	22.0	
293	549.67	470.34	23	22.0	
294	550.06	460.15	7	9.0	
295	549.43	449.95	13	18.0	
296	549.45	440.18	29	44.0	
297	549.16	429.95	49	69.0	
298	559.64	480.20	22	20.0	
299	559.67	469.83	10	24.0	
300	559.44	460.15	11	23.0	
301	558.94	450.18	19	35.0	
302	558.51	440.21	15	19.0	
303	557.89	430.06	45	67.0	
304	564.68	479.88	9	7.0	
305	564.30	469.95	8	15.0	
306	562.54	460.25	14	16.0	
307	563.89	450.41	18	36.0	
308	563.86	439.68	41	52.0	
309	564.12	430.09	56	103.0	
310	548.72	418.78	20	24.0	
311	548.93	409.79	32	43.0	
312	548.41	399.95	38	52.0	
313	557.19	420.00	41	43.0	
314	557.05	410.02	25	31.0	
315	556.72	399.90	20	18.0	
316	563.65	420.06	26	53.0	
317	563.91	409.97	28	38.0	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
318	564.70	399.58	25	37.0	
319	574.35	410.72	10	18.0	
320	573.69	419.90	51	59.0	
321	573.58	430.31	64	66.0	
322	574.13	439.11	34	50.0	
323	583.85	410.18	14	27.0	
324	583.61	419.26	10	10.0	
325	583.26	430.39	20	18.0	
326	583.95	437.39	16	15.0	
327	574.27	399.24	2	3.0	
328	584.24	398.10	4	5.0	
329	584.27	450.68	32	40.0	
330	585.00	460.00	26	42.0	
331	574.36	450.63	23	34.0	
332	574.44	459.69	27	32.0	
333	569.16	430.67	10	8.0	
334	563.77	434.90	45	62.0	
335	563.89	425.10	25	29.0	
336	568.99	425.64	40	69.0	
337	569.51	435.72	17	27.0	
338	557.64	424.92	25	58.0	
339	558.67	435.21	36	48.0	
340	573.87	435.25	57	45.0	
341	573.83	425.19	33	60.0	
342	578.66	430.33	26	41.0	
343	578.45	435.39	46	79.0	
344	578.73	425.37	10	11.0	
345	584.41	469.31	16	18.0	
346	583.84	479.53	20	25.0	
347	584.00	490.00	13	15.0	
348	584.00	500.00	24	45.0	
349	584.00	510.00	23	23.0	
350	584.00	520.00	10	11.0	
351	574.84	469.95	22	41.0	
352	575.64	479.83	4	5.0	
353	576.09	489.62	6	5.0	
354	578.82	499.51	48	59.0	
355	575.00	510.00	18	42.0	
356	575.00	520.00	13	17.0	
357	595.00	480.00	31	37.0	
358	595.00	500.00	12	17.0	
359	595.00	520.00	21	23.0	
360	595.00	460.00	25	54.0	
361	595.00	440.00	13	16.0	
362	595.00	420.00	10	19.0	
363	595.00	400.00	10	16.0	

ST Number	North	East	Sherd Number	Sherd Grams	Notes
364	500.00	390.00	14	30.0	
365	520.00	390.00	12	23.0	
366	540.00	390.00	22	27.0	
367	560.00	390.00	9	10.0	
368	580.00	390.00	0	0.0	
369	500.00	540.00	12	18.0	
370	480.00	540.00	31	38.0	
371	460.00	540.00	13	23.0	
372	440.00	540.00	19	24.0	
373	520.00	540.00	10	12.0	
374	540.00	540.00	15	20.0	
375	560.00	540.00	13	18.0	
376	580.00	540.00	22	20.0	
377	560.00	380.00	2	1.0	
378	540.00	380.00	8	7.0	
379	530.00	410.00	23	37.0	
380	440.00	520.00	21	33.0	
381	440.00	500.00	22	33.0	
382	440.00	480.00	39	38.0	
383	440.00	460.00	13	18.0	
Totals			8073	11,132.5	

Appendix 2
Shovel Test Lithic Numbers

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	1	0	0	0	0	0	0	0	0	0	0	1
5	1	0	0	0	0	0	0	0	0	0	0	1
6	1	0	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	2	0	0	0	0	0	0	0	0	0	0	2
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	2	0	0	0	0	0	0	0	0	0	0	2
13	0	0	0	0	0	0	0	0	0	0	0	0
14	2	0	0	0	0	0	0	0	0	0	0	2
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	2	0	0	0	0	0	0	0	0	0	0	2
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	3	0	0	0	0	0	0	0	0	0	0	3
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	2	0	0	0	0	0	0	0	0	0	0	2
31	1	0	0	0	0	0	0	0	0	0	0	1
32	1	0	0	0	0	0	0	0	0	0	0	1
33	1	0	0	0	0	0	0	0	0	0	0	1
34	1	0	0	0	0	0	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0
38	0	1	0	0	0	0	0	0	0	0	0	1
39	1	0	0	0	0	0	0	0	0	0	0	1
40	1	0	0	0	0	0	0	0	0	0	0	1
41	0	0	0	0	0	0	0	0	0	0	0	0

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
42	0	0	0	0	0	0	0	0	0	0	0	0
43	1	0	0	0	0	0	0	0	0	0	0	1
44	0	0	0	0	0	1	0	0	0	0	0	1
45	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	1	0	0	0	1
48	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0
53	1	0	0	0	0	0	0	0	0	0	0	1
54	1	0	0	0	0	0	0	0	0	0	0	1
55	1	1	0	0	0	0	0	0	0	0	0	2
56	0	0	0	0	0	0	0	0	0	0	0	0
57	2	0	0	0	0	0	0	0	0	0	0	2
58	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
61	1	0	0	0	0	0	0	0	0	0	0	1
62	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	1	0	1
68	0	2	0	0	0	0	0	0	0	0	0	2
69	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0
72	2	0	0	0	0	0	0	0	0	0	0	2
73	0	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0	0
75	1	0	0	0	0	0	0	0	0	0	0	1
76	0	0	0	0	0	0	0	0	0	0	0	0
77	1	0	0	0	0	0	0	0	0	0	0	1
78	0	0	0	0	0	0	0	0	0	0	0	0
79	2	0	0	0	0	0	0	0	0	0	0	2
80	1	0	0	0	0	0	0	0	0	0	0	1
81	2	0	0	0	0	0	0	0	0	0	0	2
82	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0	0

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
87	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	1	0	1
100	0	0	0	0	0	0	0	0	0	0	0	0
101	1	0	0	0	0	0	0	0	0	0	0	1
102	1	0	0	0	0	0	0	0	0	0	0	1
103	0	0	0	0	0	0	0	0	0	1	0	1
104	0	0	0	0	0	0	0	0	0	0	0	0
105	2	0	0	0	0	0	0	0	0	0	0	2
106	0	0	0	0	0	0	0	0	0	0	0	0
107	1	0	0	0	0	0	0	0	0	1	0	2
108	0	0	0	0	0	0	0	0	0	0	0	0
109	1	0	0	0	0	0	0	0	0	0	0	1
110	2	0	0	0	0	0	0	0	0	0	0	2
111	1	0	0	0	0	0	0	0	0	0	0	1
112	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	1	0	0	0	0	0	1
114	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0
118	2	0	0	0	0	1	0	0	0	0	0	3
119	1	0	0	0	1	0	0	0	0	0	0	2
120	1	0	0	0	0	0	0	0	0	0	0	1
121	1	0	0	0	0	0	0	0	0	0	0	1
122	1	0	0	0	0	0	0	0	0	0	1	2
123	1	0	0	0	0	0	0	0	0	0	0	1
124	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	0	0	0	0	0	0	0	0	0
127	1	0	0	0	0	0	0	0	0	0	0	1
128	0	0	0	0	0	0	0	0	0	0	0	0
129	2	0	0	0	0	0	0	0	0	0	0	2
130	0	0	0	0	0	0	0	0	0	0	0	0
131	2	0	0	0	0	0	0	0	0	0	0	2

