SITE 7NC-J-228

This section discusses the excavation strategy employed at 7NC-J-228 during site evaluation (Phase II) and data recovery (Phase III), and presents findings and analyses associated with the pre-Contact American Indian presence at the site. Features and artifacts encountered during the field investigations are described here, as are special analyses—including the spatial distributions of major artifact classes. Geoarchaeological observations regarding site stratigraphy and the paleoenvironment are also presented.

Historical artifacts were encountered during site evaluation (Phase II) and data recovery (Phase III), although in small quantities. The historical component at 7NC-J-228 was determined not eligible for inclusion in the NRHP. Detailed analysis of the historical data from the site is presented in a separate section (Appendix C) of this report, in an arrangement resulting from consultation with DelDOT and DESHPO. In the absence of a separate evaluation report, a summary of the historical findings is also included in the Site Evaluation section of the report that follows, in order to support the NRHP eligibility recommendations made following the evaluation portion of the project.

3.6 Site Evaluation (Phase II): Field Strategy and Findings

3.6.1 Shovel Testing

In total, 98 STPs were excavated on a 5-meter interval grid across the terrace on which the site was identified. Of those, 53 contained prehistoric artifacts (n=171) and 20 contained historical artifacts (n=32). Spatial analyses of shovel test data were conducted to produce a preliminary map of artifact distributions across the site (Figure 6-1). Based on these analyses, prehistoric artifacts (primarily debitage and thermally altered stone) appeared to be concentrated in the northern portion of the site. Site boundaries were primarily determined topographically, using the tributary to the west, a steep-to-gradual slope toward Sandom Branch to the north, and wetlands to the south. A series of negative STPs documented by LBA delineated the site’s eastern extent. The boundaries thus drawn defined a site that was irregular in shape, measuring 70 m north-to-south and 55 m east-to-west, at its broadest points, with a total area calculated at approximately 2,600 m².

3.6.2 Test Units and Stratigraphy

Following analysis of shovel test data, twenty-nine 1-m² test units were excavated to evaluate stratigraphic integrity and artifact concentrations, and to locate subsurface cultural features (Figure 6-2). Test units were distributed across the site at 5-to-10-m intervals with exception of four contiguous units (N230/E445-448) excavated to investigate a possible basin feature, Feature 3, and eight contiguous units (N234-235/E449-451 and N233/E450-451) excavated to investigate a thermally altered stone cluster, Feature 1. Prehistoric artifacts were recovered from 27 test units (n=1,212). Historical artifacts were recovered from 18 test units (n=46).

The excavated test unit soil profiles revealed plowed and unplowed surfaces within 7NC-J-228. Relatively undisturbed soil profiles were recorded within the extreme northern portion of the site, north of the N230 gridline. Soil profiles in this area consisted of a thin organic topsoil; a loamy sediment disturbed by biological activity; and a leached and weathered soil;
all underlain by sand and gravels with occasional cobble-sized clasts. The test unit at N230/E445 typified this sequence:

**Test Unit N230/E445**

<table>
<thead>
<tr>
<th>Depth</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-12 cm</td>
<td>10YR3/2</td>
<td>loam/humus (Stratum A)</td>
</tr>
<tr>
<td>12-35 cm</td>
<td>10YR4/4</td>
<td>loamy sand (Stratum B)</td>
</tr>
<tr>
<td>35 cm+</td>
<td>10YR5/8</td>
<td>sandy loam with gravels (Stratum C)</td>
</tr>
</tbody>
</table>

Stratigraphy in the plowed portion of the site consisted of a loamy sand plow zone, an undisturbed leached and weathered soil, and a sandy clay loam subsoil with gravels at depths of 40-50 cm. The upper third of the plow zone (Stratum A) was redeveloped topsoil with a high organic content resulting in a dark soil color. Examination of aerial photos since 1927 suggested that the site area had been wooded for the majority of the 20th century, thus allowing for topsoil redevelopment. All of the historical artifacts recovered in site evaluation
(Phase II) test units were from the loamy plow zone layer, Stratum A. The test unit at N223/E457 typified stratigraphy in the plowed portion of the site:

**Test Unit N223/E447**

- 0-22 cm: 10YR4/2 loamy sand / humus (Stratum A)
- 22-44 cm: 10YR5/4 loamy sand (Stratum B)
- 44 cm+: 7.5YR5/8 sandy clay loam (Stratum C)

The eastern part of the site extended upslope. Erosion or historical modification had produced a truncated profile of plowed soils over older weathered sediments, as indicated by the test unit at N203/E480:

**Test Unit N202/480**

- 0-25 cm: 10YR4/4 loamy sand / humus (Stratum A)
- 25 cm+: 7.5YR5/8 sandy clay loam (Stratum B)
3.6.3 Features

Six features were identified at 7NC-J-228, including one thermally altered stone cluster and five basin features. Feature 1 was a large cluster of thermally altered stone that was partially exposed in the unit at N234/E450. While the full depth of the feature was not determined, the artifacts appeared to be situated in a shallow, surface manifestation similar to a roasting platform. The remaining features included a large basin, Feature 3, with sloping side walls, stratified fill, and numerous artifacts. Three additional units were placed in a trench configuration west-to-east across Feature 3 to obtain a cross section of the pit. These units detected the presence of two additional basin features in profile, designated Features 7 and 8. A fourth basin, Feature 9, was identified adjacent to the southeast edge of Feature 1. Feature 9 was not fully exposed, but appeared to be similar in size to Feature 7. The last feature, Feature 6, was a concentration of thermally altered stones in the southeast portion of the test unit at N189/E465. The feature was plow truncated, but a substantial portion remained intact, extending beyond the limits of the test unit. Features 1, 3, and 6 were sampled, while features 7, 8, and 9 were left in place pending data recovery investigations. No historical features were identified.

3.6.4 Artifacts

In total, 1,472 artifacts were recovered during evaluation testing (Phase II) of the site, as detailed in Table 6-1. A complete artifact inventory is included in Appendix D.

<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>prehistoric</td>
<td>1,384</td>
</tr>
<tr>
<td>historical</td>
<td>78</td>
</tr>
<tr>
<td>floral/faunal</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,472</strong></td>
</tr>
</tbody>
</table>

Prehistoric artifact types primarily consisted of lithic debitage and fire-cracked rock (Table 6-2). In addition, four projectile points and 16 other tools were recovered. The points consisted of a Teardrop and two stemmed points, forms that are generally characteristic of the latter part of the Late Archaic and the Early Woodland period. The fourth point was a distal fragment that could not be typed. There was evidence of secondary biface reduction at the site, in the form of a distinct gray/black chert that made up a significant percentage of the lithic debitage recovered. The flakes were of small-to-medium size and non-cortical, suggesting that partially finished or finished bifaces were brought to the site and further reduced or reshARPened. No finished tools of this distinctive material were discovered. The large amount of thermally altered stone recovered from the site suggested the presence of thermal features. The single ceramic sherd was a thin-bodied, sand-tempered ware, with smoothed exterior and interior surfaces.

The floral material consisted of five fragments of charcoal and one carbonized seed. Faunal material consisted of four fragments of unidentifiable shell. While the chronological association of these materials could not be immediately determined, their presence indicated the potential for the recovery of significant temporal and subsistence information from the site.
Table 6-2. Prehistoric Artifact Frequency Totals from Site Evaluation (Phase II) Testing, 7NC-J-228.

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>projectile point</td>
<td>4</td>
</tr>
<tr>
<td>tool</td>
<td>16</td>
</tr>
<tr>
<td>debitage</td>
<td>481</td>
</tr>
<tr>
<td>ceramic</td>
<td>1</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>882</td>
</tr>
<tr>
<td>Total</td>
<td>1,384</td>
</tr>
</tbody>
</table>

Historical artifacts recovered during site evaluation (Phase II) testing consisted primarily of brick fragments (Table 6-3). Several sherds of pearlware, creamware, whiteware, and stoneware were recovered. In general, historical artifact distribution was low density and the materials were randomly scattered across the landform. All of the historical artifacts were recovered from the plow zone.

Table 6-3. Historical Artifact Frequency Totals from Site Evaluation (Phase II) Testing, 7NC-J-228.

<table>
<thead>
<tr>
<th>Group</th>
<th>Material</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>domestic</td>
<td>coarse earthenware (redware)</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>pearlware</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>creamware</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>whiteware</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>stoneware</td>
<td>2</td>
</tr>
<tr>
<td>architectural</td>
<td>brick fragments</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>nail, cut</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>mortar</td>
<td>1</td>
</tr>
<tr>
<td>miscellaneous</td>
<td>clinker, coal, misc. metal</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>78</td>
</tr>
</tbody>
</table>

3.6.5 Summary and NRHP Recommendations

Following the completion of site evaluation (Phase II) testing and data analysis, recommendations were made with regard to the eligibility of the site for inclusion in the NRHP.

The historical component consisted of 78 artifacts, contained entirely within the plow zone. Analysis of the distribution of these artifacts did not identify concentrations or patterns that were meaningful in terms of site structure. The artifacts included mostly early-to-late-19th century ceramics and other domestic artifacts. No structural remains or other historical features were identified during site evaluation (Phase II) investigations.

The historical component at Site 7NC-J-228 was recommended not eligible for listing in the NRHP. The component was not associated with specific events, and was not behaviorally or culturally indicative of broad patterns of history in Delaware (Criterion A), nor was it associated with locally or regionally prominent individuals (Criterion B). No structural remains were encountered that might embody distinctive construction or artistic characteristics (Criterion C). The limitations of the historical component at the site suggested
low potential for contributing substantive information to an understanding of the historical development of Delaware (Criterion D). No further archaeological investigation was recommended. Concurrence from DESHPO was granted on September 27, 1999 (Appendix A).

The prehistoric artifacts recovered during site evaluation (Phase II) investigations suggested that people living at Site 7NC-J-228 made and used stone tools, conducted a number of fire-related activities, and may have constructed storage features to keep surplus goods for future use. The presence of unplowed deposits and evidence of intact sub-plowzone features suggested that additional features could be present to offer chronological and subsistence data important to answering questions about Delaware prehistory.

Based on the results of the site evaluation (Phase II), the CR Division concluded that the prehistoric component of 7NC-J-228 retained sufficient integrity and information potential to meet eligibility criterion D for listing in the NRHP. The site had the potential to address research topics concerning the chronology of periods in Delaware ranging from the Late Archaic to the Early Woodland, as well as providing information about settlement patterns, the choices people made concerning lithic technologies, and the character of paleoenvironmental conditions facing those who lived in the region during this time (see Section 2.0, Research Design, for details of the research topics). The site further satisfied the contributing aspect of uniqueness, since few small upland campsites of this nature, particularly from earlier Woodland subperiods, have been investigated, either as part of the Smyrna-to-Pine Tree Corners segment of the SR1 corridor, or during other archaeological work in the state. Site 7NC-J-228 was thus recommended eligible for nomination to the NRHP. It was further recommended that, in accordance with the MOA of 1987, data recovery (Phase III) be undertaken to mitigate the adverse effects to the site resulting from construction of the Smyrna-to-Pine Tree Corners segment of SR1. It was anticipated that data recovery would contribute to the prehistoric research priorities established for Delaware. Specifically, data recovery (Phase III) investigations were expected to provide valuable information for inter-site comparison regarding site occupation chronology, intra-site spatial patterning, subsistence, lithic tool technology, and lithic raw material procurement. The DESHPO concurred with these recommendations in a letter dated September 27, 1999 (Appendix A).

### 3.7 Data Recovery (Phase III) at 7NC-J-228

Data recovery (Phase III) at 7NC-J-228 involved block excavations in six areas across the site (Figure 6-3). The excavations included: a small square of 9 units, Block D; several cross-shaped trenches of contiguous or semi-contiguous (alternately excavated) units, Blocks B, C, L, and M; and a large, rectangular block, Block A. The individual blocks are described below, arranged alphabetically. The stratigraphy, artifacts, and features are described for each block, followed by relevant comparative and spatial analyses of the cultural materials. Intra- and inter-site comparisons and analyses are presented in Section 8.0.
3.8 Stratigraphy and Geoarchaeological Analyses

The following sections present a detailed evaluation of the sedimentary and geomorphological contexts at 7NC-J-228, focusing on the formation processes that operated to produce the site as observed archaeologically. The analyses examine the relationships between the cultural materials documented at the site—the artifacts and cultural features—and the natural, sedimentary environment.
3.8.1 Stratigraphy

The main purpose of stratigraphic analysis is to determine whether and how the artifact assemblages recovered from the site can be separated vertically. Such analysis is based on the theory of superposition, the notion that depth is positively correlated with age; that is, the last artifacts deposited—the youngest in age—will be the first to be encountered during excavation, while the oldest artifacts will be the last encountered. In practice, sediment stratigraphy and cultural stratigraphy do not necessarily coincide, particularly in the shallow soil profiles that are often found in the Middle Atlantic region. Yet sedimentary strata are typically the first form of vertical data that investigators recognize at an archaeological site, and as such, they are the first guides available to separating the archaeological remains temporally. Acknowledging the fact that cultural strata may indeed be unaligned with soil stratigraphy, arbitrary levels were maintained within strata during the excavation at 7NC-J-228 so that vertical artifact distributions could be recombined later in the course of analysis. The purpose of the following section of the report, then, is to assess the relationship between the soil strata and cultural deposits at 7NC-J-228. Details of the geoarchaeological study on which the following summary is based are included in the full report submitted by the geoarchaeological consultant in Appendix H.

General Conditions

7NC-J-228 was the northernmost of the two prehistoric archaeological sites situated along the eastern margins of Sandom Branch (Figure 6-4). To the west lay a tributary of Sandom Branch, while wetlands, marked by ferns and other marsh vegetation, bordered the site to the east. To the south, a wide swale extended down slope toward the tributary, separating 7NC-J-228 from the southern site, 7NC-J-227. The core of the occupation debris at 7NC-J-228 occurred on a knoll that was bounded to the north by a steep drop-off to wetlands along Sandom Branch. Ground surface visibility at the time of the field investigation was poor due to leaf litter, green briar, and other brushy forest vegetation. Geoarchaeological transects were documented across the landforms (Figure 6-4), and schematic cross-sections were constructed linking stratigraphic profiles exposed in the archaeological excavations.

Stratigraphy

The soil association mapped for the site was Sassafras-Fallsington, characterized as upland soils that comprise both well-drained Sassafras sandy loams and poorly drained Fallsington loams and sandy loams. Site 7NC-J-228 lay within an area mapped as Fallsington sandy loam (Mathews and Lavoie 1970). The sediments at the site were characterized as an Ultisol (Birkeland 1984:52; Soil Survey Staff 1975:349) consisting of three main layers: an organic surface layer or topsoil; a layer of developing soil; and an unconsolidated coarse-grained substrate. The first two of these layers together comprised a Holocene mantle measuring up to 50 cm in thickness, with sandy loam-to-loamy sand textures and identified as O, A, E, and Bw soil horizons. In most of the stratigraphic profiles recorded at the site, the latter two horizons constituted a strongly developed buried soil that occurred at the top of the coarse-textured C horizon, a sandy deposit that comprised the surface of the Pleistocene-age Columbia formation.
Radiocarbon dates of 3190±60 BP (cal 2 σ BC 1615 to 1317; Beta-149040) and 2270±40 BP (cal 2 σ BC 400 to 207; Beta-149042) were obtained for bulk sediment samples collected from the buried soil at 7NC-J-228. These dates implied a late Holocene age contemporaneous with the Late Archaic and Early Woodland occupation. The dates were somewhat young for the stratigraphic contact at the top of the Columbia formation,
suggesting contamination from overlying, organic-rich horizons. Charcoal and other organics generated by prehistoric cultural activities, which may have included limited deforestation, would certainly have been added to the Holocene sandy mantle. The stratigraphic position for both of these samples indicates that the sediments were deposited in the early Holocene at the latest, and probably earlier in the Pleistocene.

Figure 6-5 illustrates the stratigraphy observed at N226.5/E451, a profile section that typified the general sequence observed in most parts of the site. The data in the figure include the results of sedimentological and geochemical analyses for a column of six samples taken from the section. The particle size analyses clearly distinguished the upper 50 cm of the profile from the relatively coarse-textured Columbia formation below (here the 2BC and 2C horizons). The buried soil (the 2ABt horizon) showed greater proportions of clay in relation to the underlying 2BC and 2C, and suggested that it was a soil formed prior to deposition of the overlying sediment. The 2ABt was enriched in organic matter, in comparison with the underlying and overlying horizons, as well as in various elements that are characteristic of strong soil formation, such as available phosphorous, exchangeable calcium, magnesium, and potassium, and citrate-dithionite extractable iron.

Figure 6-6 summarizes the stratigraphy recorded along Transect 3, running north/south from the top of the knoll containing the most intensive occupation debris down the slope toward the swale separating the site from 7NC-J-227. The section indicates that there was some variation within the horizon sequence, and some inconsistency in the thickness of the surface deposits, both phenomena probably due to localized differences in the depth of the
underlying coarse sands as well as differences in erosion at ground surface. There were also widespread areas of biological disturbance in the upper portions of the soil column, particularly south of the N226 gridline.

Lateral stratigraphic variation was evident across the site in Transect 3. The landform was an “interfluve” surface and was presumably forested throughout the Holocene (Newby et al. 1994; Webb et al. 1994). Disturbance resulting from tree throws and burrows (the latter ranging from less than a centimeter in diameter, typical of worms and insects, to those of marmots and other medium-sized mammals and extending for meters), suggested that buried cultural material from several of the excavation blocks at 7NC-J-228 had been subject to post-depositional displacement. A range of geogenic, biogenic and anthropogenic site formation processes was evident at 7NC-J-228 along Transect 3. Floral turbation was most evident south of N225. Prehistoric artifacts were sparser in this portion of the site, and some of the deeper artifact distributions may be due to vertical mixing by floral turbation. The strongly developed buried soil formed at the top of the Columbia formation was rarely disturbed, however, either by floral or faunal turbation.

In the area between N225 and N235 (i.e., Block A), there had been extensive anthropogenic disturbance, primarily during the Early Woodland period. Combined with the faunal turbation which it fostered, American Indians dislodged the former surface mantle and these actions supplied sediment that was transported further north along the transect. At N237, Holocene sediment was over 50 cm thick and featured a Bw horizon which must have been forming through at least a portion of the American Indian occupation.

The profile sampled at N237/E446.5 (Figure 6-7) was relatively undisturbed by faunal or floral turbation of the sort seen along the rest of the transect. Results of the sedimentological analyses clearly distinguish the upper 50 cm of the profile from the relatively coarse-textured Columbia formation deposit. The Columbia formation was a very well-sorted sand with a mean grain size of 0.3 mm (1.77ø). Forty percent of the C horizon was medium sand, and the low skewness value (0.02 ø) reflects relatively equal amounts of coarse sand and mud. Kurtosis values only slightly above 3.0 for the three lowest horizons indicate a nearly perfectly normal distribution.

The clay peaked at nine percent in the Bw2 horizon, representing a soil formed prior to deposition of the overlying sediment. The five upper horizons (O-A-E1-E2-Bw1) were all at least twenty percent silt, whereas the Columbia formation had less than ten percent. The fine tail in the grain-size distributions for these horizons made them appear poorly sorted, right-skewed, and platykurtic when compared to the Columbia formation sands. As a result of the right skew, the mean grain size (3.74ø = 0.07 mm) was significantly smaller than the median (1.85ø = 0.3 mm) for the upper horizons.
Figure 6-6. Geoarchaeological Stratigraphic Reconstruction, North-South Transect 3, 7NC-J-228.
Figure 6-7. Laboratory Results for Stratigraphic Column at N237/E446.5 Site 7NC-J-228.

Figure 6-8 summarizes the stratigraphy observed along Transect 4. The transect ran east-west from the surface containing the archeological features downslope across the Holocene floodplain of Sandom Branch. Twelve hand-auger borings were performed on the floodplain to characterize the sediments and to obtain samples for radiocarbon dating. Quartzose channel lag gravel was encountered at the base of all of the borings at depths ranging from 40-60 cm. A stratum of grayish brown (7.5YR5/1-5/2) fine sandy clay overlying the channel lag deposits registered the shift of the channel westward to its present location.