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
132	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0
134	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0
136	0	0	0	0	0	0	0	0	0	0	0	0
137	1	0	0	0	0	0	0	0	0	0	0	1
138	1	0	0	0	0	0	0	0	0	0	0	1
139	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0
146	0	0	0	0	0	1	0	0	0	0	0	1
147	0	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	0	0	0	0	0	0	0	0	0
149	2	0	0	0	0	0	0	0	0	0	0	2
150	0	0	0	0	0	0	0	0	0	0	0	0
151	1	0	0	0	0	0	0	0	0	0	0	1
152	0	0	0	0	0	0	0	0	0	0	0	0
153	1	0	0	0	0	0	0	0	0	0	0	1
154	4	0	0	0	0	0	0	0	0	0	0	4
155	5	0	0	0	0	0	0	0	0	0	0	5
156	1	0	0	0	0	0	0	0	0	0	0	1
157	1	0	0	0	0	0	0	0	0	0	0	1
158	1	0	0	0	0	0	0	0	0	0	0	1
159	1	0	0	0	0	0	0	0	0	0	0	1
160	0	0	0	0	0	0	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0
164	0	0	0	0	0	0	0	0	0	0	0	0
165	1	0	0	0	0	0	0	0	0	0	0	1
166	2	0	0	0	0	0	0	1	0	0	0	3
167	0	0	0	0	0	0	0	1	0	0	0	1
168	1	0	0	0	0	0	0	0	0	0	0	1
169	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0
174	1	0	0	0	0	0	0	0	0	0	0	1
175	1	0	0	0	0	0	0	0	0	0	0	1
176	0	0	0	0	0	0	0	0	0	0	0	0

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
177	1	0	0	0	0	0	0	0	0	0	0	1
178	0	0	0	0	1	0	0	0	0	0	0	1
179	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0
181	2	0	0	0	0	0	0	0	0	1	0	3
182	1	0	0	0	0	0	0	0	0	0	0	1
183	1	1	0	0	0	0	0	0	0	0	0	2
184	3	0	0	0	0	0	0	0	0	0	0	3
185	1	0	0	0	0	0	0	0	0	0	0	1
186	0	0	0	0	0	1	0	0	0	0	0	1
187	0	0	0	0	0	0	0	0	0	0	0	0
188	1	0	0	0	1	0	1	0	0	0	0	3
189	0	0	0	0	0	0	0	0	0	0	0	0
190	3	1	0	0	0	0	0	0	0	0	0	4
191	4	0	0	0	0	0	0	0	0	0	0	4
192	2	0	0	0	0	0	0	0	0	0	0	2
193	0	0	0	0	0	0	0	0	0	0	0	0
194	0	0	0	0	0	0	0	0	0	0	0	0
195	5	0	0	0	0	0	0	0	0	0	0	5
196	0	0	0	0	0	0	0	0	0	0	0	0
197	1	0	0	0	0	0	0	0	0	0	0	1
198	0	1	0	0	0	0	0	0	0	0	1	2
199	0	0	0	0	0	0	0	0	0	0	0	0
200	0	0	0	0	0	0	0	0	0	0	0	0
201	0	1	0	0	0	1	0	0	0	0	0	2
202	1	0	0	0	0	1	0	0	0	0	0	2
203	0	0	0	0	0	0	0	0	0	0	0	0
204	0	0	0	0	0	0	0	0	0	0	0	0
205	0	0	0	0	0	0	0	0	0	0	0	0
206	1	0	0	0	0	0	0	0	0	0	0	1
207	0	0	0	0	0	0	0	0	0	0	0	0
208	2	0	0	0	0	0	0	0	0	0	0	2
209	0	0	0	0	0	1	0	0	0	0	0	1
210	0	0	0	0	0	0	0	0	0	0	0	0
211	1	0	0	0	0	0	0	0	0	0	0	1
212	3	0	0	0	0	0	0	0	0	0	0	3
213	0	0	0	0	0	0	0	0	0	0	0	0
214	0	0	0	0	0	0	0	0	0	0	0	0
215	0	0	0	0	0	0	0	0	0	0	0	0
216	0	0	0	0	0	0	0	0	0	0	0	0
217	1	0	0	0	0	0	0	0	0	0	0	1
218	0	0	0	0	0	0	0	0	0	0	0	0
219	2	0	0	0	0	0	0	0	0	0	0	2
220	2	0	0	0	0	0	0	0	0	0	0	2
221	1	0	0	0	0	0	0	0	0	0	0	1

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
222	2	0	0	0	0	0	0	0	0	0	0	2
223	1	0	0	0	0	0	0	0	0	0	0	1
224	0	0	0	0	0	0	0	0	0	0	0	0
225	0	0	0	0	0	0	0	0	0	0	0	0
226	0	0	0	0	0	0	0	0	0	0	0	0
227	0	0	0	0	0	0	0	0	0	0	0	0
228	1	0	0	0	0	0	0	0	0	0	0	1
229	0	0	0	0	0	0	0	0	0	0	0	0
230	1	0	0	0	1	0	0	1	0	0	0	3
231	1	0	0	0	0	0	0	0	0	0	0	1
232	2	1	0	0	0	0	0	0	0	0	0	3
233	0	0	0	0	0	0	0	0	0	0	0	0
234	0	0	0	0	0	0	0	0	0	0	0	0
235	0	0	0	0	0	0	0	0	0	0	0	0
236	0	0	0	0	0	0	0	0	0	0	0	0
237	0	0	0	0	0	0	0	0	0	0	1	1
238	0	0	0	0	0	1	0	0	0	0	0	1
239	0	0	0	0	0	0	0	0	0	0	0	0
240	0	0	0	0	0	0	0	0	0	0	0	0
241	1	0	0	0	0	0	0	0	0	0	0	1
242	0	0	0	0	0	0	0	0	0	0	0	0
243	0	0	0	0	0	0	0	0	0	0	0	0
244	2	0	0	0	0	0	0	0	0	0	0	2
245	0	0	0	0	0	0	0	0	0	0	0	0
246	0	0	0	0	0	0	0	0	0	0	1	1
247	2	0	0	0	0	0	0	0	0	0	0	2
248	2	0	0	0	0	0	0	0	0	0	0	2
249	0	0	0	0	0	0	0	0	0	0	0	0
250	1	0	1	0	0	0	0	0	0	0	0	2
251	1	0	1	0	0	0	0	0	0	0	0	2
252	1	0	0	0	0	0	0	0	0	0	0	1
253	0	0	0	0	0	0	0	0	0	0	0	0
254	3	0	0	0	0	0	0	0	0	0	0	3
255	0	0	0	0	0	0	0	0	0	0	0	0
256	0	0	0	0	0	0	0	0	0	0	0	0
257	0	0	0	0	0	0	0	0	0	0	0	0
258	1	0	0	0	0	0	0	0	0	0	0	1
259	1	0	0	0	0	0	0	0	0	0	0	1
260	0	0	0	0	0	0	0	0	0	0	0	0
261	1	0	0	0	0	0	0	0	0	0	0	1
262	2	0	0	0	0	0	0	0	0	0	0	2
263	4	0	0	1	0	0	0	0	0	0	0	5
264	3	0	0	0	0	0	0	0	0	0	0	3
265	1	0	0	0	0	0	0	0	0	0	0	1
266	0	0	0	0	0	0	0	0	0	0	0	0