Woody detritus was common in the Holocene floodplain sediments. A radiocarbon age of 680±50 BP (cal 2 σ AD 1263 to 1394; Beta-149041) was obtained from detritus within the gravel in the boring at N237/E403, an off-site sample along Transect 5. The date suggested that a channel traversed this location immediately prior to the Euroamerican settlement of the Valley. The initial development of Sandom Branch could not be determined precisely since this channel evidently scoured the upper valley reaches. A final date of 240±40 BP (cal 2 σ AD 1520 to 1952; Beta-149033), at N237/E403, also an off-site sample along Transect 5, was considered invalid because of the problematic nature of the probability curve and the fact that the assay impinged on the end of the calibration data set.
Figure 6-8. Geoarchaeological Stratigraphic Reconstruction, North-South Transect 4, 7NC-J-228.
3.9 Data Recovery (Phase III) Block Descriptions

Wide-area block excavations were concentrated in the northern section of the site, near the top of the knoll and down the gentle northward trending slope, between the N224 and N238 gridlines. Block A, a 134-m² block of contiguous units, was placed in this location since artifact distributions there were the most concentrated of any area tested across the site and disturbances were the least extensive. A series of smaller blocks—B, C, D, L, and M—were placed down the southern slope to examine areas in which individual features or artifact concentrations were identified during the site evaluation (Phase II) testing program.

3.9.1 Block A

Stratigraphy

Block A consisted of 134 one-meter-square units arranged in a rectangle measuring approximately 11x14 m. Stratigraphy revealed in the excavations can be summarized as follows: an organic-enriched surface or A horizon, overlying developing soil layers including a leached or eluviated E horizon and a mineralized B horizon, with a basal deposit consisting of medium-coarse sandy C horizon.

As typified by the section profile along gridline E447, illustrated in Figure 6-9, the surface stratum, or A horizon, was a roughly 20-cm-thick deposit that included the organic O horizon identified in geoarchaeological analyses. The A horizon may have been plowed in the southern portion of the block, but there was sufficient surface-generated biological disturbance evident across all parts of the block that the entire deposit was considered to have the same potentially low contextual integrity. The underlying E horizon was present across most of the block with the exception of the southern end, where ground surface sloped downward. This eluviated layer consisted of developing soil from which clay particles and minerals had been leached by surface water draining through the sediments. The deposit measured approximately 20 cm in thickness across most of the excavation block. The B horizon comprised the buried soil, 2ABt, noted in the geoarchaeological profile. The basal C horizon represented the upper reaches of the sandy Columbia formation that underlies the Coastal Plain of Delaware.

There were variations in the profile, as illustrated in several sections drawn across the excavation block. For example, an extensive rodent disturbance was documented in the central part of the block, seen in Figure 6-9 and along the N231 gridline, in Figure 6-10. This disturbed area was originally identified as a cultural feature in the limited confines of site evaluation (Phase II) test units, but wide-area exposure in the excavation block showed it to be a deep natural disturbance. In several parts of the block, coarse sands were noted higher in the profile than in most areas: for example, the central part of the N231 section, associated with the rodent burrow (the sandy texture may in part account for the location of the burrow here), or the eastern half of the profile along the N226 gridline (Figure 6-11). Some of these features were geological in origin, part of the undulating upper surface of the Pleistocene age Columbia formation, while others may have been associated with surface disturbances such as tree falls. The profile section along the west wall of the excavation block (Figure 6-12) shows a recent tree fall (part of the decayed stump was still in place, noted in the drawing as humus) and illustrates the effect that such an event can have in terms
Figure 6-9. North/South Profile Section at E447 Gridline.
Figure 6-10. East/West Profile Section at N231 Gridline.
Figure 6-11. East/West Profile Section at N226 Gridline.
Figure 6-12. North/South Profile Section at E442 Gridline.
of stratigraphic displacement. In this case, the deposits had been rearranged in a nearly vertical order, the root mass having pulled the E and B horizon sediments to the surface. Had the roots extended more deeply or the C horizon deposits been higher in the profile, the coarse sands would have been pulled up as well.

**Artifacts**

Approximately 98 percent of the artifacts recovered from Block A were prehistoric. The remaining 2 percent were historical, the majority of those contained in the A horizon (Table 6-4). A discussion of the historical component of 7NC-J-228 is provided in Appendix C.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Historical</th>
<th>Prehistoric</th>
<th>Total by Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>160</td>
<td>3,517</td>
<td>3,677</td>
</tr>
<tr>
<td>E</td>
<td>64</td>
<td>3,141</td>
<td>3,205</td>
</tr>
<tr>
<td>B</td>
<td>--</td>
<td>256</td>
<td>256</td>
</tr>
<tr>
<td>C</td>
<td>--</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>features</td>
<td>6</td>
<td>3,185</td>
<td>3,191</td>
</tr>
<tr>
<td><strong>Total by Group</strong></td>
<td>230</td>
<td>10,114</td>
<td>10,344</td>
</tr>
</tbody>
</table>

The prehistoric artifacts were evenly distributed in the uppermost sediment horizons, with the A and E horizons each containing approximately one-third of the material. Most of the remaining third were recovered from feature proveniences, with a minor amount located in the B and C horizons. The artifacts consisted mainly of flaking debris and thermally altered stone fragments (Table 6-5). The ratio of chipped stone to thermally altered stone fragments was similar in each of the major horizon proveniences: 0.7 in the A horizon; 0.9 in the E horizon; and 0.6 in feature proveniences. In each case, the ratio indicated more burned rock than chipped stone, but in approximately the same proportion. The relative lack of variation in overall artifact frequencies between the two deposits suggested that there might be little significant cultural differentiation represented in the sediment stratigraphy. This interpretation was further investigated by spatial distribution studies presented below.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>A</th>
<th>E</th>
<th>B</th>
<th>C</th>
<th>Total by Soil Stratum</th>
</tr>
</thead>
<tbody>
<tr>
<td>flake</td>
<td>1,192</td>
<td>1,184</td>
<td>130</td>
<td>12</td>
<td>3,517</td>
</tr>
<tr>
<td>chip</td>
<td>162</td>
<td>226</td>
<td>30</td>
<td>1</td>
<td>601</td>
</tr>
<tr>
<td>core</td>
<td>15</td>
<td>14</td>
<td>2</td>
<td>--</td>
<td>8</td>
</tr>
<tr>
<td>biface</td>
<td>23</td>
<td>10</td>
<td>--</td>
<td>12</td>
<td>45</td>
</tr>
<tr>
<td>point</td>
<td>8</td>
<td>7</td>
<td>--</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>uniface</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>potlid</td>
<td>31</td>
<td>41</td>
<td>1</td>
<td>--</td>
<td>98</td>
</tr>
<tr>
<td>hammerstone</td>
<td>3</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>anvil</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>2,082</td>
<td>1,657</td>
<td>92</td>
<td>2</td>
<td>5,788</td>
</tr>
<tr>
<td>ceramic</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total by Soil Stratum</strong></td>
<td>3,517</td>
<td>3,141</td>
<td>256</td>
<td>15</td>
<td>10,114</td>
</tr>
</tbody>
</table>
Points

The basic morphological designs of points recovered in Block A were grouped as follows (conventional types that were identified within the groups are included in parentheses):

- Stemmed:
  - Straight-Stemmed: *(Lackawaxen, Woodland I stemmed)*
  - Contracting-Stemmed: *(Lackawaxen, Woodland I stemmed, Piscataway/Rossville)*
- Side-Notched: *(Lamoka, untyped)*
- Unstemmed: *(triangle)*

Stemmed

Stemmed points constituted the largest group in the collection from the block and have been divided into two main subgroups on the basis of stem shape: straight-stemmed and contracting-stemmed.

Straight-Stemmed

There were two point types in this morphological category in the Block A collection: Lackawaxen straight-stemmed and Woodland I stemmed.

- Lackawaxen Straight-Stemmed (n=1)
  
  Raw material: argillite
  
  Dimensions: length 41 mm; width 21 mm; thickness 10 mm
  
  Comments: This was a short-stemmed, narrow-bladed example of the type. The blade was asymmetrical, the blade edges slightly convex, the shoulders rounded, and the base straight. Flaking was unpatterned percussion. The point was bi-convex in cross section, and bore step fractures and uncleared humps on each face.

  Comparative data: Kinsey (1972:408-410) reported a sample of 91 straight stemmed Lackawaxen points with lengths ranging from 35 to 90 mm (mean 62), widths from 19 to 25 mm (mean 22), and thicknesses from 6 to 10 mm (mean 8). Wall et al. (1996:79-81) reported 5 varieties of Lackawaxen Straight Stemmed, two of which, Types 23A and 23B, were combined with Bare Island. Types 23A and B, and 24A, B, and C (a total sample of 67), range in length from
36 to 110 mm, in width from 17 to 29 mm, and in thickness from 6 to 13 mm. The current example is at the short end of these length ranges, and about average in terms of width and thickness.

**Chronology:** Late or Transitional Archaic. Associated radiocarbon dates range from 4560 ± 110 BP (cal 2 σ BC 3627 to 2929; Lab# I-5234) at the Faucett site, in the upper Delaware Valley (Kinsey 1975:59-60), to 2650 ± 120 BP (cal 2 σ BC 1109 to 410), further south, at the Gropp’s Lake site, in the Trenton Complex at Abbott Farm (Stewart 1987). In Delmarva, Custer and Bachman (1984) reported a date of 4200 ± 75 BP (cal 2 σ BC 2997 to 2502) at the Hawthorne site (7NC-E-46), in association with an artifact assemblage that included Lackawaxen points. At Lums Pond (7NC-F-18), Lackawaxen points were recovered in association with a cluster of features with five radiocarbon dates ranging from 2960 ± 60 BP (cal 2 σ BC 1381 to 1008) to 2660 ± 100 (cal 2 σ BC 1054 to 418) (Petraglia et al. 1998:60).

- **Woodland I straight-stemmed (n=2)**

  ![Image of Woodland I straight-stemmed points](image)

  **Raw material:** 1 cryptocrystalline, 1 quartzite

  **Dimensions:**

<table>
<thead>
<tr>
<th></th>
<th>length</th>
<th>width</th>
<th>thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>cryptocrystalline</td>
<td>28 mm</td>
<td>18 mm</td>
<td>7 mm</td>
</tr>
<tr>
<td>quartzite</td>
<td>35 mm</td>
<td>19 mm</td>
<td>8 mm</td>
</tr>
</tbody>
</table>

  **Comments:** These were small points with narrow and relatively thick blades (both had width:thickness ratios of 2.4). Their blade edges were straight, and on the cryptocrystalline specimen, there was evidence of fine pressure flaking. The points had prominent shoulders and convex
bases. While there was no cortex on the bases, often a characteristic of small stemmed points made from pebbles, the quartzite point had scattered patches of cortex on both faces of the blade. Both points showed evidence of damage: the cryptocrystalline point had a minor bending snap at the distal end; the quartzite point had a perverse fracture at the distal end and some basal damage. Both blade edges of the quartzite point and one edge of the cryptocrystalline point were inset slightly from the shoulder, resulting in an eared appearance, which is often assumed to be evidence of the resharpening of the artifact while it was still hafted (George and Davis 1985).

Comparative data: A sample of 47 small, stemmed points was documented at the Hickory Bluff site (7K-C-411), on the St. Jones River (Petraglia et al. 2002). The lengths of the points in the Hickory Bluff sample ranged from 26 to 45 mm (mean 34), widths from 15 to 28 mm (mean 19), and thicknesses from 6 to 18 mm (mean 8). The current specimens were at or below the mean for each dimension.

Chronology: The precise chronological status of these small stemmed points is as yet uncertain. As implied by the type name used for identification in this study, it is held that the points are generally Early-to-Middle Woodland in date. At the Hickory Bluff site, they were found in association with Early and Middle Woodland ceramic assemblages (Petraglia et al. 2002).

**Contracting-Stemmed**

This group consisted of a series of both narrow and wide bladed points that share a characteristic stem shape, wide at the neck and contracting to a rounded base. Blades are typically isosceles triangles, with straight to convex edges. There were 7 points in this group in the collection from Block A: 2 Lackawaxen, 2 Woodland I stemmed, and 3 Piscataway/Rossville.

- **Lackawaxen Contracting-Stemmed (n=2)**

  Raw material: quartz
  
  Dimensions:

<table>
<thead>
<tr>
<th></th>
<th>length</th>
<th>width</th>
<th>thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>quartz</td>
<td>34 mm</td>
<td>19 mm</td>
<td>6.5 mm</td>
</tr>
<tr>
<td>quartz</td>
<td>47 mm</td>
<td>25 mm</td>
<td>10.3 mm</td>
</tr>
</tbody>
</table>

  Comments: These were short-bladed examples of the Lackawaxen type. Blade edges varied from straight to convex, and flaking was generally percussion. Shoulders were rounded to prominent, stems were sharply contracting, and bases were convex. Both points were plano-
convex in cross section, and appeared to have been made on bipolar core fragments or large flakes. The larger of the points had knots and stacks on both faces. The blade was asymmetrical, suggesting resharpening, and there was no evidence of damage. The smaller point had wide and flat perverse fractures on one face beginning at the shoulders, suggesting that a large portion of the blade had spalled away and that the remaining part had been resharpened to form a shortened blade.

Comparative data: Contracting-stemmed Lackawaxen points in Kinsey’s (1972:408-410) sample of 47 points had lengths ranging from 46 to 79 mm (mean 63), widths from 19 to 26 mm (mean 22), and thicknesses from 5 to 9 mm (mean 7). Kraft (1979) reported a sample of 7 points from Tocks Island with lengths ranging from 53 to 108 mm, widths from 20 to 27 mm, and thicknesses from 6 to 12 mm. Contracting stemmed Lackawaxen points compare with Wall et al.’s (1996) Poplar Island types 25D, 25E, 25G, and 25H, at Abbott Farm. Of the 45 points in their sample, lengths ranged from 30 to 99 mm, widths from 12 to 35 mm, and thicknesses from 5 to 11 mm. The examples from 7NC-J-228 occur at the low end of the reported length ranges, but were near average in terms of width and thickness.

Chronology: Late Archaic. See the discussion of the Lackawaxen straight-stemmed type above for associated radiocarbon assays.

- **Woodland I contracting-stemmed** (n=2)

  Raw material: 2 cryptocrystalline

  ![Fragments](image)

  Dimensions:

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>cryptocrystalline</td>
<td>30 mm</td>
<td>17 mm</td>
<td>5 mm</td>
</tr>
<tr>
<td>cryptocrystalline</td>
<td>34 mm</td>
<td>20 mm</td>
<td>9 mm</td>
</tr>
</tbody>
</table>
Comments: Both points were small, and neither was well-made. The smaller point, on the right, was made on a cortical flake, and remnant cortex covered approximately 75 percent of one face. Flaking was marginal on both faces of the point, with flake scars crossing the centerline only at the distal tip. Blade edges were slightly convex, but irregular, the shoulders were prominent, and the base was convex. Parts of the artifact were reddened, indicating oxidation of the iron content of the stone. The color did not extend to the cortex, suggesting that the reddening was not a result of heating. The second point also had irregular, convex blade edges. There were stacks on both faces, the shoulders were rounded, the stem wide, and the base convex. A perverse fracture was noted on one side of the base that may have been related to manufacture.

Comparative data: A sample of 47 small, stemmed points was documented at the Hickory Bluff site (7K-C-411), on the St. Jones River (Petraglia et al. 2002). While most of those points were straight-stemmed, the manufacturing technology appeared to have been similar enough to the current points that the sample was used for comparative purposes. The lengths of the points in the Hickory Bluff sample ranged from 26 to 45 mm (mean 34), widths from 15 to 28 mm (mean 19), and thicknesses from 6 to 18 mm (mean 8). The current specimens were above the mean for each dimension.

Chronology: The chronological status of these small, stemmed points is as yet uncertain. As implied by the type name used for identification, it is held that the points are generally Early-to-Middle Woodland in date. They were found in association with Early and Middle Woodland ceramic assemblages at the at Hickory Bluff site (Petraglia et al. 2002).

- Piscataway/Rossville (n=3)

Raw material: 2 quartz, 1 cryptocrystalline

Dimensions:

<table>
<thead>
<tr>
<th></th>
<th>length</th>
<th>width</th>
<th>thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>range</td>
<td>32-36 mm</td>
<td>14 mm</td>
<td>8-9 mm</td>
</tr>
<tr>
<td>mean</td>
<td>34 mm</td>
<td>14 mm</td>
<td>8 mm</td>
</tr>
<tr>
<td>standard deviation</td>
<td>2.0</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>coefficient of variation</td>
<td>0.06</td>
<td>0.00</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Comments: Three narrow, lozenge-shaped points with similar dimensions, as indicated by low coefficients of variation. All three were thick, with width:thickness ratios of less than 2.0 (range=1.6-1.8). The cryptocrystalline point had medial ridges on both faces, a bending snap break at the proximal end, and an impact fracture at the distal end. Both ends of the artifact were reddened, although whether due to heating could not be determined with certainty. Both quartz points had stacks on one or both faces, producing thick cross sections. One of the quartz points bore a perverse fracture that had damaged most of the base.

Comparative data: The distinction between the Piscataway and Rossville types is unclear, and may be in part geographical. Piscataway was originally reported by Stephenson and Ferguson (1963:146-7) at the Accokeek Creek, in southern Maryland. Examples from the site ranged in length from 29 to 49 mm (mean 37), in width from 10 to 21 mm (mean 14), and in thickness from 5 to 10 mm (mean 7). The dimensions of the points reported here were at or near those averages. Rossville was named by Ritchie (1971:46), based on reports from the type site on Staten Island, New York. Ritchie’s sample of 72 Rossville points measured 32 to 64 mm in length (mean 48), 16 to 32 mm in width (mean 24), and 6 to 11 mm in thickness (mean 8). Kinsey (1972:436) reported a sample of 10 Rossville points with lengths ranging from 35 to 61 mm (mean 47), widths from 14 to 26 mm (mean 20), and thicknesses from 6 to 11 mm (mean 8). A sample from the Faucett site, also in the upper Delaware Valley had similar mean dimensions: length 45 mm, width 22 mm, thickness 8 mm. Lastly, Wall et al. (1996:65) reported a sample of 53 Rossville points (his Type 8), from the Abbott Farm sites with lengths ranging from 29 to 66 mm, widths from 15 to 27 mm, and thicknesses from 4 to 19
Sandom Branch Site Complex

mm. The specimens from 7NC-J-228 occur at the lower end of these reported ranges.

Chronology: Early-Middle Woodland. The lack of absolute dates associated with Piscataway points has spawned a number of wide-ranging chronological assessments of the type, with some estimates placing the origin in the latter portions of the Late Archaic. Piscataways have been reported, for example, in presumed Late Archaic levels at Ruppert Island, on the Maryland shore of the Potomac (Evans 1984), and below a component referred to as Vernon, radiocarbon dated to ca. 3150 BC at the Fraser site, also on the lower Potomac (McDowell 1972). Stratigraphic contexts at these sites are difficult to assess, but based primarily on these reports, Steponaitis placed Piscataway in her Late Archaic I sub-phase (4000 to 3000 BC) along the Patuxent River. In southern Virginia, Mouer (et al. 1981:64-5) dated Piscataway by association to 1000 to 500 BC. Johnson's (1985:10; Table 1) survey of Piscataway chronology in Fairfax County, Virginia, suggested that manufacture of the type may have extended well into the Middle Woodland Period.

Ritchie (1969:224) considered Rossville to be a minority component of his Lagoon Complex, dated 2470 ± 120 BP (cal 2 σ BC 839 to 234) and 2380 ± 80 BP (cal 2 σ BC 769 to 234), at sites on Martha’s Vineyard, and he considered the type to extend into the Middle Woodland. Kinsey (1972:436) associated Rossville with the Bushkill complex, in the upper Delaware Valley, radiocarbon dated at the Miller Field site as 2430 ± 80 BP (cal 2 σ BC 774 to 393). Wall et al. (1996:66) noted comparable forms from Cross’s original excavations at Abbott Farm that may suggest a carry over into the Late Woodland.

Side-Notched

Side-notched points as a group share the hafting element feature by which the category is named, formed by relatively wide and shallow notches emanating from the blade edges and typically resulting in distinct shoulders. Two side-notched points were recovered from Block A, one similar to the Lamoka type, the other untyped.

- Lamoka (n=1)
  
  Raw material: quartz
  Dimensions: length 40 mm; width 24 mm; thickness 10 mm
  Comments: This was a relatively short, and thick point (width: thickness ratio 2.4),
manufactured by percussion flaking. The blade edges were slightly convex and beveled in some places, where step fractures had produced small stacks. The blade was somewhat asymmetrical in outline. Wide and shallow side notches lay below prominent shoulders. The blade edges were inset at the shoulders, which is often characteristic of an artifact that has been resharpened while hafted. The base was convex and not fully thinned, and there was evidence of dulling on the basal edge and notches, probably from haft wear rather than purposeful grinding. The point was similar morphologically to both the Brewerton type, a Late Archaic form that is distributed across the Northeast (Ritchie 1971), and the Halifax type, of similar age, distributed across the Virginia and North Carolina Piedmont (Coe 1964).

Comparative data: The type site for the Lamoka point lies in west-central New York. The geographic distribution of the type is centered there, though examples of this type are also reported throughout Middle Atlantic region (Inashima 1989; Hranicky 1991). Both stemmed and notched variants are reported. The present example fell at the large end of most of the published dimensional ranges: length 25 to 63 mm and thickness 6 mm, for the New York examples (Ritchie 1971:29); length 27 to 41 mm (mean 34), width 14 to 28 mm (mean 17), and thickness 4 to 8 mm (mean 6), for certain Pennsylvania examples (Kinsey 1972:421); and finally, length 28 to 34 mm (mean 31), width 15 to 24 mm (mean 19), stem length 8 to 16 (mean 11), and thickness 4 to 8 (mean 6), for specimens from southwest Virginia (Holland 1970:88).


- Untyped (n=1)
  - Raw material: quartzite
  - Dimensions: length 20 mm; width 18 mm; thickness 6 mm
  - Comments: This was a short, heavily
reworked point with a damaged base. The side notches were wide and relatively shallow, and the shoulders prominent. Blade edges were straight-to-slightly convex, the blade was asymmetrical, and the tip moderately acuate (the edge breaking from convex to slightly concave near the tip). The base was missing at an oblique snap break running from one basal tang to near the center of the opposite side notch.

Comparative data: n/a

Chronology: n/a

**Unstemmed**

In these forms, the blade and base meet without producing a formal stem. The hafting element consists of the base and the lower portion of the blade. Two points, both untyped triangles, were recognized from Block A.

- **Triangle (n=2)**

  Raw material: cryptocrystalline
  Dimensions:

<table>
<thead>
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<th></th>
<th>length</th>
<th>width</th>
<th>thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>cryptocrystalline</td>
<td>34 mm</td>
<td>16 mm</td>
<td>7 mm</td>
</tr>
<tr>
<td>cryptocrystalline</td>
<td>38 mm</td>
<td>27 mm</td>
<td>7 mm</td>
</tr>
</tbody>
</table>

  Comments: Both points occurred in the form of isosceles triangles. The larger point was recovered in two pieces, separated by a horizontal distance of 3.6 m. The point appeared to have snapped obliquely during manufacture, in a failed attempt to clear a stack on one face. Previous attempts had produced the concave shape of one of the blade edges.
The opposite edge was straight. The base was somewhat concave, but may not have been finished. The smaller point was narrow, with straight blade edges and a straight base. An oblique snap break had removed part of the blade from near the tip to a point just above the base.

Comparative data: While the points were either unfinished or too badly damaged to allow confident typing, metrical data from the Levanna type, which they most closely resemble, are presented for comparative purposes. A sample of 250 Levanna points was reported by Ritchie (1971:31) with lengths ranging from 22 to 76 mm (most between 32 and 45 mm), widths from 21 to 35 mm, and thicknesses averaging 5 mm. Kinsey (1972:441-442) reported examples from the upper Delaware Valley with lengths ranging from 18 to 45 mm (mean 34), widths from 18 to 34 mm (mean 22), and thicknesses from 3 to 5 mm (mean 4). The two specimens from 7NC-J-228 were thicker than the reported samples, but otherwise occur at or below the means for each range.

Chronology: Late Woodland. Ritchie (1971:31) noted that the Levanna type originally appeared in New York around AD 700, though it did not become common until AD 900. It was gradually replaced by smaller, straight-based types such as the Madison type by the mid-fourteenth century.

Fragments

In total, 6 point fragments were recovered from Block A. These pieces were too small to be typed, but exhibited characteristics, such as finely flaked edges, which indicated that they were derived from finished bifaces. Three of the fragments were cataloged as distal segments, and three were cataloged as proximal segments.

- Distal Fragments (n=3)
  Raw material: cryptocrystalline
  Description: All three fragments consisted of extreme distal ends (or point tips), each measuring <20 mm in length, and each was broken at an oblique snap break.

- Proximal Fragments (n=3)
  Raw material: 2 cryptocrystalline, 1 quartz
  Description: 1 cryptocrystalline fragment was the stem and shoulder from a small, straight-stemmed point, with a transverse snap break and no basal damage. The remaining specimens were stem fragments from small, contracting-stemmed points. Both exhibited bending snap breaks and no basal damage. A small patch of cortex was left on the base of the quartz specimen.
Bifaces

- Early Stage Bifaces (n=19)

  Raw material: 8 quartz, 8 cryptocrystalline, 3 quartzite
  Dimensions: whole specimens, n=12

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<tbody>
<tr>
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<td>29-99 mm</td>
<td>15-40 mm</td>
<td>1.6-2.7</td>
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<tr>
<td>mean</td>
<td>63.5 mm</td>
<td>48.0 mm</td>
<td>22.6 mm</td>
<td>2.1</td>
</tr>
<tr>
<td>standard deviation</td>
<td>31.9</td>
<td>19.1</td>
<td>7.8</td>
<td>0.3</td>
</tr>
<tr>
<td>coefficient of variation</td>
<td>0.50</td>
<td>0.40</td>
<td>0.34</td>
<td>0.15</td>
</tr>
</tbody>
</table>

Of the 19 examples, over one-half were whole or unbroken artifacts—the count of whole artifacts included two quartzite fragments that refit to form a single biface. The amount of flaking on the specimens varied from minimal to extensive. Over one-half (58 percent) retained cortex—the majority of the cryptocrystalline bifaces exhibited cortex, the majority of the quartz bifaces did not. Variation within the measured dimensions ranged between 34 and 50 percent (as calculated in the coefficient of variation). Width:thickness ratios displayed less variation, 15 percent, indicating that while there was some variation in the overall sizes of the bifaces, most were relatively thick, which is, of course, one of the defining attributes of the artifact type. The bifaces generally appeared to have been made on pebbles or small cobbles, and the variations recorded in dimensions appeared related to the shape of the original nodule, and not the amount of flaking and relative shaping that had been carried out. Among the whole bifaces were several flat pebbles that had been discarded after an edge had been started in one or two isolated locations but revealed poor quality raw material. Several of the quartz examples exhibited transverse snap breaks or perverse breaks along material flaws, while other examples of quartz and of cryptocrystalline material had substantial edges established but were too thick for further thinning or shaping.

- Late Stage Bifaces (n=22)

  Raw material: 16 cryptocrystalline, 6 quartz
  Dimensions: whole specimens, n=5

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>range</td>
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<td>18-38 mm</td>
<td>8-18 mm</td>
<td>1.8-3.9</td>
</tr>
<tr>
<td>mean</td>
<td>53.0 mm</td>
<td>27.2 mm</td>
<td>11.2 mm</td>
<td>2.5</td>
</tr>
<tr>
<td>standard deviation</td>
<td>10.8</td>
<td>9.1</td>
<td>4.0</td>
<td>0.8</td>
</tr>
<tr>
<td>coefficient of variation</td>
<td>0.20</td>
<td>0.33</td>
<td>0.35</td>
<td>0.32</td>
</tr>
</tbody>
</table>

The majority of the late stage bifaces, over 75 percent (17 of 22), were fragments. Slightly less than 75 percent (16 of 22) did not retain cortex on either face. Where cortex was present, it often occurred on the base of the artifact and appeared intentional, in a pattern also seen in finished points from the site. The object of this practice, whether function or style, has not been determined, although inconsistency in location seems to argue for the latter. One of the complete bifaces consisted of two refitted fragments that formed a narrow, lozenge shaped artifact. Three of the six complete bifaces and several of the larger fragments displayed the same distinctive lozenge shape. Among the proximal fragments, breaks consisted of transverse or perverse snaps, the latter often at flaws, and all breaks appeared to
have occurred during manufacture rather than use. There were two small stem fragments, with snap breaks at the neck or shoulder. Based on the level of completion of the artifacts, these breaks also appeared to have been related to manufacture. Among the distal fragments, several of which were small tip fragments, breaks were again a combination of transverse and oblique snaps along with perverse fractures at material flaws. There was relatively little evidence of extensive platform preparation, such as may be seen on late stage bifaces as controlled, patterned flaking replaces the less well-controlled chipping associated with edge production, decortification, and initial thinning.

**Cores**

There were 38 cores recovered from Block A. They were subdivided on the basis of the form of percussion used in their reduction: bipolar and multi-directional freehand.

- **Bipolar (n=31)**

  Raw material: 20 cryptocrystalline, 10 quartz, 1 quartzite

  Dimensions:

<table>
<thead>
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<th>length</th>
<th>width</th>
<th>thickness</th>
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</thead>
<tbody>
<tr>
<td>range</td>
<td>32-79 mm</td>
<td>21-64 mm</td>
<td>11-36 mm</td>
</tr>
<tr>
<td>mean</td>
<td>49.6 mm</td>
<td>35.8 mm</td>
<td>21.9 mm</td>
</tr>
<tr>
<td>standard deviation</td>
<td>10.7</td>
<td>9.9</td>
<td>5.6</td>
</tr>
<tr>
<td>coefficient of variation</td>
<td>0.22</td>
<td>0.28</td>
<td>0.25</td>
</tr>
</tbody>
</table>

  All but one of the bipolar cores was pebble-sized. All bore evidence of reduction on an anvil, with flake scars emanating from opposing ends of the artifact, sheared planes, and crushed platforms. There were few exhausted cores, and all but three retained cortex, usually across more than 50 percent of the surface area. Most showed a minimal amount of flaking, with the pebble split or one set of flakes removed to test the material. Discard usually appeared to have been related to poor material quality. About one-quarter of the cores bore evidence of additional flake removals, including three that had been struck more than once on perpendicular axes.

- **Multi-directional freehand (n=7)**

  Raw material: 5 quartz, 1 quartzite, 1 cryptocrystalline

  Dimensions:

<table>
<thead>
<tr>
<th></th>
<th>length</th>
<th>width</th>
<th>thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>range</td>
<td>54-102 mm</td>
<td>39-77 mm</td>
<td>13-53 mm</td>
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<tr>
<td>mean</td>
<td>74.0 mm</td>
<td>56.3 mm</td>
<td>32.4 mm</td>
</tr>
<tr>
<td>standard deviation</td>
<td>19.3</td>
<td>18.0</td>
<td>12.9</td>
</tr>
<tr>
<td>coefficient of variation</td>
<td>0.26</td>
<td>0.32</td>
<td>0.40</td>
</tr>
</tbody>
</table>

  The multi-directional freehand cores exhibited multiple flake scars, but no evidence of anvil-based percussion. The cores included 4 cobbles and 3 pebbles. Only one exhibited more than minimal flaking, implying that the rest had been discarded after testing for raw material quality. Two specimens were small quartz nodules (pebble or small cobble), that had been tested and discarded after a single flake removal. They were not considered uni-directional
cores, since neither artifact displayed evidence of preparation for flake removals from a single platform. All of the freehand cores contained remnant cortex.

**Hammerstones and Anvil**

- **Hammerstones (n=4)**

  Raw material: 3 quartzite, 1 cryptocrystalline

  Dimensions:

<table>
<thead>
<tr>
<th></th>
<th>length</th>
<th>weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>range</td>
<td>57-94 mm</td>
<td>93-542 gm</td>
</tr>
<tr>
<td>mean</td>
<td>76.1 mm</td>
<td>297.1 gm</td>
</tr>
<tr>
<td>standard deviation</td>
<td>15.4</td>
<td>185.1</td>
</tr>
<tr>
<td>coefficient of variation</td>
<td>0.20</td>
<td>0.62</td>
</tr>
</tbody>
</table>

  The largest of the hammerstones was a cobble of irregular, dense cryptocrystalline material, measuring 94 mm in length and weighing over 500 gm. The cobble had battering and erratic flaking emanating from one end. Of the quartzite hammerstones, one was small, with battering at one end. A second quartzite hammerstone exhibited battering at both ends, while the third showed battering along a broad surface rather than the more prominent ends, suggesting that it was used in bipolar percussion.

- **Anvil (n=1)**

  Raw material: quartzite

  Dimensions: length 146 mm; weight 1.7 kg

  The anvil was a large quartzite cobble that was substantially larger than the hammerstones. It showed wear in the form of pitting on one broad face, such as results from use in the indirect percussion associated with bipolar reduction.

**Flaking Debris**

There were over 4,100 fragments of flaking debris recovered from the excavations in Block A (Table 6-6). Slightly more than two-thirds of the debris consisted of cryptocrystalline material, while quartz made up the majority of the remainder.

<table>
<thead>
<tr>
<th>Material</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>cryptocrystalline</td>
<td>2,787</td>
<td>(68%)</td>
</tr>
<tr>
<td>quartz</td>
<td>1,204</td>
<td>(29%)</td>
</tr>
<tr>
<td>quartzite</td>
<td>100</td>
<td>(2%)</td>
</tr>
<tr>
<td>other</td>
<td>13</td>
<td>(&lt;1%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,104</td>
<td></td>
</tr>
</tbody>
</table>

General characteristics of the flaking debris were examined with the goal of determining whether clear differences could be observed between the two main sediment layers, the A and E horizons, that might imply cultural stratification. In sum, there was relatively little
difference in the attributes studied. The relative proportions of the raw material types, for example, were similar in the two layers, with cryptocrystalline materials accounting for nearly three-quarters of the debitage in the A horizon and nearly two-thirds in the E horizon (Table 6-7). Further analysis of the counts of the three major material types implied that there was a significant statistical difference between the numerical distributions in the two sediment layers ($\chi^2=31.6; df=4; p=0.000$). Yet other comparisons suggested that the flaking debris in the two sediment layers was in fact similar. For example, the relative proportions of cortex-bearing fragments among cryptocrystalline and quartz debris were nearly identical in both the A and E horizons (Table 6-8). The proportion of non-cortical quartzite debris was, in contrast, higher in the E horizon.

| Table 6-7. Lithic Material Distribution, Flaking Debris by Sediment Horizon, Block A. |
|---------------------------------|------------|----------|--------|-------|
|                                 | Cryptocrystalline | Quartz   | Quartzite | Other$^1$ |
| A horizon                       | 997        | 74%      | 326     | 24%   | 28      | 2%   | 3      | 0%   |
| E horizon                       | 935        | 64%      | 478     | 33%   | 44      | 3%   | 7      | 0%   |
| B horizon                       | 97         | 61%      | 58      | 36%   | 4       | 3%   | 1      | 1%   |
| C horizon                       | 7          | 54%      | 6       | 46%   | 0       | 0%   | 0      | 0%   |
| features                        | 748        | 67%      | 335     | 30%   | 24      | 2%   | 2      | 0%   |
| Total by Material               | 2784       | 1203     | 100     | 13    | 1       | 1     |

$^1$ includes argillite, rhyolite, ironstone, sandstone

| Table 6-8. Distribution of Cortical Flaking Debris in A and E Horizons, Block A. |
|---------------------------------|------------|----------|--------|-------|
|                                 | Cryptocrystalline | Quartz   | Quartzite |       |
| A horizon                       | non-cortical  | 56%      | 69%      | 57%   |
|                                | cortical      | 44%      | 31%      | 43%   |
| E horizon                       | non-cortical  | 56%      | 67%      | 82%   |
|                                | cortical      | 44%      | 33%      | 18%   |
| Total by Material               | n=1932       | n=804    | n=72    |

The size ranges of flaking debris in the two main horizons were also nearly identical when analyzed by lithic material type, as illustrated by a line chart of the distributions of the cryptocrystalline material (Figure 6-10). The distribution of quartz debris in the two layers (not illustrated) was also similar. The distribution varied somewhat for quartzite debris, where more small quartzite flakes occurred in the E horizon than in the A horizon (Figure 6-13). The quartzite findings coincided with the cortical distribution noted above—i.e., there was less cortical material in the E horizon. Cortical debris, which is often produced early in the reduction sequence, can tend to be larger than non-cortical debris. Yet, a test of the difference of proportions conducted at the interval with the largest samples, size-grade 2, implied that the difference in the size distribution of quartzite was not statistically significant ($z=0.68, p<0.01$).
Ceramics

One ceramic sherd was recovered from Block A.

- Marcey Creek (n=1)

The single Marcey Creek sherd was assigned to an assemblage of similar ceramics: Lot MA1 (see below).

Segment: body
Dimensions: thickness: 8 mm; weight: 7.2 gm
Temper: crushed steatite
Surface treatment: exterior, smoothed; interior, smoothed

Description: Crushed steatite comprised approximately 25 percent of the paste. Many fine particles of pink clay were apparent in the paste, suggesting incomplete mixing of more than one type of clay. Natural inclusions comprised 22 percent of the paste and included poorly sorted quartz, feldspar, olivine, mica and iron oxide. The smoothed exterior surface was weathered. A full description of the lot is included in Appendix G, Lot MA1.

Marcey Creek was originally identified at the type site on the Potomac River, outside of Washington, D.C. (Manson 1948). Marcey Creek is considered one of the earliest ceramic wares in the Delmarva. A temporal span of 1200 to 700 BC has been suggested (Custer 1994).
Features
Twelve features were documented in Block A, including 6 thermally altered stone concentrations (Plate 6-1) and 6 pit or basin features (Plate 6-2; Figure 6-14). The following section provides descriptive information including morphology and dimensions, and a brief summary of contents. The results of analyses of the features follow the descriptive summaries.
Figure 6-14. Feature Locations, Block A.
Feature 1

Centerpoint
N234.44/E450.41

Type
A-1a: Thermally Altered Stone

Morphology
Plan: Circular
Profile: Planar

Elevation
9.65 m AMSL(Top of E horizon)

Dimensions
Length: 120 cm
Width: 110 cm
Depth: N/A

Soil Classification
Brownish Yellow
10YR6/6
Loamy Sand

Artifacts
315 (36.484 kg) Thermally Altered Stones
10 Flakes
1 Core
5 Chips

Ecofacts
Total: .08g (2 l flotation)
10 Unidentifiable Charcoal

Radiocarbon Assay
Not Dated

Description
Feature 1 consisted of a cluster of whole and fragmented thermally altered stones with additional stones scattered within one meter of the main cluster. The feature was identified 10 cm below the ground surface, and all of the stones were located on a single plane. There was no evidence of soil discoloration or associated basin. Thermally altered lithic materials included quartzite (47 percent), quartz (44 percent), chert, jasper, sandstone, ironstone, and gneiss. Twenty percent of the thermally altered stones were whole.
Plan:

Profile:

Key
thermally altered stone
Feature 7

Centerpoint
N229.00/E446.00

Type
B-1c: Basin

Morphology
Plan: Oval
Profile: Steep-Sided, Rounded Bottom

Elevation
9.92 m AMSL
(E horizon)

Dimensions
Length: 240 cm
Width: 140 cm
Depth: 86 cm
Volume: 1097.24 liters

Soil Classification
Dark Yellowish Brown
10YR4/6
Loamy Sand (center)
Yellowish Brown

10YR5/8
Sandy Loam (sides/base)

Artifacts
176 (4.049kg) Thermally Altered Stones
3 Projectile Points (#500-1, untyped, small side notched), (#523-1, proximal), (525-1, untyped, small contracting-stemmed)
3 Late Stage Bifaces; 1 Early Stage Biface; 1 Core
352 Flakes; 18 Chips

Ecofacts
Total: .07g (2 l flotation)
2 Acer sp. Charcoal
3 Quercus sp. (white group) Charcoal
6 Ring Porous Charcoal
5 Deciduous Taxa Charcoal

Radiocarbon Assay
3770±40 BP (cal 2 σ BC 2334 to 2037 ; Beta-149039)

Description
In opening plan view, Feature 7 was an elongated oval. The excavated profile revealed darker soil in the center of the feature and a band of lighter soil along the sides and base. The differential soil color was the result of soil development rather than deposition. The fill soils were darker than the surrounding E and B horizons. The northern boundary of Feature 7 was estimated: the northern portion of the feature, located in the test unit at N230/E446, was removed during excavation of an adjacent feature that was later determined to be a natural disturbance. Over 500 artifacts, mostly flaking debris, were recovered from Feature 7.
**Feature 9**