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
267	0	0	0	0	0	0	0	0	0	0	0	0
268	0	0	0	0	0	0	0	0	0	0	0	0
269	0	0	0	0	0	0	0	0	0	0	0	0
270	0	0	0	0	0	0	0	0	0	0	0	0
271	0	0	0	0	0	0	0	0	0	0	0	0
272	0	0	0	0	0	0	0	0	0	0	0	0
273	0	0	0	0	0	0	0	0	0	0	0	0
274	0	0	0	0	0	0	0	0	0	0	0	0
275	0	0	0	0	0	0	0	0	0	0	0	0
276	0	0	0	0	0	0	0	0	0	0	0	0
277	0	0	0	0	0	0	0	0	0	0	0	0
278	0	0	0	0	0	0	0	0	0	0	0	0
279	0	0	0	0	0	0	0	0	0	0	0	0
280	0	0	0	0	0	0	0	0	0	0	0	0
281	0	0	0	0	0	0	0	0	0	0	0	0
282	0	0	0	0	0	0	0	0	0	0	0	0
283	1	0	0	0	0	0	0	0	0	0	1	2
284	1	0	0	0	0	0	0	0	0	0	0	1
285	0	0	0	0	0	0	0	0	0	2	0	2
286	0	0	0	0	0	0	0	0	1	0	0	1
287	1	0	0	0	0	0	0	0	0	0	0	1
288	0	0	0	0	0	0	0	0	0	0	0	0
289	2	0	0	0	0	0	0	0	0	0	0	2
290	0	0	0	0	0	0	0	0	0	0	0	0
291	0	0	0	0	0	0	0	0	0	0	0	0
292	1	0	0	0	0	0	0	0	0	0	0	1
293	0	0	0	0	0	0	0	0	0	0	0	0
294	0	0	0	0	0	0	0	0	0	0	0	0
295	1	0	0	0	0	0	0	0	0	0	0	1
296	2	0	0	0	0	0	0	0	0	0	0	2
297	3	0	0	0	0	0	0	0	0	0	0	3
298	0	0	0	0	0	0	0	0	0	0	0	0
299	0	0	0	0	0	0	0	0	0	0	0	0
300	1	0	0	0	0	0	0	0	0	0	0	1
301	0	0	0	0	0	0	0	0	0	0	0	0
302	1	0	0	0	0	0	0	0	0	0	0	1
303	2	0	0	0	0	0	0	0	0	0	0	2
304	0	0	0	0	0	0	0	0	0	0	0	0
305	2	0	0	0	0	0	0	0	0	0	0	2
306	1	0	0	0	0	0	0	0	0	0	0	1
307	0	0	0	0	0	0	0	0	0	0	0	0
308	2	0	0	0	0	0	0	0	0	0	0	2
309	2	0	0	0	0	0	0	0	0	0	0	2
310	2	0	0	0	0	0	0	0	0	0	0	2
311	3	0	0	0	0	0	0	0	0	0	0	3

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
312	0	0	0	0	0	0	0	0	0	0	0	0
313	0	0	0	0	0	0	0	0	0	0	0	0
314	0	0	0	0	0	0	0	0	0	0	0	0
315	1	0	0	0	0	0	0	0	0	0	0	1
316	1	0	0	0	0	0	0	0	0	0	0	1
317	4	0	0	0	0	0	0	0	0	0	0	4
318	1	0	0	0	0	0	0	0	0	0	0	1
319	2	0	0	0	0	0	0	0	0	0	0	2
320	0	0	0	1	0	0	0	0	0	0	0	1
321	2	0	0	0	0	0	0	0	0	0	0	2
322	1	0	0	0	0	0	0	0	0	0	0	1
323	0	0	0	0	0	0	0	0	0	0	0	0
324	2	0	0	0	0	0	0	0	0	0	0	2
325	1	0	0	0	0	0	0	0	0	0	0	1
326	0	0	0	0	0	0	0	0	0	0	0	0
327	2	0	0	0	0	0	0	0	0	0	0	2
328	0	0	0	0	0	0	0	0	0	0	0	0
329	1	0	0	0	0	0	0	0	0	0	0	1
330	1	0	0	0	0	0	0	0	0	0	0	1
331	0	0	0	0	0	0	0	0	0	0	0	0
332	0	0	0	0	0	0	0	0	0	0	0	0
333	1	0	0	0	0	0	0	0	0	3	0	4
334	0	0	0	0	0	0	0	0	0	0	0	0
335	0	0	0	0	0	0	0	0	0	0	0	0
336	2	0	0	0	0	0	0	0	0	0	0	2
337	0	0	0	0	0	0	0	0	0	0	0	0
338	0	0	0	0	0	0	0	0	0	1	0	1
339	0	0	0	0	0	1	0	0	0	0	0	1
340	0	0	0	0	0	0	0	0	0	0	0	0
341	2	0	0	0	0	0	0	0	0	0	0	2
342	0	0	0	0	0	0	0	0	0	0	0	0
343	1	0	0	0	0	0	0	0	0	0	0	1
344	0	0	0	0	0	0	0	0	0	0	0	0
345	0	0	0	0	0	1	0	0	0	0	0	1
346	0	0	0	0	0	0	0	0	0	0	0	0
347	0	0	0	0	0	0	0	0	0	0	0	0
348	2	0	0	0	0	0	0	0	0	0	0	2
349	0	0	0	0	0	0	0	0	0	0	0	0
350	0	0	0	0	0	0	0	0	0	0	0	0
351	1	0	0	0	0	0	0	0	0	0	0	1
352	0	0	0	0	0	0	0	0	0	0	0	0
353	2	0	0	0	0	0	0	0	0	0	0	2
354	2	0	0	0	0	0	0	0	0	0	0	2
355	1	0	0	0	0	0	0	0	0	0	0	1
356	0	0	0	0	0	0	0	1	0	0	0	1

ST Number	Quartz Tertiary Flake	Quartz Core	Quartz Biface	Quartz PPK	Crystal Quartz Tertiary Flake	CP Chert Tertiary Flake	CP Chert Core	RV Chert Tertiary Flake	Piedmont Chert Flake	Diabase Tertiary Flake	Metadacite Flake	Total
357	0	0	0	0	0	0	0	0	0	0	0	0
358	3	0	0	0	0	0	0	0	0	0	0	3
359	1	0	0	0	0	1	0	0	0	0	0	2
360	0	0	0	0	0	0	0	0	0	0	0	0
361	2	0	0	0	0	0	0	0	0	0	0	2
362	0	0	0	0	0	0	0	0	0	0	0	0
363	0	0	0	0	0	0	0	0	0	0	0	0
364	0	0	0	0	0	0	0	0	0	0	0	0
365	0	0	0	0	0	0	0	0	0	0	0	0
366	0	0	0	0	0	0	0	0	0	0	0	0
367	0	0	0	0	0	0	0	0	0	0	0	0
368	0	0	0	0	0	0	0	0	0	0	0	0
369	3	0	0	0	0	0	0	0	0	0	0	3
370	0	0	0	0	0	0	0	0	0	0	0	0
371	1	0	0	0	0	0	0	0	0	0	0	1
372	1	0	0	0	0	0	0	0	0	0	0	1
373	0	0	0	0	0	0	0	0	0	0	0	0
374	0	0	0	0	0	0	0	0	0	0	0	0
375	0	0	0	0	0	0	0	0	0	0	0	0
376	0	0	0	0	0	0	0	0	0	0	0	0
377	0	0	0	0	0	0	0	0	0	0	0	0
378	0	0	0	0	0	0	0	0	0	0	0	0
379	0	0	0	0	0	0	0	0	0	0	0	0
380	0	0	0	0	0	0	0	0	0	0	0	0
381	0	0	0	0	0	0	0	0	0	0	0	0
382	0	0	0	0	0	0	0	0	0	0	0	0
383	0	0	0	0	0	0	0	0	0	0	0	0
Totals	229	9	2	2	4	12	1	5	1	11	5	281