**Centerpoint**
N233.50/E451.78

**Type**
B-1c: Basin

**Morphology**
Plan: Irregular Oval
Profile: Steep Sided, Undulating Base

**Elevation**
9.63 m AMSL
(E horizon)

**Dimensions**
Length: 200 cm
Width: 140 cm
Depth: 84 cm
Volume: 894.19 liters

**Soil Classification**
Dark Yellowish Brown
10YR4/6
Loamy Sand
Yellowish Brown
10YR5/6
Loamy Sand

**Artifacts**
42 (2.245 kg) Thermally Altered Stones
35 Flakes; 2 Chips
1 Late Stage Biface

**Ecofacts**
Not Collected

**Radiocarbon Assay**
Not Dated

**Description**
Feature 9 was a basin with steeply sloped sides and an undulating base. Excavation revealed extensive rodent disturbance. Burrowing and displaced soil contributed to the irregular morphology of the base of the feature. Undisturbed feature fill contained charcoal flecking. Artifacts were recovered from disturbed and undisturbed fill.
Plan: N235 + + + + + N234 + + + + + N233 + + + + +

Profile: A + + + + + + + A' E450 E451 E452 E453

Key
/ / / limit of rodent root disturbance

Feature 9
line level 9.75 m amsl
contour interval 20 cm
excavation surface
**Feature 21**

**Centerpoint**
N229.41/E448.73

**Type**
A-1c: Thermally Altered Stone

**Morphology**
Plan: Irregular
Profile: Planar

**Elevation**
10.02 m AMSL
(E horizon)

**Dimensions**
Length: 300 cm
Width: 110 cm
Depth: N/A

**Soil Classification**
Dark Yellowish Brown
10YR4/6
Loamy Sand
(E horizon)

**Artifacts**
183 (12.678 kg) Thermally Altered Stone
1 Late Stage Biface
1 Chip

**Ecofacts**
Total: .08g (2 l flotation)
7 Ring Porous

**Radiocarbon Assay**
Not Dated

**Description**
Feature 21 consisted of a scatter of thermally altered stone, with a tight cluster of smaller fragments located near the center of the main scatter. The cluster measured approximately 75 by 60 cm, the overall scatter as noted above. No soil discoloration was noted in association with the feature. Thermally altered lithic materials included quartzite (64 percent), quartz (34 percent), siltstone, sandstone, gneiss, jasper, and chert. Ninety-eight percent of the thermally altered stone assemblage consisted of fragmented stones. Non-thermally altered stone artifacts were recovered from within the bounds of the scattered stone.
Plan:

Key
thermally altered stone

Feature 21

thermally altered stone

0  20  40  60 cm
**Feature 22**

**Centerpoint**
N228.96/E445.56

**Type**
A-1c: Thermally Altered Stone

**Morphology**
Plan: Irregular
Profile: Uncoursed, Multi-level

**Elevation**
10.02 m AMSL
(E horizon)

**Dimensions**
Length: 200 cm
Width: 125 cm
Depth: 10 cm

**Soil Classification**
Dark Yellowish Brown
10YR4/6
Loamy Sand
(E horizon)

**Artifacts**
71 (8.569 kg) Thermally Altered Stones
2 Early Stage Bifaces

**Ecofacts**
Not Collected

**Radiocarbon Assay**
Not Dated

**Description**
Feature 22 was a scatter of thermally altered stone. The majority of the stones were located on a single plane. Additional stones were recovered up 10 cm below the depth at which the feature was first identified. Soil was consistent in color and texture with the surrounding E horizon. Feature 22 occurred above the opening plan boundaries of the Feature 7 (basin). Thermally altered lithic materials included quartzite (50 percent), quartz (29 percent), jasper, gneiss, siltstone, and sandstone. Ninety-two percent of the thermally altered stone assemblage consisted of fragmented stones. Non-thermally altered stone artifacts were recovered from within the bounds of the scattered stone. The image below shows the southern part of the feature, below the N230 gridline.
Plan:

Key
thermally altered stone

Feature 22
Feature 23

Centerpoint
N226.75 E448.00

Type
A-1c: Thermally Altered Stone

Morphology
Plan: Linear
Profile: Planar

Elevation
10.02 m AMSL
(E horizon)

Dimensions
Length: 500 cm
Width: 200 cm
Depth: N/A

Soil Classification
Dark Yellowish Brown
10YR4/6
Loamy Sand
(E horizon)

Artifacts
141 (11.904 kg) Thermally Altered Stones
1 Early Stage Biface
1 Core

Ecofacts
Not Collected

Radiocarbon Assay
Not Dated

Description
Feature 23 was a linear scatter of mostly fragmented thermally altered stones. The stones were distributed primarily along an east-west axis. Thermally altered lithic materials included quartzite (88 percent), quartz (7 percent), jasper, and sandstone. Ninety-eight percent of the thermally altered stone assemblage consisted of fragmented stones. Non-thermally altered stone artifacts were recovered from within the bounds of the scattered stone. In the image below, Feature 23 comprises the artifact scatter in the foreground, while the cluster in the background is Feature 21.
Plan:

Key
thermally altered stone

Feature 23
**Feature 26**

**Centerpoint**  
N236.52/E446.24

**Type**  
A-1c: Thermally Altered Stone

**Morphology**  
Plan: Irregular  
Profile: Planar

**Elevation**  
9.61 m AMSL  
(Top of E-horizon)

**Dimensions (as excavated)**  
Length: 400cm  
Width: 200 cm  
Depth: N/A

**Soil Classification**  
Yellowish Brown  
10YR5/6  
Loamy Sandy  
(E horizon)

**Artifacts**  
170 (18.846 kg) Thermally Altered Stones  
8 Flakes  
1 Core

**Ecofacts**  
Not Collected

**Radiocarbon Assay**  
Not Dated

**Description**  
Feature 26 was a scatter of thermally altered stones located on a single plane at the top of the E-horizon. The feature extended under a hardwood tree to the northeast, and thus the northern boundary of the feature was undefined. The scatter of stones exhibited no discernable patterning and was disturbed by modern tree roots. Thermally altered lithic materials included quartzite (67 percent), quartz (25 percent), jasper, and chert. Ninety-eight percent of the thermally altered stone assemblage consisted of fragmented stones. The chipped stone artifacts were recovered from within the bounds of the scattered stone. The image below shows the central part of the feature, between the E446 and E448 gridlines.
Plan:

Key

thermally altered stone

roots

limit of excavation

Feature 26
**Feature 34**

**Centerpoint**
N225.80/E447.10

**Type**
B-1c: Basin

**Morphology**
Plan: Oval
Profile: Steep-Sided, Rounded Bottom

**Elevation**
10.12 m AMSL
(E-horizon)

**Dimensions**
Length: 220 cm
Width: 108 cm
Depth: 85 cm
Volume: 768.94 liters

**Soil Classification**
Dark Yellowish Brown
10YR4/6
Loamy Sand (center)

Yellowish Brown
10YR5/6
Sandy Loam with Gravels
(sides and base)

**Artifacts**
500 (5.205 kg) Thermally Altered Stone
1 Projectile Point (#618-1, small contracting-stemmed)
1 Early Stage Biface
396 Flakes
14 Potlids
62 Chips
11 (0.075 kg) Unmodified Pebbles
2 (0.146kg) Unmodified Cobbles

**Ecofacts**
Total: .16g (2 l flotation)
3 Quercus sp. (white group) Charcoal
9 Unidentifiable Charcoal

**Radiocarbon Assay**
3860±40 BP (cal 2 σ BC 2464 to 2206 ;
Beta-149032)

**Description**
Feature 34 was identified within the E-horizon, bearing an elongated oval shape in opening plan. The profile of Feature 34 revealed steep sides, a rounded base with darker soil in the center, and a band of lighter soil along the sides and base of the feature. The differential soil color was the result of soil development rather than deposition. Over 900 artifacts were recovered from Feature 34, as detailed above.
Plan:

N227 +

N226 +

N225 +
E446

Profile:

A
N226.68
E446.28

line level 10.38 m amsl

A'
N225.32
E447.72

excavation surface

Profile:

A horizon

E horizon

B horizon

BC horizon

Feature 34

0          20         40cm
**Feature 38**

**Centerpoint**
N226.08/E442.80

<table>
<thead>
<tr>
<th><strong>Type</strong></th>
<th>B-2a: Basin</th>
</tr>
</thead>
</table>

**Morphology**
Plan: Oval  
Profile: Steep-Sided, Rounded Bottom

| **Elevation** | 10.05 m AMSL  
|              | (E horizon) |

| **Dimensions** | Length: 150 cm  
|                | Width: 75 cm  
|                | Depth: 80 cm  

<table>
<thead>
<tr>
<th><strong>Volume</strong></th>
<th>345.84 liters</th>
</tr>
</thead>
</table>

**Soil Classification**
Yellowish Brown  
10YR5/6  
Sandy Loam

<table>
<thead>
<tr>
<th><strong>Artifacts</strong></th>
<th>4 (0.034kg) Thermally Altered Stones; 7 Flakes; 4 Chips</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Ecofacts</strong></th>
<th>Not Collected</th>
</tr>
</thead>
</table>

**Radiocarbon Assay**  
Not Dated

**Description**
Feature 38 was initially identified at the transition of the E and B horizons in the eastern half of the unit. Subsequent bisection indicated that its origin was higher in the E horizon. The feature was oval in plan view and in profile, exhibited steep sides with a rounded bottom. Fill consisted of yellowish brown sandy loam and included a band of strong brown (7.5YR5/8) sand in the southwestern quarter of the feature. Artifact density was low.
Feature 39

Centerpoint
N226.11/E444.18

Type
B-2a: Basin

Morphology
Plan: Oval
Profile: Steep-Sided, Rounded Bottom

Elevation
10.03 m AMSL
(E horizon)

Dimensions
Length: 140 cm
Width: 80 cm
Depth: 72 cm
Volume: 309.33 liters

Soil Classification
Yellowish Brown
10YR5/6
Loamy Sand

Artifacts
1 (0.353 kg) Thermally Altered Stone
11 Flakes

Ecofacts
Total: 0.0 g (2 l flotation)
None Recovered from Flotation

Radiocarbon Assay
Not Dated

Description

Feature 39 was initially identified at the transition of the E and B horizons in the western half of the unit. Subsequent bisection indicated that its origin was higher in the E horizon. The feature was oval in plan view and in profile, exhibited steeply sloping sides with a rounded bottom. Fill consisted of yellowish brown loamy sand, similar to E-horizon soils. Artifact density was low.
**Feature 43**

**Centerpoint**  
N227.77/E444.10

**Type**  
B-1c: Basin

**Morphology**  
Plan: Oval  
Profile: Steep-Sided, Rounded Bottom

**Elevation**  
10.19 m AMSL  
(Top of E horizon)

**Dimensions** (as excavated)  
Length: 160 cm  
Width: 100 cm  
Depth: 58 cm  
Volume: 440.87 liters

**Soil Classification**  
Yellowish Brown  
10YR5/4  
Loamy Sand

**Artifacts**  
46 (3.162 kg) Thermally Altered Stones  
1 Projectile Point (#960-2, Poplar Island/Lackawaxen contracting-stemmed)  
1 Core  
108 Flakes; 77 Chips  
8 Potlids

**Ecofacts**  
Total: .07g (2 l flotation)  
1 Quercus sp. (white group)  
Charcoal

**Radiocarbon Assay**  
Not Dated

**Description**  
Feature 43 was identified at the base of the A horizon, 13 cm below ground surface. In plan view, the feature was an elongated oval. Thermally altered stones were clustered within the fill in the north central portion of the feature. Feature fill was homogenous, consisting of dark yellowish brown (10YR4/4) loamy sand. A rodent disturbance was noted in the center of the feature. Over 200 artifacts, detailed above, were recovered from Feature 43.
Plan:

Profile:

Key

Feature 43

contour interval 20 cm

approximate boundary
Feature 45

Centerpoint
N230.52/E443.28

Type
A-1c: Thermally Altered Stone

Morphology
Plan: Irregular
Profile: Uncoursed, Multi-level

Elevation
10.17 m AMSL
(Top of E horizon)

Dimensions
Length: 400 cm
Width: 250 cm
Depth: 10 cm

Soil Classification
Dark Yellowish Brown
10YR4/6
Loamy Sand
(E horizon)

Artifacts
226 (28.069 kg) Thermally Altered Stones
6 Flakes
1 Potlid
2 Cores

Ecofacts
Not Collected

Radiocarbon Assay
Not Dated

Description
Feature 45 consisted of a tight cluster of thermally altered stones with additional stones scattered up to two meters to the south and west of the main group. The feature was identified at the base of the A horizon. The central cluster consisted of two layers of stone, the sub-layer being of lower density. No basin or other evidence of excavation was observed associated with the feature. Thermally altered lithic materials included quartzite (65 percent), quartz (26 percent), jasper, and sandstone. Eighty-eight percent of the thermally altered stone assemblage consisted of fragmented stones. Non-thermally altered artifacts were recovered from the soil matrix. The image below shows the central cluster.
Thermally Altered Stone Feature Analysis and Interpretation

Six thermally altered stone features were documented within Block A. All of the features shared a similar depositional plane within the uppermost 10 cm level of the E horizon. The features consisted of concentrations of fragmented and unfragmented stones, and were divided into two general types: clusters (Features 1, 21, and 45), and scatters (Features 22, 23, and 26). Clusters were characterized as dense concentrations of stone in relatively undisturbed depositional contexts, while scatters consisted of lower density concentrations distributed on a single level.

To provide data for intrasite comparisons and for functional interpretations, several attributes were recorded for each feature, including mean fragment weight, horizontal area, artifact density (by count), fracture percentage, and lithic material frequency. Table 6-9 summarizes the dimensional and statistical attributes.

Table 6-9. Dimensional and Statistical Attributes of Thermally Altered Stone Features in Block A.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Count (n)</th>
<th>Weight (g)</th>
<th>Mean Weight (g)</th>
<th>Area (m²)</th>
<th>Density (n/m²)</th>
<th>Fracture %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>315</td>
<td>36,484.5</td>
<td>115.8</td>
<td>1.32</td>
<td>238.6</td>
<td>80%</td>
</tr>
<tr>
<td>21 cluster</td>
<td>135</td>
<td>8,076.6</td>
<td>59.8</td>
<td>0.45</td>
<td>300.0</td>
<td>100%</td>
</tr>
<tr>
<td>22</td>
<td>71</td>
<td>8,569.8</td>
<td>120.7</td>
<td>2.50</td>
<td>28.4</td>
<td>92%</td>
</tr>
<tr>
<td>23</td>
<td>141</td>
<td>11,904.4</td>
<td>84.4</td>
<td>10.00</td>
<td>14.1</td>
<td>98%</td>
</tr>
<tr>
<td>26</td>
<td>170</td>
<td>18,846.5</td>
<td>110.9</td>
<td>10.00</td>
<td>17.0</td>
<td>98%</td>
</tr>
<tr>
<td>45 cluster</td>
<td>160</td>
<td>21,801.6</td>
<td>136.3</td>
<td>1.30</td>
<td>123.1</td>
<td>88%</td>
</tr>
</tbody>
</table>

The density of thermally altered stone in each feature was calculated to quantify the relative degree of clustering of the stones, providing information concerning feature formation, as well as data for comparison against the general artifact distributions across the excavation block. The density figure was computed by dividing the total count of thermally altered stone fragments in each feature by the feature’s horizontal area. In some cases, the area used in the calculation did not reflect the product of the dimensions listed in the preceding descriptions. Most of the features had a few widely spread outlying fragments associated with them, yet varied in apparent density in their core areas. Like any statistical outliers, these fragments tended to dilute the density calculations by inflating the areas of the features. Therefore, while acknowledging the fact that the outliers have important implications for site formation analyses, they were discounted to better reflect the density of stone in the main depositional contexts of the features. The final entry in the table, fracture frequency, refers to the percentage of fragmented versus non-fragmented stone within each feature. As is evident from the high frequencies, there were few whole cobbles recovered from the features.

The following discussions summarize the attribute data for each feature and list some of the possible implications for feature function and formation. The inferences are very general and are based on established functional hypotheses and experimental data. For example, studies have indicated that high temperatures and long-term exposure to heat are typically required to fracture most types of stone. Reuse increases the rate of fracture, as does rapid cooling by immersion in liquid (Cavallo 1987; Custer and Silber 1995). Thus, the presence of unfractured stones in a feature may indicate limited use, while many large fragments may be
evidence of recycled stone, suggesting repeated use or the scavenging of used stone from older features. Small, highly fragmented stones may be an indication of high temperature and rapid cooling, such as is associated with the production of steam or with indirect boiling (stone-boiling). Dense artifact clustering in a feature, along with the presence of refitted stone fragments, may indicate a primary context with little disturbance. A scattered distribution, in contrast, might indicate secondary deposition (a discard area) or extensive postdepositional disturbance. Since each attribute may obviously have several possible interpretations, the discussions present a range of implications, not specific functions or formation processes.

**Feature 1**

<table>
<thead>
<tr>
<th>attributes</th>
<th>implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>dense cluster on a single plane</td>
<td>primary context, little disturbance</td>
</tr>
<tr>
<td>mean weight: 115.8 g, higher than</td>
<td>use of recycled stone</td>
</tr>
<tr>
<td>surrounding sediments</td>
<td></td>
</tr>
<tr>
<td>fracture frequency: 80%</td>
<td>high temperatures, repeated or</td>
</tr>
<tr>
<td></td>
<td>prolonged use</td>
</tr>
</tbody>
</table>

**Interpretation of function/formation:**

Feature 1 was dense, sub-round cluster resting on a single plane, suggesting that its context was relatively undisturbed. The feature was comprised of both large, fractured stones, indicating prolonged and/or repeated exposure to high temperatures, and whole stones (20% of the total), suggesting lower temperatures or short-term exposure to heat. Together these characteristics suggested that the feature was at or near its original location and that the larger fragments had been recycled. The spatial proximity of Feature 1 to Feature 9, a pit feature immediately to southeast, as well as similarities between the artifacts in the two proveniences, suggested that the stones may have been removed from processing activity in the pit.

**Feature 21**

<table>
<thead>
<tr>
<th>attributes</th>
<th>implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>dense cluster (300 stones/m²) with associated planar scatter</td>
<td>primary context, with some, limited disturbance</td>
</tr>
<tr>
<td>mean weight within cluster: 59.8 g, lowest among sample, higher than surrounding sediments</td>
<td>small stone size, selective recycling</td>
</tr>
<tr>
<td>fracture frequency within cluster: 100%</td>
<td>high temperatures, repeated or prolonged use, rapid cooling</td>
</tr>
</tbody>
</table>

**Interpretation of function/formation:**

Feature 21 was a large feature covering over three square meters. There was a dense cluster of highly fragmented stones at the center of the concentration and an outlying scatter up to one meter to the east and west that may have resulted from postdepositional dispersal through scavenging, trampling, or bioturbation. The high degree of fragmentation indicated intense heat and possibly rapid cooling involved with steaming. The low mean weight of the
fragments could indicate the selection of small stones or recycled fragments for stone-boiling within a container.

**Feature 22**

<table>
<thead>
<tr>
<th>attributes</th>
<th>implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>scattered stone, majority on a single plane,</td>
<td>disturbed, discard area</td>
</tr>
<tr>
<td>relatively low density: 28.4 stones/m²</td>
<td></td>
</tr>
<tr>
<td>mean weight: 120.7 g, slightly higher than other</td>
<td>scavenging, recycling</td>
</tr>
<tr>
<td>features in the sample</td>
<td></td>
</tr>
<tr>
<td>fracture frequency: 92%</td>
<td>high temperatures, repeated or prolonged use, rapid冷却</td>
</tr>
</tbody>
</table>

**Interpretation of function/formation:**

Feature 22 was a linear scatter of relatively large fragments spread over a wide area (up to 2.5 m). The stones exhibited a high frequency of fracture indicating prolonged or intense heat. Given the dispersed context, the original function or use of the stones was unclear. Their current distribution may have been the result of discard, scavenging associated with nearby stone clusters (Features 21 and 45), or other post-depositional processes.