Appendix 3
Shovel Test Miscellaneous

N = Number

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
	N	Grams	N	N	N	Red	White	Total
1	0	0.0	0	0	0	0	0	0
2	0	0.0	2	0	0	0	2	2
3	0	0.0	0	0	0	0	0	0
4	0	0.0	2	0	0	0	0	0
5	0	0.0	0	0	0	1	3	4
6	0	0.0	0	0	0	1	0	1
7	0	0.0	0	0	0	0	0	0
8	0	0.0	0	0	0	0	4	4
9	0	0.0	5	0	0	0	0	0
10	0	0.0	0	0	0	2	0	2
11	0	0.0	0	0	0	0	0	0
12	0	0.0	0	0	0	0	0	0
13	0	0.0	0	0	0	0	0	0
14	0	0.0	0	0	0	0	0	0
15	0	0.0	2	0	0	0	2	2
16	0	0.0	0	0	0	0	0	0
17	0	0.0	0	0	0	0	0	0
18	0	0.0	2	0	0	0	0	0
19	0	0.0	0	0	0	1	0	1
20	0	0.0	2	0	0	0	0	0
21	0	0.0	7	0	0	0	0	0
22	0	0.0	0	0	0	0	0	0
23	0	0.0	1	0	0	0	2	2
24	0	0.0	0	0	0	0	0	0
25	2	3.0	0	0	0	0	0	0
26	0	0.0	0	0	0	0	0	0
27	0	0.0	0	0	0	0	2	2
28	1	1.0	0	0	0	0	0	0
29	0	0.0	0	0	0	2	0	2
30	0	0.0	0	0	0	0	0	0
31	0	0.0	0	0	0	0	0	0
32	0	0.0	0	0	0	0	0	0
33	0	0.0	0	0	0	1	2	3
34	0	0.0	0	0	0	0	0	0
35	0	0.0	0	0	0	0	1	1
36	1	0.5	0	0	0	1	2	3
37	0	0.0	0	0	0	0	0	0
38	0	0.0	0	0	0	0	0	0
39	0	0.0	0	0	0	0	0	0
40	0	0.0	0	0	0	1	1	2
41	0	0.0	0	0	0	0	0	0

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
42	0	0.0	0	0	0	0	0	0
43	0	0.0	0	0	0	0	0	0
44	0	0.0	0	0	0	0	2	2
45	0	0.0	0	0	0	0	0	0
46	0	0.0	0	0	0	0	0	0
47	0	0.0	0	0	0	1	3	4
48	0	0.0	0	0	0	0	0	0
49	0	0.0	0	0	0	0	0	0
50	0	0.0	0	0	0	0	0	0
51	0	0.0	0	0	0	0	0	0
52	0	0.0	0	0	0	1	0	1
53	0	0.0	0	0	0	1	0	1
54	0	0.0	0	0	0	0	0	0
55	0	0.0	0	0	0	0	5	5
56	0	0.0	0	0	0	0	0	0
57	1	0.5	0	0	0	2	3	5
58	0	0.0	0	0	0	0	0	0
59	0	0.0	0	0	0	0	0	0
60	0	0.0	0	0	0	0	1	1
61	0	0.0	14	0	0	1	4	5
62	0	0.0	0	0	0	0	2	2
63	0	0.0	0	0	0	0	3	3
64	0	0.0	0	0	0	0	3	3
65	0	0.0	0	0	0	0	2	2
66	0	0.0	2	0	0	0	2	2
67	0	0.0	0	0	0	2	2	4
68	0	0.0	0	0	0	0	0	0
69	0	0.0	2	0	0	2	1	3
70	0	0.0	0	0	0	2	0	2
71	0	0.0	0	0	0	0	1	1
72	0	0.0	0	0	0	0	3	3
73	0	0.0	0	0	0	0	0	0
74	0	0.0	0	0	0	0	0	0
75	0	0.0	0	0	0	2	6	8
76	0	0.0	0	0	0	0	1	1
77	0	0.0	0	0	0	0	1	1
78	0	0.0	0	0	0	0	3	3
79	0	0.0	2	0	0	0	3	3
80	0	0.0	0	0	0	0	2	2
81	0	0.0	0	0	0	1	1	2
82	0	0.0	0	0	0	0	8	8
83	0	0.0	0	0	0	0	0	0
84	0	0.0	0	0	0	0	1	1
85	0	0.0	0	0	0	0	1	1
86	0	0.0	0	0	0	0	0	0
87	0	0.0	0	0	0	1	1	2

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
88	0	0.0	0	0	0	0	0	0
89	0	0.0	0	0	0	1	0	1
90	0	0.0	0	0	0	0	0	0
91	0	0.0	0	0	0	1	1	2
92	0	0.0	0	0	0	1	0	1
93	0	0.0	0	0	0	1	0	1
94	0	0.0	0	0	0	1	4	5
95	0	0.0	0	0	0	0	0	0
96	0	0.0	0	0	0	0	0	0
97	0	0.0	2	0	0	0	4	4
98	0	0.0	0	0	0	1	4	5
99	0	0.0	30	0	0	3	7	10
100	0	0.0	0	0	0	0	1	1
101	0	0.0	0	0	0	0	3	3
102	0	0.0	0	0	0	0	3	3
103	0	0.0	6	0	0	0	2	2
104	0	0.0	0	0	0	0	2	2
105	0	0.0	0	0	0	0	2	2
106	0	0.0	0	0	0	0	3	3
107	0	0.0	0	0	0	0	1	1
108	1	0.5	0	0	0	0	1	1
109	0	0.0	0	1	1	1	3	4
110	1	1.0	1	0	0	2	3	5
111	0	0.0	0	0	0	2	2	4
112	0	0.0	0	0	0	0	3	3
113	0	0.0	0	0	0	2	0	2
114	0	0.0	0	0	0	0	0	0
115	0	0.0	0	0	0	0	1	1
116	0	0.0	0	0	0	2	1	3
117	0	0.0	0	0	0	0	0	0
118	0	0.0	0	0	0	0	1	1
119	0	0.0	0	0	0	0	3	3
120	0	0.0	0	0	0	1	4	5
121	0	0.0	0	0	0	0	0	0
122	0	0.0	1	0	0	0	2	2
123	0	0.0	0	0	0	0	2	2
124	0	0.0	0	0	0	0	4	4
125	0	0.0	0	0	0	2	3	5
126	0	0.0	0	0	0	2	3	5
127	0	0.0	0	0	0	0	3	3
128	0	0.0	0	0	0	0	4	4
129	0	0.0	0	0	0	1	3	4
130	0	0.0	0	0	0	0	1	1
131	0	0.0	0	0	0	0	2	2
132	0	0.0	0	0	0	1	1	2
133	0	0.0	5	0	0	0	3	3

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
134	0	0.0	0	0	0	1	0	1
135	0	0.0	0	0	0	0	1	1
136	0	0.0	0	0	0	0	1	1
137	0	0.0	0	0	0	0	0	0
138	0	0.0	0	0	0	0	1	1
139	0	0.0	0	0	0	0	6	6
140	0	0.0	4	0	0	0	0	0
141	0	0.0	0	0	0	0	1	1
142	0	0.0	0	0	0	0	3	3
143	2	0.5	0	0	0	2	1	3
144	0	0.0	0	0	0	0	2	2
145	0	0.0	0	0	0	0	10	10
146	0	0.0	0	0	0	0	1	1
147	0	0.0	0	0	0	0	5	5
148	0	0.0	0	0	0	0	0	0
149	0	0.0	0	0	0	0	3	3
150	0	0.0	0	0	0	0	1	1
151	0	0.0	0	0	0	0	1	1
152	0	0.0	0	0	0	4	2	6
153	0	0.0	0	0	0	1	4	5
154	0	0.0	0	0	0	1	2	3
155	0	0.0	0	0	0	0	1	1
156	0	0.0	0	0	0	0	6	6
157	0	0.0	0	0	0	2	5	7
158	0	0.0	0	0	0	0	2	2
159	0	0.0	0	0	0	0	0	0
160	0	0.0	0	0	0	0	0	0
161	0	0.0	0	0	0	0	2	2
162	0	0.0	0	0	0	0	2	2
163	0	0.0	0	0	0	0	4	4
164	0	0.0	0	0	0	0	0	0
165	0	0.0	0	0	0	1	2	3
166	0	0.0	0	0	0	0	1	1
167	0	0.0	0	0	0	0	5	5
168	0	0.0	0	0	0	0	0	0
169	0	0.0	0	0	0	0	0	0
170	0	0.0	0	0	0	2	0	2
171	0	0.0	0	0	0	1	3	4
172	0	0.0	0	0	0	1	1	2
173	0	0.0	0	0	0	0	3	3
174	0	0.0	0	0	0	0	0	0
175	0	0.0	0	0	0	1	1	2
176	0	0.0	0	0	0	0	1	1
177	0	0.0	0	0	0	0	0	0
178	0	0.0	0	0	0	0	1	1
179	0	0.0	0	0	0	0	0	0