**Feature 23**

<table>
<thead>
<tr>
<th>attributes</th>
<th>implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>large scatter on a single plane, low density:</td>
<td>disturbed, discard area</td>
</tr>
<tr>
<td>14.1 stones/m²</td>
<td></td>
</tr>
<tr>
<td>mean weight: 84.4 g, higher than surrounding</td>
<td>small fragments</td>
</tr>
<tr>
<td>sediments</td>
<td></td>
</tr>
<tr>
<td>fracture frequency: 98%</td>
<td>high temperatures, repeated or prolonged use, rapid冷却</td>
</tr>
</tbody>
</table>

**Interpretation of function/formation:**

Feature 23 was a low-density scatter covering a 10-m² area. The fragments were highly fractured, indicating prolonged exposure to high temperatures and/or rapid cooling. The stones were similar in size those in Feature 21, that was located less than one meter to the north, and may have resulted from a similar selection of small stones or recycled fragments. Their distribution suggested intentional discard or postdepositional disturbances, such as trampling or scavenging.

**Feature 26**

<table>
<thead>
<tr>
<th>attributes</th>
<th>implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>large scatter across a single plane, tree roots</td>
<td>disturbed context, discard area</td>
</tr>
<tr>
<td>present throughout</td>
<td></td>
</tr>
<tr>
<td>mean weight: 110.9 g, similar to other features</td>
<td>scavenging, recycling</td>
</tr>
<tr>
<td>in the sample</td>
<td></td>
</tr>
<tr>
<td>fracture frequency: 98%</td>
<td>high temperatures, repeated or prolonged use, rapid冷却</td>
</tr>
</tbody>
</table>

3-94
**Interpretation of function/formation:**

Feature 26 was a large, low-density scatter covering 10 square meters. Tree roots present within the feature boundaries indicated postdepositional disturbance, although discard may have been the primary factor in the dispersed morphology. The high degree of fragmentation indicated prolonged exposure to heat and/or rapid cooling, and possibly, extensive recycling. Approximately 20 percent of the stones were refitted in a non-systematic process during the course of cataloging. While not the results of a formal study, the refits suggested that the stones had fractured in place, possibly along existing fracture lines that separated during or following discard.

**Feature 45**

<table>
<thead>
<tr>
<th>attributes</th>
<th>implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>dense cluster with associated planar scatter</td>
<td>primary context, with some, limited disturbance</td>
</tr>
<tr>
<td>mean weight: 111.8 g, higher than surrounding sediments</td>
<td>scavenging, recycling</td>
</tr>
<tr>
<td>fracture frequency: 88%</td>
<td>high temperatures, repeated or prolonged use, rapid cooling</td>
</tr>
</tbody>
</table>

**Interpretation of function/formation:**

Feature 45 was a large feature covering approximately eight square meters. A dense cluster up to 15 cm deep was located in the northeastern portion of the concentration suggesting that the scattered, outlying stones had resulted from postdepositional disturbance of the cluster, possibly through contemporary sorting and discard. The high degree of fragmentation indicated exposure to high temperatures, possibly repeated, suggesting recycling.

**Pit Feature Analysis and Interpretation**

Stratigraphic analyses, presented in the Spatial Analysis section below, suggested that with the exception of Feature 9, the pit features in Block A pre-dated the thermally altered stone features identified in the first level of the E horizon. Similarly, the pits post-dated the occupations represented by the artifacts in the lower levels of the E horizon, through which the features had been excavated. Their contemporaneity could not be established with any greater precision. Yet, they appeared to represent one occupation or a series of related occupations, and for this reason, they are treated together as a group in the following descriptive analyses.

**Dimensional Attributes**

The pit features documented in Block A consisted of large and small basins, most of which exhibited similar shapes in plan and profile: they were generally oval in plan view, as recorded when first recognized against the background of the E horizon sediments; they were deep in relation to the diameter of the opening; and they displayed sloping sides and rounded bases. Table 6-10 summarizes the dimensional attributes of the features.
Table 6-10. Dimensional Attributes of Pit Features in Block A.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Length (cm)</th>
<th>Width (cm)</th>
<th>Depth (cm)</th>
<th>L:W</th>
<th>Ratio depth</th>
<th>Volume (l)</th>
<th>Artifact Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>240</td>
<td>140</td>
<td>86</td>
<td>1.7</td>
<td>2.2</td>
<td>1,097.24</td>
<td>0.50</td>
</tr>
<tr>
<td>9</td>
<td>200</td>
<td>140</td>
<td>84</td>
<td>1.4</td>
<td>2.0</td>
<td>894.14</td>
<td>0.09</td>
</tr>
<tr>
<td>34</td>
<td>220</td>
<td>108</td>
<td>85</td>
<td>2.0</td>
<td>1.9</td>
<td>768.94</td>
<td>1.28</td>
</tr>
<tr>
<td>38</td>
<td>150</td>
<td>75</td>
<td>80</td>
<td>2.0</td>
<td>1.4</td>
<td>345.84</td>
<td>0.04</td>
</tr>
<tr>
<td>39</td>
<td>140</td>
<td>80</td>
<td>72</td>
<td>1.8</td>
<td>1.5</td>
<td>309.33</td>
<td>0.04</td>
</tr>
<tr>
<td>43</td>
<td>160</td>
<td>100</td>
<td>58</td>
<td>1.6</td>
<td>2.2</td>
<td>448.10</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Most of the features had openings measuring 1-to-1.5 m in width and 1.5-to-2.5 m in length. Depths were more consistent, most ranging between 75 and 85 cm. Length:width ratios were calculated from the dimensional data to describe the shapes of the feature openings—a ratio of 1.0 depicts a circular opening, with length and width equal, while a ratio of 2.0 describes an ellipse that is twice as long as it is wide. The ratios of the pit features in Block A varied from 1.5 to 2.2, indicating a series of distinctly oval shapes.

Another statistic, the ratio depth, provided a standardized means of describing the relative depths of the features (Hatch and Stevenson 1980). The ratio depth statistic was computed as the average dimension of the feature opening divided by its depth:

\[
\frac{(L+W)/2}{D}
\]

The larger the resulting figure, the shallower the depth in relation to the size of the opening. Ratio depths below 5.0 are comparatively deep in appearance (Hatch and Stevenson 1980; Knepper and Petraglia 1993). The figures calculated for the pit features in Block A ranged from 1.4 to 2.2.

Feature volume provided an additional measure of size for comparative purposes. Volumes were determined using a standard geometric formula for a section of an ellipsoid, or elongated sphere:

\[
V=0.67\pi(a*b*D)
\]

Where \(a\)=one-half the maximum length and \(b\)=one-half the maximum length. The calculation supposes that the features were regular in shape, on the assumption that if the pits were indeed cultural in origin, they would not be grossly amorphous. Feature volumes in Block A ranged from just over 300 liters to nearly 1,100 liters, with an average of almost 650 liters.

Also included in the table was a measure of artifact density, shown in the number of artifacts per liter of volume. The figure displayed a wide variation, indicating very low density in some cases, 0.04 artifact per liter, and substantially higher in others, 1.28 per liter. As observed in the analysis of feature contexts, detailed in Appendix K, artifact density in the pit features was often directly related to the density of artifacts in the surrounding sediments, which bore implications for assessing abandonment and infilling processes.
The attribute data for each feature are considered below in terms of their implications for formation, function, and infilling. Particle size and geochemical data that are cited are detailed in the Geoarchaeological Study in Appendix H.

Formation and Functional Analyses

Feature 7
Feature 7 was a large pit feature. It was recognized archaeologically in the E horizon, at an average elevation of 9.92 m amsl. The side walls of the pit were very steep, flaring slightly near the opening. Feature fill was described as a dark yellowish brown (10YR4/6) loamy sand that was uniform in texture, with no evidence of stratification. A layer of lighter colored sandy loam occurred along the sides and base of the feature suggesting the initial development of an eluviated or E horizon at the transition from the pit to the undisturbed sediment matrix. Particle size analysis noted a higher proportion of fines within the fill in comparison with the surrounding matrix, suggesting that the sediments had been sorted during a relatively slow depositional mechanism such as erosion.

The fill in Feature 7 contained 557 artifacts, including 176 thermally altered stone fragments and 378 chipped stone artifacts. Artifact density was relatively high for pit features in the excavation block, at 0.50 artifacts per liter. Approximately one-third of the artifacts recovered from Feature 7 were not provenienced by level, as a result of a trench excavated across part of one of the units containing the feature (N229/E446) during an early phase of fieldwork. The upper 30 cm of the feature profile in this unit was affected. In order to maintain as large a sample as possible for the frequency distribution analysis below, the artifacts were assumed to have been distributed throughout the first three levels of the feature in proportions equal to those in the same levels of the feature in surrounding units.

As indicated in Figure 6-15, the majority of the artifacts—over 70 percent of the chipped stone and over 80 percent of the thermally altered stone—were recovered from the first three levels of feature fill. There was a steady fall-off of both artifact types with depth. The results of contextual analysis of the feature, detailed in Appendix K, indicated that artifacts in the pit fill were smaller than those in the surrounding sediments. There were differences in the proportions of artifact type and raw materials in the two proveniences, but these differences could generally be attributed to the fact that the excavation units surrounding the feature contained several thermally altered stone features that influenced the artifact frequency data. Overall, the fill did not appear to have been related to the primary function of the pit feature, and thus there was no evidence from the
contents as to its use. Based solely on the shape of the pit, with deep, steeply sloped sidewalls, the original function may have been connected with storage. Infilling appeared to have been slow, probably through the erosion of surface deposits following abandonment of the feature, with small artifacts incidentally included.

**Feature 9**

Feature 9 was a large, oval basin identified at the base of the A horizon, at an average depth of 9.63 m amsl. While several rodent disturbances were documented within the feature and in the surrounding units, the original shape of the basin was still apparent, showing sloping sides and a wide, slightly rounded base. Particle size analysis indicated that the fill contained less sand and more silt than was present in the surrounding matrix, suggesting erosion as a depositional mechanism.

Feature 9 contained relatively few artifacts: a total of 80, including 38 chipped stone artifacts and 42 thermally altered stone fragments. The low frequencies were reflected in an artifact density calculation of 0.09 artifacts per liter. As indicated in Figure 6-16, over 80 percent of both the chipped stone and thermally altered stone fragments were located in the first three 10-cm levels of feature fill, but overall the frequencies were not correlated with depth. Nearly 40 percent of the chipped stone artifacts and over 50 percent of the thermally altered stone fragments occurred in the third excavation level. Sample sizes were small, affecting the confidence of interpretations, but the data suggested that infilling did not occur at a regular rate, and thus may have included a combination of cultural and natural agents.

*Figure 6-16. Artifact Frequency Distribution by Depth in Feature 9.*

Feature 9 occurred on a level with the thermally altered stone concentration, Feature 1. Based on artifact similarities between the two features, detailed in Appendix K, it appeared that they were contemporary and may have been part of a functional unit. The thermally altered stone fragments comprising Feature 1 appeared to have been heated rock removed from the pit. The nature of the activity involving the features remains unclear. They may have been used in some form of processing, in which the pit, Feature 9, was lined and heated stones were introduced to heat the contents of the pit. Feature 1 may have been the remnants of the fire used to heat the rock, or it may have been material that was cleaned out of the pit. Alternatively, the features may have had a less utilitarian function, possibly related to ceremony or ritual, although there was no direct evidence of this form of activity.
Feature 34
Feature 34 was a large and deep pit feature, oval in plan, and identified within the E horizon, where the opening was located at an average elevation of 10.12 m amsl. The side walls were very steep at one end (northeast), and more markedly sloped at the other (southwest). Fill consisted of dark yellowish brown (10YR4/6) loamy sand, with little evidence of internal stratigraphy. As with Feature 7, a layer of lighter colored sandy loam along the sides and base of the feature suggested the formation of an eluviated or E horizon at the transition to the undisturbed sediments surrounding the pit. Particle size analysis indicated a higher proportion of fines in the feature fill than in the surrounding sediments. The percentage of organic material in the fill was the same as that recorded in a control column sampled in a part of the site without pit features and with less evidence of activity overall. Likewise, the levels of chemicals often associated with cultural activity—calcium, magnesium, and potassium—were at or slightly below the levels in the control sample. Phosphorus levels were slightly higher than in the control sample.

The feature fill contained 987 artifacts, resulting in the highest artifact density among the pit features in Block A: 1.28 artifacts per liter. The artifacts included 487 pieces of chipped stone and 500 fragments of thermally altered stone. Both artifact types occurred in decreasing frequency with depth (Figure 6-17), with 75 percent of both types recovered from the first two 10-cm excavation levels of the fill. The results of a comparative analysis of the feature and the surrounding sediments, detailed in Appendix K, indicated that the artifacts in the basin were similar in type and raw material distribution to artifacts in the sediments, but were smaller in size. Differences were noted in the proportions of raw materials among thermally altered stone fragments, but indications were that the variation may have been related to artifact size.

![Artifact Frequency Distribution by Depth in Feature 34.](image)

Analysis of the sediments and artifacts in the fill suggested that Feature 34 did not contain evidence directly related to the original function of the pit. Instead, the fill appeared to have been secondary, probably the result of slow infilling through the gradual erosion of surface deposits. The generally small sizes of the artifacts in the feature suggested that they were incidental inclusions.

Feature 38
Feature 38 was a small pit feature that was oval in shape at its opening, where it was initially recognized in E horizon sediments at an average elevation of 10.05 m amsl. The side walls were for the most part steeply sloped, and were almost vertical along the southern side of the feature. Of the pit features in Block A, Feature 38 was the deepest relative to its diameter, with a ratio depth of 1.4. There was no obvious stratification present in the sediments making up the fill.
As in most of the pit features in Block A, the fill contained a higher proportion of fines than was observed in the surrounding sediment matrix, while organic matter and chemical analyses indicated levels at or below those of the control sample.

The sediment layers surrounding the feature contained a large number of artifacts, as detailed in Appendix K. In contrast, few artifacts occurred in the fill: 0.04 artifacts per liter. Because of the small sample of material in the pit, it was not possible to determine whether the artifacts were directly related to the material in the surrounding sediment matrix. The artifacts were not evenly distributed throughout the levels of the fill (Table 6-11). The artifact frequency data implied that infilling occurred quickly, either as a single event or in several distinct episodes. The activity may have been purposeful, with relatively sterile sediments that were originally removed from the deep excavation of the feature used as fill. The fill appeared to have been secondary, and there was no direct evidence from it of the original function of the pit. Based on its depth and the steepness of the side walls, the feature may have served as a storage container.

<table>
<thead>
<tr>
<th>excavation level</th>
<th>chipped stone</th>
<th>thermally altered stone</th>
<th>total by level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>--</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>--</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>--</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>total by type</td>
<td>11</td>
<td>4</td>
<td>15</td>
</tr>
</tbody>
</table>

**Feature 39**

Feature 39 was a small, oval pit, similar to Feature 38 in shape and contents. The dimensions of the horizontal axes were similar to those of Feature 38, as was the depth and thus the relative depth, as calculated in the ratio depth of 1.5. Feature 39 was identified within the E horizon, at an average elevation of 10.03 m amsl. The walls of the feature were steeply sloped, with the walls on the north side nearly vertical. There was no evidence of stratification in the sediments comprising the fill. Particle size analysis indicated that the fill contained a higher proportion of silt than did the surrounding sediment matrix, while organic matter and chemical analyses indicated levels at or below those of the control sample.

There were few artifacts in the fill, and none in the lowest levels (Table 6-12). Artifact density was calculated as 0.04 artifacts per liter. In contrast to the feature fill, the sediment layers surrounding the feature contained a large number of artifacts, as detailed in Appendix K. Determining the relationship between the artifacts in the pit and in the surrounding sediment matrix was not practical, again due to the small number of artifacts in the feature. Nevertheless, given the similarities between Feature 39 and Feature 38, the inferences drawn about the infilling of Feature 38 may apply to Feature 39. That is, infilling probably occurred quickly, as a purposeful activity, using relatively sterile sediments from the deep excavation of the feature. The fill thus appeared to have been secondary, and there was no direct evidence of the original function of the pit.
Feature 43
Feature 43 was a deep, oval shaped pit that was initially recorded in the E horizon, immediately below the transition from the A horizon, at an average elevation of 10.91 m amsl. The walls of the feature were very steeply sloped, although the pit was elongated and more moderately sloped to the north and northeast. The base of the pit was rounded. A cluster of thermally altered stone fragments occurred on the surface of the feature. Analysis of the stone in relation to the contents of Feature 43, detailed in Appendix K, suggested that the fragments formed a separate deposit from the artifacts in the pit, possibly the base of a small cluster of thermally altered stones that originally were located near the base of the A horizon. There was no evidence of stratified sediments in Feature 43, but as was the case with all of the pit features in Block A, the proportion of fine, silty sediment was greater than in the surrounding soil matrix through which the feature had been excavated. Organic matter and chemical analyses indicated levels at or below those of the control sample, although phosphorus levels were slightly higher.

In contrast to Features 38 and 39, that were located directly to the south and contained very few artifacts, there were 228 artifacts in the fill excavated from Feature 43. Artifact density was calculated as 0.51 artifacts per liter. Over 80 percent of the artifacts consisted of chipped stone debris. The vertical distribution of the 195 chipped stone artifacts showed a gradual fall-off in frequency with depth (Figure 6-18). Thermally altered stone fragments were less evenly distributed, with most of the total of 33 fragments occurring in the first two levels of the fill (note that relative frequencies are displayed in the chart, not count data).

**Figure 6-18. Artifact Frequency Distribution by Depth in Feature 43.**

The results of contextual analysis, detailed in Appendix K, implied that the artifacts in Feature 43 were probably related to the artifacts in the surrounding sediments. Differences in the proportions of artifact types—chipped vs. thermally altered stone—could be attributed to the fact that the excavation units surrounding the feature contained material from the nearby thermally altered stone cluster, Feature 45 that influenced the artifact frequency data. Raw material frequencies were similar in the two proveniences, but the artifacts in the feature were smaller than those in the sediments. In the end, the fill did

---

**Table 6-12. Artifact Frequency Distribution by Depth in Feature 39.**

<table>
<thead>
<tr>
<th>excavation level</th>
<th>chipped stone</th>
<th>thermally altered stone</th>
<th>total by level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>--</td>
<td>3</td>
</tr>
<tr>
<td>total by type</td>
<td>11</td>
<td>1</td>
<td>12</td>
</tr>
</tbody>
</table>
not appear related to the primary function of the pit feature, and thus there was no evidence from the contents as to its use. Based on the shape of the pit alone, the original function may have been connected with storage. Infilling appeared to have been slow, probably through the erosion of surface deposits following the abandonment of the feature, with artifact inclusion incidental in frequency with depth (Figure 6-18). Thermally altered stone fragments were less evenly distributed, with most of the total of 33 fragments occurring in the first two levels of the fill (note that relative frequencies are displayed in the chart, not count data).

The results of contextual analysis, detailed in Appendix K, implied that the artifacts in Feature 43 were probably related to the artifacts in the surrounding sediments. Differences in the proportions of artifact types—chipped vs. thermally altered stone—could be attributed to the fact that the excavation units surrounding the feature contained material from the nearby thermally altered stone cluster, Feature 45 that influenced the artifact frequency data. Raw material frequencies were similar in the two proveniences, but the artifacts in the feature were smaller than those in the sediments. In the end, the fill did not appear related to the primary function of the pit feature, and thus there was no evidence from the contents as to its use. Based on the shape of the pit alone, the original function may have been connected with storage. Infilling appeared to have been slow, probably through the erosion of surface deposits following the abandonment of the feature, with artifact inclusion incidental.

**Geochemical Analysis**

Twelve samples of possible cultural sediment from the 7NC-J-228 were selected for laboratory analysis, along with seven control samples (Table 6-13). Prior to analysis, five of the 7NC-J-228 specimens sampled were determined to be products of floral, faunal, and other disturbance processes that had contributed to the formation of the site. These samples were also run to provide a measure of verification of the geochemical methods applied to the entire sample population. The archeological interpretations were corroborated by the present independent analysis of cultural sediments. Tripartite grain-size distributions, soil pH, organic matter, available P, exchangeable Ca, Mg, and K, and citrate-dithionite extractable Fe were analyzed for all of samples.