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
180	0	0.0	0	0	0	1	3	4
181	0	0.0	0	0	0	0	2	2
182	0	0.0	5	0	0	0	2	2
183	0	0.0	6	0	0	1	4	5
184	0	0.0	8	0	0	1	2	3
185	0	0.0	21	0	0	0	8	8
186	0	0.0	0	0	0	1	10	11
187	0	0.0	0	0	0	0	1	1
188	0	0.0	0	0	0	2	0	2
189	0	0.0	0	0	0	0	0	0
190	0	0.0	5	0	0	2	3	5
191	0	0.0	8	0	0	0	6	6
192	2	1.0	3	0	0	0	3	3
193	0	0.0	0	0	0	1	3	4
194	0	0.0	5	0	0	1	4	5
195	0	0.0	2	0	0	1	4	5
196	0	0.0	1	0	0	2	2	4
197	0	0.0	1	0	0	1	0	1
198	0	0.0	0	0	0	0	2	2
199	1	0.5	2	0	0	0	10	10
200	1	0.5	1	0	0	0	1	1
201	0	0.0	0	0	0	0	0	0
202	0	0.0	0	0	0	0	0	0
203	0	0.0	4	0	0	1	1	2
204	0	0.0	0	0	0	0	4	4
205	0	0.0	1	0	0	0	2	2
206	0	0.0	2	0	0	1	0	1
207	0	0.0	2	0	0	0	6	6
208	0	0.0	2	0	0	0	3	3
209	0	0.0	0	0	0	0	0	0
210	1	0.5	3	0	0	2	4	6
211	0	0.0	5	0	0	0	4	4
212	0	0.0	1	0	0	0	5	5
213	0	0.0	1	0	0	0	1	1
214	0	0.0	2	0	0	0	2	2
215	1	0.5	0	0	0	0	3	3
216	0	0.0	3	0	0	0	1	1
217	0	0.0	0	0	0	1	3	4
218	0	0.0	0	0	0	0	3	3
219	0	0.0	15	0	0	2	2	4
220	0	0.0	7	0	0	3	5	8
221	0	0.0	3	0	0	0	4	4
222	0	0.0	11	0	0	0	9	9
223	0	0.0	12	0	0	0	2	2
224	0	0.0	0	0	0	1	3	4
225	0	0.0	0	0	0	0	0	0

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
226	0	0.0	0	0	0	1	2	3
227	1	0.5	0	0	0	2	3	5
228	0	0.0	0	0	0	0	0	0
229	0	0.0	0	0	0	0	3	3
230	0	0.0	10	0	0	2	3	5
231	0	0.0	7	0	0	1	7	8
232	0	0.0	0	0	0	0	2	2
233	0	0.0	0	0	0	1	0	1
234	0	0.0	0	0	0	0	1	1
235	0	0.0	1	0	0	0	0	0
236	0	0.0	0	0	0	1	1	2
237	0	0.0	0	0	0	1	2	3
238	0	0.0	0	0	0	2	0	2
239	0	0.0	0	0	0	0	0	0
240	0	0.0	1	0	0	0	0	0
241	0	0.0	0	0	0	0	1	1
242	0	0.0	0	0	0	0	0	0
243	0	0.0	0	0	0	1	3	4
244	0	0.0	0	0	0	1	1	2
245	0	0.0	9	0	0	0	4	4
246	0	0.0	0	0	0	0	0	0
247	0	0.0	6	0	0	2	3	5
248	0	0.0	2	0	0	0	3	3
249	0	0.0	0	0	0	0	2	2
250	0	0.0	10	0	0	0	4	4
251	1	0.5	7	0	0	0	4	4
252	0	0.0	0	0	0	0	3	3
253	0	0.0	0	0	0	0	2	2
254	0	0.0	3	0	0	1	1	2
255	0	0.0	3	0	0	0	3	3
256	0	0.0	11	0	0	0	0	0
257	0	0.0	0	0	0	1	2	3
258	0	0.0	1	0	0	0	2	2
259	0	0.0	1	0	0	0	4	4
260	0	0.0	2	0	0	0	2	2
261	0	0.0	6	0	0	2	1	3
262	0	0.0	7	0	0	0	0	0
263	0	0.0	2	0	0	0	2	2
264	0	0.0	3	0	0	0	0	0
265	0	0.0	9	0	0	0	0	0
266	0	0.0	6	0	0	0	0	0
267	0	0.0	1	0	0	1	0	1
268	0	0.0	0	0	0	0	3	3
269	0	0.0	5	0	0	0	0	0
270	0	0.0	5	0	0	0	2	2
271	0	0.0	4	0	0	2	3	5

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
272	0	0.0	4	0	0	0	0	0
273	0	0.0	2	0	0	2	0	2
274	0	0.0	1	0	0	0	3	3
275	0	0.0	3	0	0	0	0	0
276	0	0.0	0	0	0	1	3	4
277	0	0.0	0	0	0	0	3	3
278	0	0.0	0	0	0	1	1	2
279	0	0.0	0	0	0	1	2	3
280	0	0.0	0	0	0	2	0	2
281	0	0.0	4	0	0	1	0	1
282	0	0.0	2	0	0	0	2	2
283	0	0.0	6	0	0	0	3	3
284	0	0.0	4	0	0	0	0	0
285	0	0.0	6	0	0	0	0	0
286	0	0.0	3	0	0	0	2	2
287	0	0.0	0	0	0	1	1	2
288	0	0.0	22	0	0	0	3	3
289	0	0.0	11	0	0	0	4	4
290	0	0.0	2	0	0	1	1	2
291	0	0.0	0	0	0	0	0	0
292	1	1.0	0	0	0	0	0	0
293	0	0.0	3	0	0	0	0	0
294	0	0.0	3	0	0	0	0	0
295	0	0.0	2	0	0	0	0	0
296	0	0.0	13	0	0	0	1	1
297	0	0.0	19	0	0	1	7	8
298	0	0.0	3	0	0	0	0	0
299	0	0.0	3	0	0	1	4	5
300	0	0.0	1	0	0	0	0	0
301	0	0.0	1	0	0	0	0	0
302	0	0.0	15	0	0	0	0	0
303	0	0.0	45	0	0	2	1	3
304	0	0.0	1	0	0	0	0	0
305	0	0.0	2	0	0	0	0	0
306	0	0.0	0	0	0	1	0	1
307	0	0.0	10	0	0	0	0	0
308	0	0.0	9	0	0	1	1	2
309	0	0.0	8	0	0	0	0	0
310	0	0.0	4	0	0	0	0	0
311	0	0.0	8	0	0	0	0	0
312	0	0.0	5	0	0	1	5	6
313	0	0.0	34	0	0	2	5	7
314	0	0.0	2	0	0	0	1	1
315	0	0.0	20	0	0	0	1	1
316	0	0.0	8	0	0	0	0	0
317	0	0.0	2	0	0	0	0	0

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
318	0	0.0	5	0	0	0	0	0
319	0	0.0	0	0	0	0	1	1
320	0	0.0	32	0	0	0	5	5
321	2	1.0	34	0	0	0	4	4
322	1	2.0	26	0	0	0	0	0
323	0	0.0	3	0	0	0	0	0
324	0	0.0	0	0	0	0	0	0
325	0	0.0	23	0	0	2	2	4
326	0	0.0	28	0	0	0	1	1
327	0	0.0	0	0	0	0	0	0
328	0	0.0	1	0	0	0	0	0
329	0	0.0	1	0	0	0	0	0
330	0	0.0	21	0	0	0	0	0
331	0	0.0	10	0	0	0	1	1
332	0	0.0	0	0	0	1	1	2
333	0	0.0	0	0	0	0	1	1
334	0	0.0	0	0	0	0	0	0
335	0	0.0	0	0	0	1	1	2
336	0	0.0	0	0	0	0	0	0
337	0	0.0	0	0	0	0	1	1
338	0	0.0	0	0	0	3	6	9
339	0	0.0	0	0	0	0	0	0
340	0	0.0	0	0	0	0	0	0
341	0	0.0	0	0	0	0	0	0
342	0	0.0	0	0	0	0	1	1
343	0	0.0	0	0	0	0	3	3
344	0	0.0	0	0	0	0	0	0
345	0	0.0	0	0	0	0	0	0
346	0	0.0	0	0	0	0	2	2
347	0	0.0	0	0	0	0	1	1
348	0	0.0	0	0	0	1	1	2
349	0	0.0	0	0	0	0	0	0
350	0	0.0	0	0	0	0	0	0
351	0	0.0	0	0	0	2	1	3
352	0	0.0	0	0	0	0	0	0
353	0	0.0	0	0	0	0	0	0
354	0	0.0	0	0	0	2	6	8
355	0	0.0	0	0	0	0	1	1
356	0	0.0	0	0	0	0	2	2
357	0	0.0	0	0	0	0	3	3
358	0	0.0	0	0	0	0	5	5
359	0	0.0	0	0	0	0	2	2
360	0	0.0	0	0	0	0	0	0
361	0	0.0	0	0	0	0	8	8
362	0	0.0	0	0	0	0	2	2
363	0	0.0	0	0	0	0	0	0

ST Number	Hematite		Daub	Plain Pearl Ware	Blue Feather Edge Pearl Ware	River Pebbles		
364	0	0.0	0	0	0	0	0	0
365	0	0.0	0	0	0	0	1	1
366	0	0.0	0	0	0	1	9	10
367	0	0.0	0	0	0	0	3	3
368	0	0.0	0	0	0	0	6	6
369	0	0.0	0	0	0	0	4	4
370	0	0.0	0	0	0	0	0	0
371	0	0.0	0	0	0	0	0	0
372	0	0.0	0	0	0	0	2	2
373	0	0.0	0	0	0	0	0	0
374	0	0.0	0	0	0	0	2	2
375	0	0.0	0	0	0	0	0	0
376	0	0.0	0	0	0	0	0	0
377	0	0.0	0	0	0	0	3	3
378	0	0.0	0	0	0	0	2	2
379	0	0.0	0	0	0	0	0	0
380	0	0.0	0	0	0	0	0	0
381	0	0.0	0	0	0	0	2	2
382	0	0.0	0	0	0	1	5	6
383	0	0.0	0	0	0	0	1	1
Totals	21	15.0	831	1	1	148	633	781

Appendix 4
Phosphate Data

Number	North	East	Phosphate
1	480	470	1.89
2	480	480	1.82
3	480	490	2.43
4	480	500	1.06
5	480	510	2.75
6	490	450	1.47
7	490	460	2.06
8	490	470	1.61
9	490	480	1.47
10	490	490	2.22
11	490	500	2.95
12	490	510	2.89
13	500	450	2.39
14	500	460	1.07
15	500	460	0.91
16	500	470	0.86
17	500	480	1.05
18	500	490	1.79
19	500	500	2.78
20	500	510	2.99
21	500	520	1.24
22	510	450	2.30
23	510	460	2.78
24	510	460	1.42
25	510	470	1.80
26	510	480	0.75
27	510	490	1.52
28	510	500	2.11
29	510	510	1.49
30	510	520	1.81
31	520	450	1.95
32	520	460	1.75
33	520	470	1.40
34	520	480	1.47
35	520	490	1.14
36	520	500	2.32
37	520	510	2.98
38	530	500	2.68
39	540	500	2.65