**Table 6-13. Possible Cultural Sediments from 7NC-J-228 Selected for Sedimentological and Geochemical Analysis.**

<table>
<thead>
<tr>
<th>Site</th>
<th>Feature</th>
<th>North</th>
<th>East</th>
<th>Collected by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7NC-J-228</td>
<td>1</td>
<td>N234.4</td>
<td>E450.4</td>
<td>Parsons</td>
</tr>
<tr>
<td>7NC-J-228</td>
<td>3</td>
<td>N230</td>
<td>E446</td>
<td>GRA</td>
</tr>
<tr>
<td>7NC-J-228</td>
<td>3</td>
<td>N230</td>
<td>E446</td>
<td>GRA</td>
</tr>
<tr>
<td>7NC-J-228</td>
<td>7</td>
<td>N229</td>
<td>E446</td>
<td>Parsons</td>
</tr>
<tr>
<td>7NC-J-228</td>
<td>8</td>
<td>N230</td>
<td>E445</td>
<td>GRA</td>
</tr>
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<td>E451</td>
<td>Parsons</td>
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<td>N220</td>
<td>E455</td>
<td>GRA</td>
</tr>
<tr>
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<td>N226</td>
<td>E443</td>
<td>Parsons</td>
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<tr>
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<td>39</td>
<td>N226</td>
<td>E444</td>
<td>GRA</td>
</tr>
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<td>N228</td>
<td>E448</td>
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<tr>
<td>7NC-J-228</td>
<td>45</td>
<td>N230</td>
<td>E443</td>
<td>Parsons</td>
</tr>
</tbody>
</table>

1archaeological analyses: determined non-cultural
The suite of samples from 7NC-J-228 was variable in terms of texture and organic enrichment (Figure 6-19).

Perhaps the most significant result of the geochemical analyses was the successful discrimination of contexts which were independently determined to result from biogenic disturbance at 7NC-J-228. The samples from contexts designated as Features 1, 3-IV, 3-V, 8, 12, and 45 were depleted in exchangeable K, Ca, and Mg as well as in total phosphate (Figure 6-20) compared to the samples of cultural sediment from Features 7, 13, 34, 38, 39, and 43. The samples from Features 38 and 39 were particularly enriched in all of the cations measured while Feature 13 was nearly as depleted as several of the samples from non-cultural contexts. The abundance of potassium showed a nearly linear relationship to the abundance of silt and clay similar to that shown for phosphate in Figure 6-21.
Figure 6-20. Comparison of the Chemistry of Sediments Analyzed for Five Non-Cultural (disturbed) Contexts and Seven Prehistoric Features from 7NC-J-228.

Figure 6-21. Bivariate Plot of the Percent Silt + Clay vs. Available Phosphate for Samples of Possible Cultural Sediment from the Sandom Branch Site Complex. (Samples from 7NC-J-228 Not Circed)
The sediments from the control contexts were coarser textured and depleted in total phosphate compared to the samples from prehistoric cultural features. The total phosphate is the sum of the phosphate fractions shown in Figure 6-x4 on a ternary plot. The plot shows the same overlap of fields for cultural and non-cultural sediments seen in the other geochemical analyses. At 7NC-J-228, the high amounts of Fraction II phosphate (Figure 6-22) may be partly due to the fact that these features were from an earlier cultural period. Fraction II is taken as an indicator of time (Eidt 1977; Schuldenrein 1995), and the amounts of Fraction II, the Fe- and Al-occluded phosphates, tend to increase as sediment weathers. Another plausible hypothesis is that the sediments with the highest Fraction II loadings came from pits excavated deep enough to include material from the buried soil underlying the archeological contexts. Fills from deep Early Woodland pits can thus be hypothesized to have high amounts of Fraction II phosphate as well as exchangeable Ca, Mg, and K. The relatively low amounts of organic matter in the 7NC-J-228 pit fills did not suggest stored food or refuse from dwellings. Rather, the pits may have filled gradually after the site was abandoned.

Spatial Analyses

The analyses reported in this section addressed site formation issues from the perspective of stratigraphy. Vertical and horizontal contexts were assessed to determine whether distinct cultural strata could be recognized within the general distribution of artifacts in Block A.
Vertical artifact distributions were analyzed for implications regarding the separation of temporal components. Horizontal distributions were examined for similar temporal patterning, as well as for information about functional variation apparent within the structure of the site.

**Vertical Frequency Distributions**

The vertical distribution of all prehistoric artifacts from Block A was plotted by excavation level to determine whether there might be clustering at specific depths that would indicate particular depositional episodes or groups of roughly contemporary episodes. The presence of features in the profile added complexity to the accurate calculation of artifact frequencies, and the methods used to deal with them in the analyses require explanation. Pit or basin features often contain artifacts, the vertical positions of which are not necessarily related to the surrounding sediments. That is, pit features have been excavated into sediments below their contemporary occupational surface, and thus any artifacts contained in the feature fill are intrusive to those sediments. For this reason, artifacts from excavated features—basins or pits—were excluded from the frequency distribution computations in the present analyses. In contrast, surface features, such as the thermally altered stone clusters in Block A, represent artifacts that may be contemporary with other artifacts in the stratum in which they were found. Unlike pit features, the surface features were not intrusive, and thus they contribute to the general artifact frequency in the stratum. And so, in the current analyses, all of the heated rock fragments from the thermally altered stone clusters were included in the artifact counts for the sediment deposits in which they occurred.

Figure 6-23 presents a bar chart illustrating the frequency of occurrence of all prehistoric artifacts in Block A with depth, excluding artifacts in pit features. The curve had a single peak, reaching a maximum in the first level of the E horizon. A second, minor peak was evident in the first level of the B horizon, but this peak did not reflect an actual jump in artifact frequency between the layers. Rather, it was the result of the uneven, undulating base of the E horizon and the combining of several incomplete levels from that deposit.

**Figure 6-23. Artifact Frequency Distribution with Depth, Block A.**

The unimodal shape of the artifact distribution in Block A can be interpreted in one of several ways: as evidence of a single, relatively short span of site use; as a continuous series of deposits representing occupations spanning a longer period of time; or as a variety of separate deposits that have been intermixed postdepositionally. Further investigation of these alternative interpretations involved analyses that examined the horizontal relationships between the artifacts in the various strata.
Horizontal Distributions

Spatial analyses were conducted on horizontal provenience data from the A horizon and E horizon, using artifact counts from the 1-m² excavation units. The results were displayed as contour maps of relative artifact density across the block excavation (Figures 6-24, 6-25). While there was a degree of variation in the density of the distributions in some sections of the block, the overall pattern depicted by the analyses was the same in the A and E horizons (note that the polygons surrounding major artifact concentrations on the map were impressionistic, and not statistically derived).

The burned rock fragments from the thermally altered stone features were included in the frequency data used in the analysis, as they were earlier in the vertical distribution analysis, and the locations of the features were clearly apparent in the artifact concentrations depicted in the E horizon. The feature locations were also evident in the A horizon distributions, as can be seen in Figure 6-26, in which feature boundaries have been drawn over the A horizon artifact distribution. A considerable amount of material from the features thus appeared to be included in the surface layer, implying that the features originally were located at or slightly above their mapped locations in the E horizon. There had been sufficient disturbance to spread the material higher in the profile, into the A horizon, yet there appeared to have been limited horizontal spreading, so that the feature locations were still apparent in that stratum.

Figure 6-24. Spatial Analysis of Artifact Density, A Horizon, Block A.
(major concentrations are circled)
Figure 6-25. Spatial Analysis of Artifact Density, E Horizon, Block A.
(major concentrations are circled)

Figure 6-26. Artifact Density in A Horizon and Feature Location, Block A.
(features are represented by the cross-hatched polygons)
While the overall pattern of artifact distribution in the A and E horizons was similar, differences were apparent in specific portions of Block A—there were more artifacts in the E horizon in the northeast part of the block, north of Feature 1, for example, and fewer in the southwest corner of the block. To investigate the source of the variation, the artifact distributions were further broken down by major artifact type, with spatial analyses conducted on flaking debris and thermally altered stone artifacts in each deposit.

As illustrated in Figures 6-27, 6-28, artifacts grouped by major type exhibited similar clustering in both the A and E horizons. Concentrations of flaking debris occurring in the A horizon, for example, were for the most part visible in the E horizon. The same was true for thermally altered stone fragments, although there were fewer fragments in the E horizon along the western edge of the block. Otherwise, the pattern of similar A and E horizon distributions was mirrored in the distributions of each artifact group, suggesting that the soil horizon break was not correlated with the artifact distributions. There were, though, distinct variations between the flaking debris and thermally altered stone fragment distributions within each horizon, particularly in the E horizon—the concentrations noted earlier in the northeast and southwest parts of the block, for example, appeared to consist almost entirely of flaking debris. This distinctive patterning, along with the presence of the relatively undisturbed burned rock features in the E horizon, indicated that artifact assemblages in portions of the excavation block had not been entirely intermixed. And thus, while little potential existed for identifying individual components vertically, there was potential for identifying and assessing specific activity areas.
Component Separation

Chronological data were ambiguous in terms of delineating specific cultural components, whether vertically or horizontally. Both the A and E horizons contained mixtures of Archaic and Woodland period diagnostic artifacts, as detailed in Table 6-14, but in insufficient numbers to establish statistical trends. Absolute dates posed similar difficulties in interpretation. All of the dates obtained from the block were AMS assays on very small samples—either small charcoal flecks or humic acids from bulk sediments—and there were attendant problems with establishing depositional contexts. Two dates were obtained from bulk samples that represent sediments cut into by Feature 7 and Feature 34, producing assays of $3190 \pm 60$ BP (cal 2 $\sigma$ BC 1615 to 1317; Beta-149040) and $2270 \pm 40$ BP (cal 2 $\sigma$ BC 400 to 207; Beta-149042). The two pit features, Feature 7 and Feature 34, that cut into these sediments yielded dates on charcoal fragments that were earlier than the sediment dates—$3770 \pm 40$ BP (cal 2 $\sigma$ BC 2334 to 2037; Beta-149039) for Feature 7 and $3860 \pm 40$ BP (cal 2 $\sigma$ BC 2464 to 2206) (Beta 149032) for Feature 34—opposite to the relationship expected for intrusive features. The AMS assays from Feature 7 and Feature 34 are statistically identical and produced a mean pooled age of $3815 \pm 28$ BP (cal 2 $\sigma$ BC 2401 to BC 2143). The wide disparity in the bulk sediment dates with respect to each other and the feature dates suggests that the bulk sediment dates are not valid. The evidence from diagnostic artifacts occurring in the features was not clear-cut. A small, contracting-stemmed point from the early portions of the Woodland period occurred at the top of Feature 34. Feature 7 contained three points: #523-1, a small, proximal fragment (from Level 2), that was untyped and thus was difficult to interpret in terms of age; #525-1, a small, contracting-stemmed point (Level 4), also of uncertain age; and #500-1, a small, untyped point (Level 5), that, while damaged and reworked, appeared to have been Archaic in date.

In summary, the temporal data from Block A were unclear. A single cultural stratum was present situated within the lower portion of the A horizon and the upper portion of the E
horizon. Artifacts in the deposit had dates spanning the end of the Late Archaic period through the early half of the Woodland period. Yet the artifacts were housed in a narrow band of sediments 20-30 cm in thickness with enough variation in depth relative to age to call into question the ability to separate non-diagnostic artifacts by temporal period. To determine whether additional evidence for distinct occupational zones might be present, the relative positions of the features recorded in the block were examined in detail.

Table 6-14. Chronologically Diagnostic Artifacts in the Two Major Sediment Horizons, Block A.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Artifact</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ao</td>
<td>2 triangle points</td>
<td>Late Woodland</td>
</tr>
<tr>
<td></td>
<td>1 Rossville/Piscataway point</td>
<td>Early/Middle Woodland</td>
</tr>
<tr>
<td></td>
<td>1 Woodland I stemmed point</td>
<td>Early/Middle Woodland</td>
</tr>
<tr>
<td></td>
<td>1 Lackawaxen point</td>
<td>Late Archaic/Early Woodland</td>
</tr>
<tr>
<td>E</td>
<td>2 Rossville/Piscataway points</td>
<td>Early/Middle Woodland</td>
</tr>
<tr>
<td></td>
<td>1 Woodland I stemmed</td>
<td>Early/Middle Woodland</td>
</tr>
<tr>
<td></td>
<td>1 Marcey Creek ceramic sherd</td>
<td>Early Woodland</td>
</tr>
<tr>
<td></td>
<td>1 Lackawaxen point</td>
<td>Late Archaic/Early Woodland</td>
</tr>
<tr>
<td></td>
<td>1 Lamoka point</td>
<td>Late Archaic</td>
</tr>
</tbody>
</table>

Two main feature types were identified in the excavations: basin features that had been excavated into the soil profile; and, thermally altered stone concentrations that were horizontally distributed and deposited on level planes. The elevations of the uppermost levels of the thermally altered stone features were plotted against a model of sediment depth within the block, represented by simplified profile sections. Two distinct groups were apparent, distinguished by their relationships to the southward slope of the sediments. Two features, Feature 1 and Feature 26, were recorded in the north part of the block located at the same level—4 cm separated their recorded elevations. In the southern part of the block, five features—Features 21, 22, 23, 43, and 45—occurred within a vertical range of 18 cm (Figure 6-29).

Figure 6-29. Relative Elevations of Thermally Altered Stone Features in Southern Part of Block A.

This southern group of features occurred approximately 40 cm lower than Features 1 and 26, to the north, again corresponding to the sediment slope that trended downward to the south. No evidence was noted of excavation related with the thermally altered stone clusters—no pits or basins were identified in association with the features—and the clusters exhibited relatively little relief, being virtually two-dimensional, with almost no depth or thickness. They were, therefore, assumed to have been surface manifestations, and their archaeological locations were assumed to have been approximately equivalent to their original or functional locations. While some of the fragments from the clusters had migrated upward into the A
horizon (and downward, as shown in distribution analyses in Appendix K), the rock clusters that were identified near the top of the E horizon appeared to represent the bases of the features. This implied that, given slight variations in ground surface, all of the features had been constructed and used on a single ground surface that sloped somewhat to the south and east, and that the surface did not change appreciably over the course of the activities that formed the rock clusters.

It should be noted at this point that there was no evidence of biomantling in the soil profile. Biomantling refers to the secondary deposition of artifacts in a relatively narrow band within the soil column as a result of natural perturbation of the sediments. Originally referring to materials sorted and brought to the surface by burrowing animals (Soil Survey Staff 1975:21), the concept of biomantling has more recently been broadened to include the sorting of buried materials in a variety of ways. The process is characterized by “one or more differentiated layers of soil produced largely by bioturbation—soil mixing by animals and plants” (Johnson 1990:84). In simplest terms, artifacts may tend to settle at the base of biological disturbance in a stable soil column, resulting in the formation of a depositional layer that mimics a buried surface deposit, creating a false occupation level. As early as the late-nineteenth century, Charles Darwin (1881) recognized the effect that biological agents have on soil strata. He observed that earthworms can create a stone-free layer in the form of an organic surface horizon, which he termed a “vegetable mould.” In addition, he noted gravelly layers may form below the surface either within or below topsoils as a result of burrowing. Further studies have indicated that, depending on a variety of factors, including soil type, moisture content, and the mixing vector, or type of perturbation, biomantling can be one-, two- or multi-layered. In soils of uniform texture, biomantles tend to be one-layered (Johnson 1989).

Analysis of the data from the Block A excavation suggested that bioturbation was an unlikely source for the deposition of the thermally altered stone clusters. General artifact distributions were consistent above and below the level of the features—the burned rock concentrations were not contained in a narrow stratum of high artifact density, but rather were part of a wider, relatively uniform vertical distribution. In addition, there was no actual correlation between the vertical limit of biological activity in the profile and the feature bearing stratum. Instead, the features occurred high in the sediment column, within the active biological zone, not near its base. To argue that this level was the base of a much earlier biological zone would require the ground surface to have been considerably higher than its modern grade, and there is no recorded mechanism regionally or locally for the deflation of such a ground surface to its current elevation.

Further analysis of temporal component separation involved examining the basin features in the block, and assessing their relationships to the thermally altered stone features. The overall duration of the occupations represented in the block excavation may be indicated by the relative depths of the basin features, especially in the southern half of the block. In several cases, there was evidence that the basins were not directly associated with the thermally altered stone clusters. For example, Feature 22 was a heated rock cluster located on top of Feature 7, which was a large, elongated basin in the south-central part of the block. Analysis of the vertical distribution of thermally altered stone fragments in Feature 7, along
with detailed analyses of attributes of similar artifacts in both features (Appendix K), suggested that they were distinct and separate entities. In another instance, a cluster of burned rocks occurred at the top of Feature 43. They were originally included as part of that pit feature, but analyses similar to those conducted for Features 22 and 7 suggested that the heated stone fragments from Feature 43 were not part of the pit fill, but rather represented a small, separate artifact cluster. In a third instance, two small pit features in the southeast corner of the excavation, Features 38 and 39, were recorded at elevations lower than those of Feature 45 and of the thermally altered stone cluster atop Feature 43. The sole pit feature that may have been directly related a cluster of thermally altered stone was Feature 9, an elliptical pit in the northeast part of the block that appeared contemporary with the adjacent Feature 1.

Most of the pit features in the excavation block, then, appeared to be unrelated, either functionally or chronologically, to the series of thermally altered stone clusters documented at the top of the E horizon. With the exception of Feature 9, all of the basin features were located below the level at which the thermally altered stone features were recorded, and thus they were by implication earlier in date than those features. Specific temporal data from the basins, reviewed above, were ambiguous, leaving only relative chronology. Taking inferences from the contexts of the pit features a step further; three main depositional units could be drawn schematically. The first major occupation represented in the block corresponded with the lower part of the E horizon (Figure 6-30a). The exact vertical locations in which the artifacts were deposited are unclear, and in fact the individual depositional episodes had probably been mixed. Nevertheless, the early occupation debris would have comprised a large proportion of the artifacts in the lower part of the current profile (Figure 6-30d). A series of basin features—including all of the basins in the southern part of the block—were cut into what is now the E horizon (Figure 6-30b). The basins comprised a second major deposit that post-dated the artifact deposits in the E horizon. Depending on how and when the features were infilled, the artifacts in the feature fills could have been derived from the surrounding deposits in the E horizon: more likely, they were related to later occupations. The third and latest major depositional unit was represented by the thermally altered stone features located above the level of the basins (Figure 6-30c). The rock concentrations necessarily post-dated the pit features since they overlay and were distinct from them.

All three of the main cultural units occurred within the same 20-30 cm layer, as depicted in the schematic drawing of the current profile, in Figure 6-30d. These cultural units were distinguishable as separate deposits only by the boundaries of the pit features that carried with them implications for the sequence of deposition. It was not possible to distinguish non-diagnostic artifacts from specific components. Chronological data were not plentiful or fine-grained enough to bring out patterning, nor was there evidence of polymodality in vertical artifact distribution analyses that might suggest the remnants of individual depositional layers.
Figure 6-30. Development of the Archaeological Stratigraphy in Block A Current Profile.
(modern soil horizons indicated on d.)

Since separating non-diagnostic artifacts analytically was impractical, the debris assemblages representing the extreme ends of the occupational sequence were examined to determine whether or not there were observable differences in the distributions that might signal activity variation. The depositional extremes consisted of: the A horizon, which contained portions of the thermally altered stone features and artifacts associated with them (as demonstrated by the correlation between the artifact concentrations mapped in cluster analyses and the feature locations seen in Figure 6-25); and the lower levels of the E horizon, which contained material contemporary with the period before the pit features were excavated. Note that included in the lower analytical unit, referred to collectively as the E2 horizon, was all of the material occurring below the first level of the E horizon, including artifacts in the B horizon. It was recognized that neither deposit could be assumed to be a pure, single-episode component—the A horizon may have contained material deposited later
than the thermally altered stone features, and the lower or E2 horizon may have contained material earlier than the first major occupation. But there was no evidence of substantial late (i.e., Late Woodland) or early (early Late Archaic or prior) occupation in this part of the site, and thus it was supposed that any such material would be negligible in terms of its effect on the analyses. It was also acknowledged that artifacts from both the A and E2 horizons represented incomplete samples of the original cultural deposits, especially in the case of the E2 horizon. Nonetheless, each was presumed to be unmixed chronologically and to constitute a representative sample of the material from a distinct period of occupation. The key concept facilitating the analysis was that the deposits were unmixed, reasoning that a smaller amount of data, but data with good context, would be more useful than a large amount data of questionable or uncertain context.