Appendix 5
Post Mold Basic Data

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
1	499.34	482.48	28	35	2	
2	498.15	481.99	32	13	2	
3	498.40	481.77	28	8	2	
4	499.50	481.73	23	7	2	
5	499.52	481.49	19	8	2	
6	498.68	481.40	30	14	2	
7	499.93	481.41	23	14	2	
8	498.96	481.04	33	45	2	
9	498.94	479.82	23	44	2	
10	499.21	479.73	24	10	2	
11	499.70	479.46	24	22	2	
12	499.91	479.38	23	26	2	
13	499.03	479.00	23	9	2	
14	498.65	479.01	19	5	2	
15	499.37	478.80	26	9	2	
16	499.81	478.87	25	9	2	
17	499.60	478.66	25	16	2	
18	499.68	478.42	24	17	2	
19	499.80	478.09	30	19	2	
20	499.44	477.82	27	30	2	
21	499.61	477.60	26	46	2	
22	498.96	477.18	22	15	2	
23	498.33	476.68	23	8	2	
24	498.09	476.37	22	11	2	
25	497.52	475.70	24	18	2	
26	496.77	476.13	29	31	2	
27	496.75	476.48	23	21	2	
28	496.40	475.73	14	11	2	
29	496.03	475.58	15	8	2	
30	496.08	476.67	25	21	2	
31	495.87	476.41	21	22	2	
32	495.68	476.70	26	20	2	
33	495.61	475.72	24	18	2	
34	495.69	475.35	23	31	2	
35	495.67	475.05	21	23	2	
36	495.21	475.94	31	40	2	
37	494.57	475.29	19	22	2	
38	493.78	476.35	21	24	2	
39	493.74	476.58	21	13	2	
40	493.57	476.21	29	13	2	
41	493.52	476.68	23	10	2	
42	493.59	475.46	22	11	2	
43	493.44	475.17	18	10	2	
44	493.02	475.77	20	18	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
45	492.38	475.98	7	5	2	
46	492.53	476.65	26	20	2	
47	492.22	476.23	19	22	2	
48	490.98	476.45	34	40	2	
49	490.78	476.73	18	19	2	
50	489.28	475.89	20	23	2	
51	489.36	476.31	15	25	2	
52	489.13	475.11	24	28	2	
53	488.77	475.17	16	20	2	
54	488.65	476.75	22	14	2	
55	499.34	472.62	32	92	2	
56	499.59	472.11	33	82	2	
57	499.64	471.85	31	19	2	
58	498.17	472.06	13	18	2	
59	498.28	471.89	23	75	2	
60	499.97	471.36	17	15	2	
61	499.53	470.72	16	15	2	
62	498.68	470.85	17	10	2	
63	498.32	470.64	13	13	2	
64	498.80	469.65	10	23	2	
65	499.67	469.27	15	8	2	
66	498.50	468.35	18	19	2	
67	498.49	468.14	16	50	2	
68	499.42	468.15	18	9	2	
69	499.70	468.01	12	4	2	
70	499.66	466.60	23	77	2	
71	498.07	483.68	27	31	2	
72	498.94	482.23	28	45	2	
73	499.51	482.36	36	80	2	
74	499.51	482.13	9	4	2	
75	498.47	481.34	30	16	2	
76	499.64	480.77	28	82	2	
77	499.65	480.97	16	69	2	
78	499.91	481.06	25	18	2	
79	498.46	480.31	16	7	2	
80	498.47	479.89	30	19	2	
81	498.69	479.95	21	7	2	
82	498.89	479.28	26	21	2	
83	498.68	479.32	29	10	2	
84	498.16	479.03	34	63	2	
85	499.05	478.69	24	43	2	
86	498.50	478.75	19	12	2	
87	498.58	478.47	25	61	2	
88	498.25	478.41	22	32	2	
89	498.41	478.20	41	61	2	
90	498.50	477.96	21	11	2	
91	498.51	477.46	17	8	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
92	498.13	477.64	43	23	2	
93	499.16	476.04	27	15	2	
94	499.51	475.53	16	14	2	
95	494.96	476.52	31	15	2	
96	494.84	476.21	16	18	2	
97	494.75	476.44	23	20	2	
98	498.20	476.84	17	11	2	
99	498.93	475.34	18	16	2	
100	496.72	475.33	34	16	2	
101	518.16	485.15	18	25	1	
102	517.43	480.36	24	39	1	
103	517.15	482.45	23	43	1	
104	518.26	482.12	24	24	1	
105	518.75	482.01	19	20	1	
106	518.54	480.30	15	22	1	
107	517.42	488.33	20	24	1	
108	517.54	489.01	18	23	1	
109	517.17	487.19	23	15	1	
110	500.15	476.68	21	11	2	
111	502.58	476.66	25	23	2	
112	502.74	476.72	17	40	2	
113	503.19	476.08	16	13	2	
114	503.72	476.31	24	82	2	Probable Tree
115	504.25	475.26	22	16	2	
116	505.61	476.22	23	90	2	Probable Tree
117	505.88	476.47	20	6	2	
118	507.78	475.38	13	6	2	
119	507.65	475.75	20	17	2	
120	507.56	476.03	13	7	2	
121	507.24	476.16	30	23	2	
122	508.25	476.33	21	17	2	
123	508.25	476.45	9	5	2	
124	508.05	476.41	12	7	2	Probably not a post
125	503.64	475.36	23	33	2	
126	503.66	475.16	29	19	2	
127	502.55	475.36	13	7	2	
128	502.98	475.16	21	53	2	
129	508.96	476.40	26	19	2	
130	497.57	476.83	26	22	2	
131	497.64	477.67	25	16	2	
132	497.70	477.40	7	7	2	
133	497.85	477.36	18	11	2	
134	497.77	478.18	19	12	2	
135	497.53	478.17	14	11	2	
136	497.29	477.80	22	23	2	
137	497.25	477.23	20	29	2	
138	496.85	477.52	23	26	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
139	495.83	477.43	25	19	2	
140	494.46	476.88	15	11	2	
141	494.07	476.91	12	13	2	
142	493.92	477.06	23	19	2	
143	493.33	477.60	28	6	2	
144	493.08	477.55	22	9	2	
145	493.18	477.77	26	10	2	
146	493.45	478.06	20	9	2	
147	493.06	478.34	19	10	2	
148	493.78	478.37	34	15	2	
149	494.30	478.85	22	23	2	
150	494.55	478.47	24	20	2	
151	494.60	478.71	22	11	2	
152	495.20	478.43	27	13	2	
153	494.72	479.04	19	9	2	
154	495.56	478.87	18	8	2	
155	494.77	479.64	25	10	2	
156	493.86	478.87	29	28	2	
157	493.39	478.77	22	11	2	
158	494.84	477.30	27	79	2	Possible tap root?
159	495.28	477.43	30	22	2	
160	495.10	477.71	30	69	2	
161	495.33	477.76	40	6	2	
162	495.52	477.97	30	14	2	
163	495.64	477.82	22	13	2	
164	495.93	477.73	59	70	2	
165	496.15	477.54	45	95	2	
166	497.85	479.65	27	54	2	
167	498.05	479.10	20	20	2	
168	497.73	479.03	20	5	2	
169	497.18	479.05	21	5	2	
170	493.20	479.55	35	115	2	Tree?
171	493.65	479.36	17	15	2	
172	496.83	478.85	22	27	2	
173	496.91	478.69	22	22	2	
174	496.40	478.54	39	77	2	
175	496.50	478.43	49	24	2	
176	496.76	478.24	37	23	2	
177	499.42	484.31	26	41	2	
178	499.70	483.33	33	111	2	Tree?
179	499.37	483.40	18	8	2	
180	499.14	483.17	22	45	2	
181	498.06	483.45	19	11	2	
182	499.03	482.83	22	13	2	
183	498.48	482.86	24	11	2	
184	498.32	482.78	15	8	2	
185	498.91	482.41	18	9	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
186	499.00	478.21	24	77	2	
187	499.27	477.72	23	13	2	
188	498.22	476.52	27	23	2	
189	501.10	475.25	22	14	2	
190	502.17	475.42	17	24	2	
191	499.04	469.95	37	25	2	
192	491.61	475.59	35	87	2	Probable tree
193	491.25	475.40	20	15	2	
194	490.02	475.30	18	6	2	Tree?
195	489.47	476.70	16	18	2	
196	495.83	478.76	16	7	2	
197	495.91	478.37	19	20	2	
198	495.34	477.93	18	16	2	
199	494.65	480.06	17	50	2	
200	494.72	480.59	18	11	2	
201	494.88	480.70	19	70	2	
202	494.90	481.05	19	17	2	in Feature 5
203	496.12	480.00	21	31	2	
204	495.79	480.14	30	48	2	
205	495.51	480.74	18	7	2	
206	495.76	481.09	38	15	2	
207	495.37	481.28	17	12	2	
208	495.66	481.48	20	26	2	
209	496.28	481.16	19	18	2	
210	496.22	481.58	28	10	2	
211	497.89	479.99	27	12	2	
212	497.70	480.01	26	20	2	
213	497.74	480.32	17	5	2	
214	497.54	480.47	15	10	2	
215	497.28	480.31	26	24	2	
216	497.63	480.79	20	8	2	
217	497.46	481.13	31	81	2	
218	497.72	481.24	26	14	2	
219	497.63	481.36	25	11	2	
220	497.04	481.60	25	31	2	
221	497.25	481.79	16	7	2	
222	497.26	482.06	13	3	2	
223	497.71	482.30	27	12	2	
224	497.60	483.82	20	15	2	
225	497.57	484.19	43	127	2	
226	496.75	482.72	17	8	2	
227	496.53	482.87	49	117	2	
228	496.65	484.80	31	82	2	Probable Tree
229	496.02	481.95	20	12	2	
230	495.92	482.83	21	14	2	
231	495.61	482.69	20	9	2	
232	495.34	483.10	29	78	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
233	494.26	482.26	29	15	2	
234	494.22	482.91	24	11	2	
235	494.06	483.36	19	7	2	
236	494.19	483.88	20	8	2	
237	494.16	480.54	44	23	2	
238	494.36	480.84	33	38	2	
239	493.98	480.79	19	4	2	
240	493.84	480.84	15	10	2	
241	493.59	480.89	15	17	2	
242	494.43	481.14	24	32	2	in Feature 5
243	494.27	481.51	20	13	2	in Feature 5
244	493.57	481.62	32	68	2	in Feature 5
245	501.05	478.64	17	45	2	
246	501.34	479.07	22	15	2	
247	501.53	479.34	31	96	2	
248	501.11	480.91	29	82	2	
249	501.31	481.27	15	11	2	
250	500.24	479.72	29	17	2	
251	500.92	481.76	29	98	2	
252	501.06	481.83	24	13	2	
253	501.57	482.93	18	16	2	
254	501.65	483.05	19	19	2	
255	494.95	484.11	20	24	2	
256	493.48	483.61	32	29	2	
257	495.95	484.07	14	13	2	
258	492.62	484.56	41	16	2	Possible Small Pit
259	492.47	483.96	20	5	2	
260	492.06	483.78	40	25	2	
261	491.75	483.87	22	27	2	
262	491.68	484.30	21	32	2	
263	493.10	483.34	26	23	2	
264	492.70	483.08	21	11	2	
265	492.47	482.29	17	10	2	
266	492.27	482.34	19	28	2	
267	492.93	481.83	20	7	2	
268	492.44	481.63	22	80	2	
269	491.86	481.76	29	26	2	
270	491.14	484.40	17	7	2	
271	491.79	483.12	35	32	2	
272	491.50	483.19	16	17	2	
273	491.57	482.40	58	90	2	Tree - Combined with 274
274	491.97	482.28	58	90	2	Tree - Combined with 273
275	491.79	481.15	32	13	2	
276	491.73	480.81	20	16	2	
277	493.07	480.92	23	11	2	
278	493.00	480.55	20	22	2	
279	492.77	480.57	21	10	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
280	492.79	480.25	17	8	2	
281	492.75	479.63	19	11	2	
282	492.79	479.26	17	5	2	
283	492.45	479.72	21	17	2	
284	492.13	480.29	19	21	2	
285	492.14	479.76	28	17	2	
286	491.74	479.61	11	10	2	
287	491.29	479.96	27	23	2	
288	491.04	479.89	16	16	2	
289	490.65	479.83	19	9	2	
290	490.49	479.85	14	25	2	
291	491.36	479.03			2	Not a post
292	491.63	478.18	24	14	2	
293	492.36	477.69	33	26	2	
294	492.20	476.89	18	7	2	
295	492.73	478.24	30	14	2	
296	492.73	477.90	24	9	2	
297	490.68	477.34	23	15	2	
298	490.64	477.14	13	9	2	
299	490.54	479.03	29	15	2	
300	491.04	476.83	24	36	2	
301	490.50	478.81	15	19	2	
302	490.37	478.82	12	4	2	
303	490.30	480.18	18	11	2	
304	490.49	480.71	26	37	2	
305	490.88	481.49	24	16	2	
306	492.05	477.73	15	7	2	
307	492.15	477.23	23	7	2	
308	491.32	474.26	17	22	2	
309	491.57	474.30	30	19	2	
310	492.00	474.86	20	22	2	
311	492.94	474.43	25	21	2	
312	493.24	474.57	25	20	2	
313	494.64	473.91	19	29	2	
314	496.86	473.40	45	54	2	
315	500.56	474.43	26	22	2	
316	500.59	474.24	20	7	2	
317	500.39	474.36	19	9	2	
318	500.26	474.23	24	18	2	
319	501.92	474.16	20	42	2	
320	490.39	474.58	17	16	2	
321	490.23	473.65	15	16	2	
322	494.02	475.71	38	69	2	
323	495.04	477.90	17	7	2	
324	494.60	479.01	20	11	2	
325	495.98	474.21	20	44	2	
326	496.38	474.02	28	42	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
327	496.52	474.45	21	23	2	
328	496.77	474.36	21	13	2	
329	498.34	475.01	23	47	2	
330	498.94	476.64	49	57	2	
331	498.61	476.79	26	20	2	
332	500.04	477.71	32	90	2	
333	498.14	478.37	31	57	2	
334	498.00	478.26	20	45	2	
335	498.66	479.44	23	15	2	
336	496.76	478.51	21	16	2	
337	495.81	479.85	21	20	2	
338	497.51	480.68	18	20	2	
339	499.72	482.09	18	17	2	
340	497.89	482.67	26	21	2	
341	496.91	486.32	14	9	2	
342	495.95	482.94	17	12	2	
343	496.47	484.29	30	23	2	
344	493.61	483.23	20	15	2	
345	493.23	482.90	24	12	2	
346	495.42	486.78	12	42	2	
347	493.08	486.72	17	7	2	
348	492.90	486.69	19	7	2	
349	493.07	485.24	22	8	2	
350	492.28	485.21	14	6	2	
351	491.63	485.30	23	7	2	
352	491.28	486.03	26	14	2	
353	491.10	486.29	26	15	2	
354	489.50	477.01	15	13	2	
355	489.63	477.06	16	18	2	
356	489.81	477.49	27	14	2	
357	490.06	477.91	15	25	2	
358	489.27	477.82	31	25	2	
359	490.05	478.22	13	20	2	
360	489.38	478.24	32	30	2	
361	489.44	478.72	20	20	2	
362	489.74	479.00	28	35	2	
363	488.53	477.38	14	28	2	
364	488.17	477.41	15	19	2	
365	488.31	477.87	26	12	2	
366	488.35	478.53	26	19	2	
367	489.78	480.79	23	17	2	
368	489.86	481.04	19	8	2	
369	489.39	482.23	23	17	2	
370	489.09	482.09	31	16	2	
371	489.28	484.12	15	38	2	
372	488.44	484.63	45	34	2	Probable small pit
373	503.40	484.89	15	14	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
374	502.87	484.77	14	8	2	
375	502.12	484.65	32	17	2	
376	502.92	483.88	22	27	2	
377	502.95	483.54	16	12	2	
378	503.14	483.06	14	8	2	
379	503.27	482.76	21	10	2	
380	503.09	482.48	19	8	2	
381	503.65	482.68	18	12	2	
382	503.46	481.69	19	10	2	
383	503.75	481.63	24	15	2	
384	503.37	480.50	39	100	2	Probable Tree
385	502.58	474.65	37	100	2	
386	503.14	474.59	19	66	2	
387	503.04	474.25	21	17	2	
388	502.48	473.97	22	32	2	
389	503.50	473.22	25	32	2	
390	504.01	482.91	28	36	2	
391	504.61	480.57	23	15	2	
392	504.66	479.81	25	21	2	
393	490.19	480.02	14	7	2	
394	490.02	480.10	16	8	2	
395	489.87	479.90	17	13	2	
396	489.38	479.73	41	90	2	Probable Tree
397	488.94	479.56	17	29	2	
398	489.07	479.38	19	21	2	
399	488.39	478.93	15	6	2	
400	483.55	484.28	19	9	4	
401	483.46	484.62	21	27	4	
402	483.81	484.78	30	94	4	
403	482.79	484.65	26	27	4	
404	483.37	485.25	30	31	4	
405	482.29	485.72	17	18	4	
406	478.51	474.17	21	30	3	
407	479.73	474.10	26	24	3	
408	478.86	475.74	14	19	3	
409	503.11	478.70	6	7	2	
410	503.37	478.72	17	11	2	
411	501.42	482.18	18	28	2	
412	501.76	482.48	16	24	2	
413	503.83	482.23	21	15	2	
414	482.75	483.32	33	21	2	Excavation Unit 4
415	504.84	480.66	26	11	2	
416	504.57	479.96	25	13	2	
417	503.53	479.91	22	11	2	
418	503.85	480.78	21	81	2	Probable Tree
419	503.20	480.95	26	15	2	
420	502.92	480.60	14	7	2	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
421	501.10	485.69	25	26	2	
422	500.35	487.50	32	15	2	
423	497.34	481.16	21	17	2	
424	494.61	482.67	23	19	2	
425	494.36	482.69	13	7	2	
426	493.01	479.80	22	10	2	
427	492.89	479.12	37	90	2	
428	488.56	481.04	17	12	2	
429	488.73	478.49	14	11	2	
430	488.61	478.42	18	11	2	
431	495.65	473.11	17	28	2	
432	495.84	474.07	16	11	2	
433	498.01	474.78	18	10	2	
434	500.07	476.62	21	42	2	
435	500.54	475.86	24	39	2	
436	501.14	475.16	22	31	2	
437	502.95	475.08	20	37	2	
438	502.56	473.53	24	40	2	
439	503.09	473.38	21	15	2	
440	502.19	477.25	17	24	2	
441	501.98	478.04	17	14	2	
442	503.85	472.91	21	47	2	
443	503.74	470.88	18	11	2	
444	503.54	470.77	21	17	2	
445	501.50	471.15	27	95	2	
446	500.40	471.52	14	37	2	
447	488.09	476.05	17	5	2	
448	489.15	483.39	18	19	2	
449	490.96	481.34	13	28	2	
450	493.63	476.52	22	29	2	
451	494.05	481.01	25	39	2	
452	499.93	485.40	24	45	2	
453	500.23	485.37	27	95	2	
454	499.86	486.51	35	78	2	
455	502.90	486.40	22	12	2	
456	496.38	490.31	17	29	5	
457	496.06	490.54	14	5	5	
458	496.55	490.67	21	22	5	
459	495.18	490.99	26	72	5	
460	496.29	494.24	15	13	5	
461	495.89	497.07	18	25	5	
462	495.72	500.02	46	18	5	
463	496.33	500.53	15	7	5	
464	495.36	502.31	15	5	5	
465	495.28	503.05	42	28	5	
466	495.99	503.37	21	14	5	
467	496.50	503.63	22	7	5	

Post Mold	North	East	Diameter	Depth	Excavation Unit	Notes
468	504.54	482.70	21	16	2	
469	504.71	482.74	22	28	2	
470	504.57	482.08	30	73	2	
471	500.38	482.49	49	93	2	
472	501.41	480.46	16	10	2	
473	501.51	479.59	17	16	2	
474	502.60	478.63	33	10	2	
475	502.50	478.44	29	10	2	
476	500.91	480.06	14	9	2	
477	496.81	486.09	14	20	2	
478	491.52	479.19	20	23	2	
479	489.36	474.86	15	20	2	
480	490.01	473.47	26	22	2	
481	489.57	477.86	23	18	2	
482	493.75	485.86	24	82	2	
483	495.19	477.21	18	35	2	
484	499.93	479.81	19	5	2	
485	500.27	476.75	22	35	2	
486	565.99	428.43	17	23	6	
487	565.94	428.90	17	13	6	
488	566.07	428.92	17	15	6	
489	566.43	429.04	19	3	6	
490	566.63	428.88	18	30	6	
491	567.01	428.28	13	19	6	
492	567.01	428.44	22	61	6	
493	567.06	428.75	27	21	6	
494	567.15	429.48	21	18	6	
495	566.78	429.60	22	10	6	
496	567.91	428.15	18	8	6	