The results of spatial analyses of artifact distributions in the A horizon and the E2 horizon and below were plotted for comparison (Figure 6-31). Obvious differences in the distributions were noted, implying that the depositions were in fact discrete and not substantially intermixed. Artifact concentrations in the E2 horizon in the northeast, central, and southern parts of the block, for example, did not have counterparts in the A horizon. Detailed examination of the artifact groups indicated that they consisted of either discrete clusters of thermally altered stone fragments, flaking debris, or combinations of both artifact types. The clusters in the lower, E2 horizon in the north and central parts of the block were particularly distinct in relation to the overlying A horizon deposits. The material to the south was less clearly differentiated, due to generally higher artifact frequencies in that part of the site and the greater amount of prehistoric activity thus implied.

![Figure 6-31. Artifact Concentrations in A and E2 Horizons, Block A.](image)

**Activity Area Analysis**

Broad patterns of archaeological site structure—how the site was laid out as an archaeological deposit—were expected to have remained at 7NC-J-228. The major challenge at this site (and most sites) was delineating the original occupational contexts from the
archaeological record. The latter results from a combination of cultural actions conducted on surfaces which sometimes had traces of earlier human activities, and also were subject to a number of natural and cultural postdepositional processes, such as recycling, trampling or animal burrowing.

In an effort to simplify the detailed spatial distribution data, the artifacts and features from the two main depositional units in Block A were grouped by presumed function. Combining the spatial data in this manner provided generalized information on the range of activities that might be represented by the artifacts or artifact clusters. The activity groups included 1a) bipolar pebble reduction; 1b) tool maintenance; 1c) general lithic reduction; 2a) processing / cutting; 2b) processing / scraping; 2c) processing / heating; 2d) processing / grinding, crushing; 3a) procurement / hunting; 3b) procurement / quarrying; 4) storage; 5) ceremony. Discussion of the groups and the archaeological evidence associated with them is included in Section 5.3.3, Analytical Methods.

The artifacts and features identified in this manner were plotted on maps of the excavation block. Figure 6-32 shows the functional assignments given to materials in the A horizon, which represented the later occupations at the site. The resulting data were then further grouped on the basis of relative proximity in order to form bounded areas within which certain sets of activity could be inferred. These areas were displayed as ellipses, drawn on an impressionistic basis using a combination of artifact and feature locations, along with the results of spatial analyses of non-tool artifacts (flaking debris and thermally altered stone fragments, shown earlier in Figures 6-27 and 6-28), the latter used to determine specific boundaries between groups. Note that the distributions depicted in the spatial analyses were mathematically derived, while the activity groupings were not, and so there are no rigorous confidence limits associated with the polygons as they are depicted in the resulting maps (Figures 6-33, 6-34).

Activity Groups in the A Horizon

In the data from the A horizon, a broad pattern was noted in which the thermally altered stone fragments occurred in two main areas forming diagonal swaths across the excavation block (Figure 6-32). Much of the other activity occurred away from these areas. Evidence of those other activities included: debris left from stone tool production—mostly debris from the bipolar reduction of pebble material available in the nearby stream valley; hunting preparation activity, evidenced by symmetrical points; resource processing tasks that involved cutting, evidenced by bifacially edged tools with asymmetrical points; resource processing tasks that involved scraping, evidenced by tools with unifacial wear and rounded edges. Overall, there was more activity in the southern part of the excavation block, particularly in the southwest corner. The specific activity areas appeared to be extensively overlain in this part of the site, creating a more uniform artifact distribution within which distinct patterns could not be recognized. There were more hunting-related artifacts in the northern part of the block, while more tools with evidence of cutting and scraping-related activity occurred in the southern part of the block. There was evidence of lithic reduction in all areas, but reduction debris were most extensive in the south, where there was also more debris specifically identifiable as resulting from bipolar reduction.
Figure 6-32. Plot of Activity Groups in the A Horizon, Block A.

Figure 6-33. General Activity Areas in Late Occupation Based on the Distribution of Tools and Artifact Concentrations in the A Horizon, Block A.
Tool maintenance debris occurred in the northern heated stone area, but there was little evidence of associated primary lithic reduction. Features 1 and 9, in the northeast part of the block, may have represented a specialized processing locale, with the heavily fractured stone for Feature 1 being the remnants of rocks used to heat the contents of a lined pit, Feature 9. Yet, because this part of the site had less indication of intensive utilitarian activity than the area in the southern part of the block, it is possible that the features were less economic in nature, but related to non-material or ceremonial activities such as purification or sweatlodge rituals. The presence of hunting-related artifacts in this part of the site could also be related, were the rituals specifically aimed at purification associated with a hunt. In the southern part of the block, cutting and scraping tools and tool maintenance debris were intermixed with the heated stone features—not directly in the features, but between them. This finding suggested that in this part of the site there was: 1) more extensively overlain deposition, implying more repeated use of the same surface; 2) more varied, economically-based activity and different forms of resource processing; or, 3) less site maintenance during one or more of the occupations. In the end, a combination of these three interpretations was likely the case.

Activity Groups in the E2 Horizon

Analysis of the lower depositional layer, comprising the E2 horizon and below, showed evidence of different horizontal structure from the A horizon (Figure 6-34). While no extensive zones of heated rock features were present, there were concentrations of thermally altered stone fragments in two areas unaligned with the stone features in the overlying strata. In the northeast corner of the excavation block, a thermally altered stone concentration occurred north of Feature 1 and east of Feature 26, and appeared to have been unconnected with them. The raw material distribution in the cluster was different from that of either feature (less quartzite, more cryptocrystalline material), and mean fragment size was lower (see Appendix K for details of the artifact analyses). The fragments may thus have been the dispersed remains of a small feature unrelated to the overlying clusters. Immediately to the south, and partially overlapping the thermally altered stone distribution, was a concentration of flaking debris that exhibited cortex-bearing fragments in frequencies lower than average for the site, suggesting the remnants of late stage reduction or tool maintenance. A utilized flake in the area provided evidence of scraping activities.

Additional concentrations of thermally altered stone fragments occurred in the central part of the block, along the N230 grid line, north of the locations of Features 7 and 21. The group to the east was comprised of small fragments of quartzite and quartz, with no other material types present. The group to the west comprised a typical mix of materials, but also included smaller fragments than those in the features in the A and E1 horizons (Appendix K). Flaking debris overlay the western thermally altered stone group, and included a typical mix of lithic material types and cortex-bearing pieces. There was also evidence in the group of expedient tools in the form of utilized flakes. South and east of the two thermally altered stone groups was a cluster of bipolar flaking debris, consisting mostly of quartz and including two cores, an early stage biface, and an anvil, the latter of quartzite. In the southern-most part of the block was an area with evidence of mixed activity, including non-specific reduction debris, a relatively high proportion of which (almost 50 percent) was quartz. Also present were small-sized flakes, suggesting tool maintenance as opposed to primary reduction, and utilized flakes with wear patterns indicating cutting tasks.
3.9.2 Block B

**Stratigraphy**

This block consisted of 23 one-meter-square units arranged in a cruciform pattern directly south of Block A (Figure 6-5). The cross-trench was widened by a meter in three places to investigate features or anomalies. Stratigraphy revealed during excavation can be summarized as follows: an organic-enriched surface or A horizon, overlying developing soil layers including a leached or eluviated E horizon and a mineralized B horizon, with a basal deposit consisting of medium coarse sandy C horizon (Figure 6-35). Due to the undulating upper surface of the C horizon, the B horizon did not consistently underlie the E horizon throughout the block. The B/C designation is used in the following descriptions to designate sub-E horizon soils and the artifacts therein. The E horizon was thicker (20 to 50 cm) in Block B than in other portions of the site (~20 cm). A thicker E horizon likely resulted from the block’s location in a low swale on the landform combined with coarser subsoils closer to the surface allowing for increased drainage through the profile.
Artifacts
Approximately 97 percent of the artifacts recovered from Block B were prehistoric. The remaining artifacts were historical artifacts contained within the A horizon (Table 6-15). A discussion of the historical component of 7NC-J-228 is provided in Appendix C.

Table 6-15. Total Artifact Distribution By Soil Horizon in Block B.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Historical</th>
<th>Prehistoric</th>
<th>Total by Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>21</td>
<td>389</td>
<td>410</td>
</tr>
<tr>
<td>E</td>
<td>--</td>
<td>268</td>
<td>268</td>
</tr>
<tr>
<td>B/C</td>
<td>--</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>features</td>
<td>--</td>
<td>106</td>
<td>106</td>
</tr>
<tr>
<td>Total by Group</td>
<td>21</td>
<td>794</td>
<td>815</td>
</tr>
</tbody>
</table>

The prehistoric artifacts were concentrated in the upper two horizons with a slight majority (57 percent) contained in the A horizon. Seventy-nine percent of artifacts recovered from the E horizon were contained within the first 20 cm below the A horizon. The remainder of the material was recovered from feature proveniences, with a small amount recovered from the B/C horizon. The artifacts consisted mainly of flakes and thermally altered stone fragments (Table 6-16). The chipped stone to thermally altered stone artifact ratio was 0.6:1. The proportion of chipped stone to thermally altered stone was similar within each of the major soil horizon proveniences. As observed in Block A, the lack of variation in overall artifact frequencies between the A and E horizons suggested little cultural differentiation represented within the sediment stratigraphy.

Table 6-16. Prehistoric Artifact Distribution by Type and Soil Horizon in Block B.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>A</th>
<th>E</th>
<th>B/C</th>
<th>Feature</th>
<th>Total by Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>biface</td>
<td>2</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>3</td>
</tr>
<tr>
<td>chip</td>
<td>20</td>
<td>8</td>
<td>1</td>
<td>--</td>
<td>29</td>
</tr>
<tr>
<td>core</td>
<td>1</td>
<td>3</td>
<td>--</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>flake</td>
<td>111</td>
<td>125</td>
<td>18</td>
<td>5</td>
<td>259</td>
</tr>
<tr>
<td>point</td>
<td>--</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>potlid</td>
<td>6</td>
<td>5</td>
<td>--</td>
<td>--</td>
<td>11</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>248</td>
<td>124</td>
<td>12</td>
<td>101</td>
<td>485</td>
</tr>
<tr>
<td>ceramic</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>Total by Soil Horizon</td>
<td>389</td>
<td>268</td>
<td>31</td>
<td>106</td>
<td>794</td>
</tr>
</tbody>
</table>
Projectile Points

- Woodland I straight-stemmed

![Projectile Point](image)

Raw material: cryptocrystalline
Dimensions: length 39 mm; width 18 mm; thickness 6.6 mm
Comments: A short-stemmed, narrow-bladed example of the type. The blade was slightly asymmetrical, with one blade edge convex, the other showing irregular flaking from that appears to be from resharpeming. The shoulders were prominent, and the base convex, with no remnant cortex. Flaking consisted of well-patterned pressure flaking. An oblique snap break had removed part of the stem and base.

Comparative data: see Woodland I straight-stemmed variety in Block A. The current specimen was within the dimensional ranges of the compared samples.

Chronology: see Woodland I straight-stemmed variety in Block A.

- Distal Fragment (n=1)
  
  Raw material: cryptocrystalline
  
  Description: Consisted of a large portion of a thin and very well-flaked blade, with convex blade edges and fine, patterned pressure flaking; the existing fragment is 32 mm in length and was separated from the rest of the blade at an oblique snap break.

Bifaces

- Early Stage Biface (n = 1)
  
  Raw material: cryptocrystalline
  
  Dimensions: length 60 mm; width 43 mm; thickness 43 mm
Description: The biface was made on a large flake, possibly a bipolar flake. It exhibited minimal flaking designed to initiate a bifacial edge, and retained cortex over more than 50 percent of one face, the dorsal surface of the original flake. There were many inconsistencies visible in the raw material, and these probably led to its rejection and discard.

- Late Stage Bifaces (n = 2)
  
  Raw material: 1 quartz, 1 quartzite
  
  Dimensions:

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>quartz</td>
<td>47 mm</td>
<td>20 mm</td>
</tr>
<tr>
<td>quartzite</td>
<td>54 mm</td>
<td>24 mm</td>
</tr>
</tbody>
</table>

  Description: The quartz specimen was a finely made, lozenge-shaped biface with an oblique snap break that had removed part of the proximal end of the artifact. The quartzite specimen was long and narrow. The proximal end was unthinned, and the distal end was missing at a transverse snap break. Neither artifact retained remnant cortex.

Cores

There were four cores recovered from Block B: 2 bipolar, and 2 multi-directional freehand.

- Bipolar (n=2)
  
  Raw material: 2 cryptocrystalline
  
  Dimensions:

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>cryptocrystalline</td>
<td>32 mm</td>
<td>31 mm</td>
</tr>
<tr>
<td>cryptocrystalline</td>
<td>58 mm</td>
<td>37 mm</td>
</tr>
</tbody>
</table>

  Description: Both were pebble cores that showed little flaking beyond the initial bipolar blow that split the pebble. Material flaws and artifact size appeared to have led to rejection from further reduction attempts.

- Multi-directional freehand (n=2)
  
  Raw material: 1 quartz, 1 quartzite
  
  Dimensions:

<table>
<thead>
<tr>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>quartz</td>
<td>73 mm</td>
<td>56 mm</td>
</tr>
<tr>
<td>quartzite</td>
<td>67 mm</td>
<td>59 mm</td>
</tr>
</tbody>
</table>

  Description: Both artifacts were cobble cores with extensive, though unpatterened flaking. Small patches of cortex remained on each artifact.
Flaking Debris
There were 288 fragments of flaking debris (flakes and chips) recovered from the excavations in Block B, with slightly more than three-quarters of the debris consisting of cryptocrystalline material:

<table>
<thead>
<tr>
<th>Material</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>cryptocrystalline</td>
<td>220</td>
<td>76%</td>
</tr>
<tr>
<td>quartz</td>
<td>45</td>
<td>15%</td>
</tr>
<tr>
<td>quartzite</td>
<td>22</td>
<td>8%</td>
</tr>
<tr>
<td>siltstone</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>288</strong></td>
<td></td>
</tr>
</tbody>
</table>

The majority of the flaking debris (91 percent) was recovered from the A and E horizons, with only five fragments recovered from feature proveniences. As with the overall site frequencies, the relative proportions of the raw materials types among the flaking debris were similar within the A and E horizon, with cryptocrystalline material accounting for 71 percent and 79 percent of the debris from each sediment respectively. With respect to fragment size, 80 percent of the flaking debris was less than 2 cm in maximum dimension. Remnant cortex was present on 45 percent of the cryptocrystalline debris and 27 percent of the non-cryptocrystalline debris. Three of the larger cortical cryptocrystalline flakes exhibited microflaking suggesting use or intended use as a tool.

Thermally Altered Stone
A total of 485 thermally altered fragmented and whole stones, with a combined weight of 33.7 kg, was recovered from Block B. The majority of this material (74 percent) consisted of quartzite (Table 6-16). Vertically, 51 percent of the thermally altered stones were contained in the A horizon, with 25 percent recovered from the E horizon and 21 percent from feature proveniences. Most of the stones within feature proveniences (with the exception of Feature 29) originated at the top of the E horizon, reflecting the nearly even distribution of artifacts between the two sediment layers. Less than 4 percent of the thermally altered stone occurred as whole clasts.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Chert</th>
<th>Jasper</th>
<th>Quartz</th>
<th>Quartzite</th>
<th>Other</th>
<th>Total by Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>3</td>
<td>10</td>
<td>49</td>
<td>176</td>
<td>10</td>
<td>248</td>
</tr>
<tr>
<td>E</td>
<td>--</td>
<td>4</td>
<td>11</td>
<td>101</td>
<td>8</td>
<td>124</td>
</tr>
<tr>
<td>B/C features</td>
<td>--</td>
<td>--</td>
<td>6</td>
<td>6</td>
<td>--</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total by Material</strong></td>
<td>3</td>
<td>16</td>
<td>81</td>
<td>361</td>
<td>24</td>
<td>485</td>
</tr>
</tbody>
</table>
Ceramics

- Coulbourn (n = 1)

The single Coulbourn sherd was assigned to an assemblage of similar ceramics: Lot CC1 (see be;pw).

Segment: body
Dimensions: thickness: 8.0-9.0 mm; weight: 15.3 gm
Temper: clay
Surface/treatment: exterior, cord-marked; interior, cord-marked
Description: The single ceramic sherd from Block B was tempered with crushed pieces of reddish-orange clay that ranged up to 4.0 mm in size. Natural inclusions comprised 10 percent of the paste and included poorly sorted feldspar, olivine, and iron oxide. The paste was only lightly mixed, leaving the paste mottled with color lines from the various components. It was slightly gritty in texture, but the predominant effect was of a very “pasty” vessel. The exterior surface was deeply impressed with cord marks oriented parallel to the coils, ranging in size and formed with a final S-twist. The interior surface also was impressed with cords, but the impressions were not as deep and were oriented perpendicular to the coils. The sherd had broken along a coil line. See Appendix G, Lot CC1 for complete description.

The sherd from Block B was consistent with descriptions of Coulbourn ware, first defined by Artusy (1976). The temporal span for the manufacture and use of Coulbourn ware (and its cognates, Nassawango ware and Wilgus ware) was 400 BC to AD 1 (Custer 1994). The Coulbourn ware vessels were conoidal in shape, coil-constructed, and exhibited either cord or net impressed exterior surfaces.
Features

Four cultural features, two thermally altered stone clusters and two basins, were identified in Block B (Figure 6-36). Complete descriptions, measurements, drawings of the features are presented below. The results of analyses of the features follow the descriptive summaries.
Feature 12

Centerpoint
N217.96/E450.94

Type
A-1b/B-2: Thermally Altered Stone/Basin

Morphology
Plan: Oval
Profile: Shallow, Gradually Sloped

Elevation
10.05 m AMSL
(E horizon)

Dimensions
Length: 120 cm
Width: 55 cm
Depth: 12 cm

Volume: 30.02 liters

Soil Classification
Dark Yellowish Brown
10YR4/4
Sandy Loam

Artifacts
75 (9.446 kg) Thermally Altered Stones
2 Flakes

Ecofacts
Not Collected

Radiocarbon Assay
Not Dated

Description
Feature 12 consisted of a cluster of thermally altered stones in a shallow basin. This feature originated at the top of the E-horizon. A large root from an adjacent hardwood tree grew through the feature and appeared to have altered the positions of some of the stones in the western half of the distribution. The fill within the basin was slightly darker than the soil in the surrounding E-horizon. Seventy percent of the stones were quartzite. Quartz was also present (20 percent of the total), along with small amounts of jasper, sandstone, and gneiss.
Plan:

Profile:

Key

thermally altered stone

basin

Feature 12
Feature 13
Centerpoint
N220.00/E453.00

Type
B-2: Basin

Morphology
Plan: Ovoid
Profile: Steep Sided, Rounded Base

Elevation
9.81 m AMSL
(A/E transition)

Dimensions (as excavated)
Length: 156 cm
Width: 80 cm

Depth: 68 cm
Volume: 238.01 liters

Soil Classification
Dark Yellowish Brown
10YR4/6
Sandy Loam

Artifacts
13 (0.345 kg) Thermally Altered Stones

Ecofacts
Not Collected

Radiocarbon Assay
Not Dated

Description
Feature 13 was a basin identified at the interface of the A-horizon and E-horizon. The feature was ovoid in opening plan. As excavated, the feature showed steep sides and a rounded bottom. Feature fill was darker and contained less gravel than the surrounding subsoil. Minor root disturbance was also noted. All of the artifacts were recovered from the first arbitrary 10 cm level. The feature was bisected by the placement of the block excavation along the N220 gridline: it is estimated that the excavated sample comprised approximately one-half of the feature.
Feature 14

Centerpoint
N215.24/E452.31

Type
A-1b/B-2: Thermally Altered Stone/Basin

Morphology
Plan: Amorphous
Profile: Bowl Shape

Elevation
10.11 m AMSL
(E horizon)

Dimensions (as excavated)
Length: 100 cm
Width: 54 cm
Depth: 9 cm
Volume: 18.41 liters

Soil Classification
Dark Yellowish Brown
10YR4/6
Loamy Sand

Artifacts
12 Thermally Altered Stones
(not weighed)

Ecofacts
Not Collected

Radiocarbon Assay
Not Dated

Description
Feature 14 consisted of a cluster of thermally altered stones located within a shallow basin. A cluster of stones was first noted within the E horizon of Test Unit N215/E452 during site evaluation (Phase II) investigations. During data recovery (Phase III) investigations, excavation of Test Unit N214/E452 revealed two thermally altered stones located in a shallow basin truncated to the north by the site evaluation (Phase II) unit. The basin fill was darker than the surrounding E-horizon. The feature, as documented, was contained within the first 10 cm of the E-horizon. Sixty thermally altered stones were recovered from the A horizon above and to the southwest of Feature 14 in units N214/E451, N215/E452. An additional 27 thermally altered stones were recovered from the E horizon in units N214/E452 and N215/E452.

There is no photograph available for this feature.
Plan:

Profile:

Key

thermally altered stone

basin

Feature 14

0  20  40cm
Feature 29

Center point
N216.58/E451.34

Type
B-3a/A-1a: Basin/Thermally Altered Stone

Morphology
Plan: Circular
Profile: Steep-Sided, Flat-Bottomed

Elevation
9.83 m AMSL
(base of E horizon)

Dimensions (as excavated)
Length: 78 cm
Width: 70 cm

Depth: 57 cm
Volume: 120.63 liters

Soil Classification
Dark Yellowish Brown 10YR4/6
Sandy Loam

Artifacts
10 (1.861 kg) Thermally Altered Stones
3 Flakes

Ecofacts
Not Collected

Radiocarbon Assay
Not Dated

Description
Feature 29 was a basin feature with straight sides and a flat bottom. A cluster of thermally altered stones and unaltered cobbles occurred within the basin approximately 40 cm below the opening. The feature fill was darker than surrounding soil matrix. There was extensive disturbance to the upper portion of the feature from the roots of a nearby hardwood tree. The top of the feature was identified in profile only.

There is no photograph available for this feature.
Feature Analysis and Interpretation

Feature 12

Feature 12 was small in comparison with the Block A features, with an area calculated as 0.66 m². Artifact density (113.6 artifacts/m²) was low in comparison with similar features in Block A, while the mean weight of the fragments, 126 gm, was similar to the largest fragments in Block A. The rock cluster occurred in a basin suggesting that the context of Feature 12 may have been primary; the high fracture percentage implied intense or prolonged heat such as might be associated with a small roasting pit.

Feature 13

Feature 13 was bisected during excavation and the excavated sample represented only half of the feature. Because the pit was not fully excavated, its length:width ratio and ratio depth statistics were not calculated. Artifact density in the portion of the feature sampled was calculated as 0.05, very low in comparison with the basin features excavated in Block A. Considering their provenience in the uppermost level of the fill, the artifacts may thus have been incidental to the feature, not associated with its original function. Based solely on the shape of the pit, with deep, steeply sloped sidewalls, the original function may have been related to storage.

Feature 14

Feature 14 consisted of a cluster of thermally altered stones and associated basin. Twelve stones were positively identified as part of the feature. Sixty thermally altered stones were recovered from the A horizon above and to the southwest of Feature 14; an additional 27 thermally altered stones were recovered from the surrounding E horizon. These fragments and the partially defined basin were likely the remains of a larger cluster, most of which had been disturbed by plowing. Given the associated basin, the original context of the feature may have been primary, but the amount of plow disturbance made further analysis and interpretation unwarranted.

Feature 29

Feature 29 was a basin feature with straight sides and a flat bottom. A cluster of thermally altered stones and unaltered cobbles occurred within the basin approximately 40 cm below the opening. The circular shape of the pit opening was reflected in a length:width ratio of 1.1. A ratio depth figure of 1.3 suggested a shallow basin in relation to the opening, particularly in comparison with the pit features documented in Block A, to the north. Artifact density (0.11 artifacts/m²) was low, providing little information about primary function or infilling.

Spatial Distribution

Given the lack of horizontal exposure throughout most of this block excavation, interpretation of spatial patterning is limited. The horizontal distribution of the two major artifact types (flaking debris and thermally altered stone) was similar between the two main
sediment layers (A horizon and E horizon) (Figures 6-37, 6-38). The frequency of flaking debris was nearly even between the A horizon and E horizon, with a slightly wider horizontal distribution in the A horizon. Flaking debris in the E horizon were concentrated near the center of the block, in test units encompassing Feature 12 and Feature 29. The majority of the artifacts (93 percent) recovered from the B/C horizon were associated with Feature 29, in the excavation unit at N216/E451. The concentration of artifacts throughout the profile of this unit suggested that the feature’s contents had been dispersed through tree root growth, an ongoing process that was observed in the field and hindered full delineation boundaries of the feature. Throughout the block there was slightly more thermally altered stone in the A horizon (n=248) than in the E horizon and feature proveniences combined (n=225). Thermally altered stone within the A horizon was concentrated in the excavation units encompassing Feature 14 and in the east-west trench of Block B. Non-feature thermally altered stone in the E horizon was less widely distributed in comparison with the A horizon distribution, with concentrations situated above Feature 29 and in association with the incompletely defined Feature 14.

Two chronologically diagnostic artifacts were recovered from Block B, one Coulbourn ceramic sherd and one Woodland I stemmed projectile point. The locations of these artifacts are depicted in Figure 6-36. Both artifacts have an Early-to-Middle Woodland date range. The ceramic sherd was recovered from the A horizon approximately one meter north of Feature 12. The point was recovered from the second arbitrary level within the E horizon above Feature 29.

**Figure 6-37. Distribution of Chipped Stone Artifacts by Soil Horizon, Block B.**
3.9.3 Block C

Stratigraphy

Block C consisted of 14 one-meter-square units (including two site evaluation (Phase II) units) arranged in a non-contiguous cruciform pattern on the gradually sloping western edge of the landform (Figure 6-5). Generalized stratigraphy within Block C can be summarized as follows:

Stratigraphy consisted of an organic-enriched surface or A horizon, overlying a developing, leached or eluviated E horizon and a mineralized coarse textured BC horizon. There was approximately 0.75 m of relief from east to west across the block. Soil deflation on this slope had resulted in a varying depth of the BC horizon (20-50 cm below surface). This variation is typified by the section profile in Figure 6-39, in which the upper sediment layers decrease in thickness between the higher and lower elevations. Root disturbances were also observed throughout the profile. No cultural features were identified in Block C.

Figure 6-38. Distribution of Thermally Altered Stone Fragments by Soil Horizon, Block B.

Figure 6-39. East/West Profile Section at N202 Gridline, Block C.
Artifacts

A total of 180 prehistoric artifacts were recovered from the upper two sediment layers in Block C (Table 6-18). Ninety-three percent were recovered from the A horizon. The remaining artifacts (flaking debris and thermally altered stone) were contained in the first arbitrary 10 cm level of the E horizon. No historical artifacts were recovered from Block C.

Table 6-18. Total Artifact Distribution by Soil Horizon in Block C.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Historical</th>
<th>Prehistoric</th>
<th>Total by Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>--</td>
<td>167</td>
<td>167</td>
</tr>
<tr>
<td>E</td>
<td>--</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>BC</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total by Group</td>
<td>--</td>
<td>180</td>
<td>180</td>
</tr>
</tbody>
</table>

Approximately 67 percent of the artifacts consisted of thermally altered stone fragments, of which 82 percent were quartzite (Table 6-19). The remainder were chipped stone artifacts consisting of primarily flaking debris. Cryptocrystalline materials accounted for 61 percent of the flaking debris in this block. Fifty percent of the chipped stone artifacts exhibited cortex. Chipped stone tools recovered included a late stage biface distal fragment and one contracting-stemmed projectile point.

Table 6-19. Prehistoric Artifact Distribution by Type and Material in Block C.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Cryptocrystalline</th>
<th>Quartz</th>
<th>Quartzite</th>
<th>Other</th>
<th>Total by Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>biface</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>chip</td>
<td>7</td>
<td>4</td>
<td>4</td>
<td>--</td>
<td>15</td>
</tr>
<tr>
<td>core</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>flake</td>
<td>25</td>
<td>11</td>
<td>1</td>
<td>--</td>
<td>37</td>
</tr>
<tr>
<td>point</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>potlid</td>
<td>4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>2</td>
<td>7</td>
<td>100</td>
<td>12</td>
<td>121</td>
</tr>
<tr>
<td>Total By Material</td>
<td>38</td>
<td>24</td>
<td>105</td>
<td>13</td>
<td>180</td>
</tr>
</tbody>
</table>

1Includes sandstone, siltstone, rhyolite
Points

- **Lackawaxen Contracting-STEMMED (n=1)**
  
  **raw material:** quartz  
  **dimensions:** length 39 mm; width 24 mm; thickness 7.3 mm

  **comments:** This was a relatively short-bladed example of the Lackawaxen type. The blade edges were convex, and there was evidence of pressure flaking to produce a finely shaped edge. The shoulders were prominent, the stem sharply contracting, and the base, which exhibited an oblique distal snap break, appeared to have been convex. The distal end of the blade was also missing along an oblique, slightly bending snap break. The point was plano-convex in cross section, and may have been made on bipolar core fragment or large flake. It approached descriptions of the Rossville type in terms of size, the prominence of the shoulders, and the narrowness of the neck and stem (see above, Block A description for comparative and chronological data).

  **comparative data:** see Lackawaxen contracting-stemmed variety in Block A. The current specimen fell at the low end of the reported length ranges, but were near average in terms of width and thickness.

  **chronology:** see Lackawaxen contracting-stemmed variety in Block A.

Bifaces

- **Late Stage Biface (n = 1)**
  
  **raw material:** rhyolite  
  **dimensions:** length 12 mm; width 13 mm; thickness 4 mm

  **comments:** This was a small fragment that appeared to be the distal end of a finely flaked biface of porphyritic rhyolite. Judging from the angle formed by the junction of the blade edges, which approached 90
degrees, the fragment could alternatively have been from a basal or shoulder tang. It was separated from the rest of the blade at a bending snap break.

Core

- Bipolar (n=1)
  - raw material: quartz
  - dimensions: length 53 mm; width 46 mm; thickness 20 mm
  - comments: This was a pebble core with no evidence of flaking beyond the initial bipolar blow that split the pebble and drove a large flake half-way up the opposite face. The core appeared to have been rejected for further reduction due to material flaws and artifact size.

Features

No features were identified in Block C.

Spatial Distribution

The majority of the artifacts were contained within the top 20 cm of the profile (the A horizon), and it is likely that the few artifacts situated beneath the A horizon were translocated by floral or faunal disturbance. Given the lack of horizontal exposure, the interpretation of spatial patterning was somewhat limited. However, the distribution shown in Figure 6-40 reveals higher artifact frequencies away from the center of the cruciform, along the northern extent of the excavation. This concentration was bounded by high artifact counts in units N201/E451 and N207/E450. While the artifacts in N201/E451, at the center of the cross-trench, consisted mostly of thermally altered stone (n=29), the artifacts in the northern unit, N201/E450, were evenly divided between chipped stone and thermally altered stone fragments. The position of this concentration of artifacts within the sideslope topsoil may be the result of erosion of surface or near-surface deposits from the crest of the landform to the east.

![Figure 6-40. Distribution of Prehistoric Artifacts By Soil Horizon, Block C.](image)
3.9.4 Block D

Stratigraphy

Block D consisted of 9 one-meter-square units in a 3-x-3-m arrangement at the southern end of the site (Figure 6-5). The block was an expansion of site evaluation (Phase II) investigations that identified a concentration of thermally altered stones, designated Feature 6, in Test Unit N189/E465. Stratigraphy revealed during excavation can be summarized as follows: an organic-enriched surface or A horizon, overlying developing soil layers, including a leached or eluviated E horizon and a mineralized B horizon (Figure 6-41).

![Figure 6-41. East/West Profile Section at N190 Gridline, Block D.](image)

Artifacts

Approximately 64 percent of the artifacts recovered from Block D were prehistoric (Table 6-20). The remaining artifacts were historical artifacts consisting primarily of brick fragments. All of the sub-A horizon historical artifacts were small brick fragments. A discussion of the historical component of 7NC-J-228 is provided in Appendix C.

Ninety-one percent of prehistoric artifacts recovered from Block D were thermally altered stone fragments, of which slightly more than 50 percent were provenienced as Feature 6 (Table 6-21). The proportion of material types among the feature and non-feature artifacts was nearly even, with both consisting of approximately 60 percent quartzite and 40 percent quartz. The remaining artifacts consisted of a small sample of flaking debris and a single bipolar core. Lithic materials represented by the chipped stone artifacts included cryptocrystalline materials (57 percent), quartzite, quartz, and rhyolite. Ten of the fourteen chipped stone artifacts had remnant cortex present.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Historical</th>
<th>Prehistoric</th>
<th>Total by Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>77</td>
<td>69</td>
<td>146</td>
</tr>
<tr>
<td>E</td>
<td>7</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>B</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Feature 6</td>
<td>3</td>
<td>75</td>
<td>78</td>
</tr>
<tr>
<td>Total by Group</td>
<td>87</td>
<td>156</td>
<td>243</td>
</tr>
</tbody>
</table>
Table 6-21. Prehistoric Artifact Distribution by Type and Soil Horizon in Block D.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>A</th>
<th>E</th>
<th>Feature 6</th>
<th>Total by Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>chip</td>
<td>4</td>
<td>2</td>
<td>--</td>
<td>6</td>
</tr>
<tr>
<td>core</td>
<td>1</td>
<td>--</td>
<td>--</td>
<td>1</td>
</tr>
<tr>
<td>flake</td>
<td>3</td>
<td>4</td>
<td>--</td>
<td>7</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>61</td>
<td>6</td>
<td>75</td>
<td>142</td>
</tr>
<tr>
<td><strong>Total by Soil Horizon</strong></td>
<td>69</td>
<td>12</td>
<td>75</td>
<td>156</td>
</tr>
</tbody>
</table>

**Core**

- **Bipolar (n=1)**

  Raw material: cryptocrystalline  
  Dimensions: length 82 mm; width 48 mm; thickness 26 mm  
  Comments: The only chipped stone artifact from Block D that was not flaking debris was a bipolar core made on a large, cryptocrystalline pebble. A single bipolar blow had sheared away most of one side of the pebble and had driven a large flake part-way up the opposite face. There was considerable crushing at both ends. No additional flake removals could be seen. The lithic material was grainy, and the piece had split along irregular planes, suggesting that the poor quality of the material may have led to rejection of the core from further reduction.
Features

One prehistoric cultural feature was identified within Block D. The results of analysis of the feature follows the descriptive summary.

**Feature 6**

**Centerpoint**
N189.08/E465.98

**Type**
A-1a: Thermally Altered Stone

**Morphology**
Plan: Circular
Profile: N/A

**Origin**
E horizon

**Elevation**
9.46 m AMSL

**Dimensions**
Length: 84 cm
Width: 80 cm
Depth: N/A

**Soil Classification**
Light Yellowish Brown 10YR6/4
Sandy Loam

**Artifacts**
75 (8.518 kg) Thermally Altered Stones

**Ecofacts**
Not Collected

**Radiocarbon Assay**
Not Dated

**Description**

Feature 6 was an isolated concentration of whole and fragmented thermally altered stones. This feature was identified on a single horizontal plane at the interface of the A horizon and E horizon approximately 20 cm below ground surface. The stones comprising this feature were not tightly clustered. Lithic materials present included quartzite (60 percent), quartz (37 percent), jasper, and sandstone. The soil matrix within the feature was consistent, in color and texture, with the surrounding E-horizon. Three small brick fragments were recovered from the feature matrix.

There is no photograph available for this feature.
**Feature Analysis and Interpretation**

**Feature 6**

<table>
<thead>
<tr>
<th>attributes</th>
<th>implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>scatter on a single plane</td>
<td>secondary context, little disturbance</td>
</tr>
<tr>
<td>mean weight: 113.6 g, similar to Block A features</td>
<td>less intense or prolonged heat</td>
</tr>
<tr>
<td>fracture frequency: 65%</td>
<td></td>
</tr>
</tbody>
</table>

**Interpretation of function/formation:**

The feature was an isolated concentration of whole and fragmented thermally altered stones identified on a single horizontal plane. The feature was small in comparison with the Block A features, with an area calculated as 0.67 m². Both artifact density (111.9 artifacts/m²) and fracture percentage were low in comparison with similar features in Block A. The low fracture percentage implied less intense or prolonged heat, while the scattered nature of the distribution suggested a secondary context.

**Spatial Distribution**

A small sample of chipped stone artifacts and a small area of exposure limit the interpretation of spatial data. Figure 6-42 shows the distribution of all prehistoric artifacts by soil horizon.

![Figure 6-42. Prehistoric Artifact Distribution By Soil Horizon.](image)

No artifacts were recovered below the second arbitrary 10 cm level of the E horizon, which contained five artifacts. Only fourteen chipped stone artifacts were recovered from Block D; eight from the A horizon and six from the E horizon. Horizontally, the chipped stone artifacts were clustered in the southwestern four units of the A horizon and within the northern three units of the E horizon. Taken as a whole the chipped stone artifacts were outside (to the north and west) the main cluster of thermally altered stones within and above Feature 6. Most of the thermally altered stones outside the feature boundaries were
recovered from the A horizon, with a concentration to the west of Feature 6. The thermally altered stones from the A horizon shared similar proportions of lithic materials suggesting that all of the thermally altered stone in Block D may have originated from the same activity. The difference in distribution of artifacts between the two sediment layers and the introduction of historical artifacts below the A horizon was likely the result of historical modification of the landscape combined with biogenic processes.

3.9.5 Block L

Stratigraphy

Block L consisted of 10 one-meter-square units (including one site evaluation (Phase II) unit) arranged in a non-contiguous cruciform pattern (Figure 6-5). Block L was located south of Block C and west of Block D, near the terrace edge as it sloped downward to the southwest. Stratigraphy in Block L can be summarized as follows: an organic-enriched surface or A horizon, followed by an eluviated E horizon, and in turn a mineralized, coarse-textured BC horizon. As observed in Block C, soil deflation had resulted in an undulating soil profile in which the E horizon was very thin or in some areas not distinguishable from the topsoils. Root disturbances were observed throughout the profile. Due to the alternating pattern of unit excavation, a profile section has not been included in this presentation.

Artifacts

Approximately 82 percent of the artifacts recovered from Block L were prehistoric. The remaining artifacts were historical and were confined to the A horizon (Table 6-22). A discussion of the historical component of 7NC-J-228 is provided in Appendix C.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Historical</th>
<th>Prehistoric</th>
<th>Total by Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6</td>
<td>25</td>
<td>31</td>
</tr>
<tr>
<td>E</td>
<td>--</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>BC</td>
<td>--</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Total by Group</td>
<td>6</td>
<td>29</td>
<td>35</td>
</tr>
</tbody>
</table>

Approximately 79 percent of the prehistoric artifacts consisted of thermally altered stone fragments (Table 6-23), the majority of which were quartzite. The remainder of the artifacts consisted of a small amount of flaking debris.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Cryptocrystalline</th>
<th>Quartz</th>
<th>Quartzite</th>
<th>Other</th>
<th>Total by Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>chip</td>
<td>4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>flake</td>
<td>1</td>
<td>--</td>
<td>1</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>2</td>
<td>6</td>
<td>12</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Total By Material</td>
<td>7</td>
<td>6</td>
<td>13</td>
<td>3</td>
<td>29</td>
</tr>
</tbody>
</table>

1 includes sandstone and siltstone
Features

No features were identified in Block L.

Spatial Distribution

Block L was located on the western terrace slope. This block showed a similar vertical distribution of artifacts as was recorded in Block C, with a majority of the material contained in the A horizon. There were several artifacts recovered from the BC horizon, but artifact size and the lack of extensive deposition in that stratum in other parts of the site suggested that the artifacts had been translocated downward through the profile through natural processes. With respect to horizontal distribution, sample sizes were small, but a trend was noted toward slightly higher artifact densities in units downslope, suggesting the possibility of displacement from the upper terrace through colluvial action (Figure 6-43).

Figure 6-43. Distribution of Prehistoric Artifacts, Block L.

3.9.6 Block M

Stratigraphy

Block M consisted of 17 one-meter-square units (including one site evaluation (Phase II) unit) arranged in a non-contiguous cruciform pattern (Figure 6-5). Block M was located southeast of Block B on the crest of the terrace. Stratigraphy in Block M can be summarized as follows: an organic-enriched surface or A horizon, overlying a developing, leached or eluviated E horizon, and a mineralized, coarse-textured BC horizon. This sequence is typified in the section profile between N207 and N212 in Figure 6-44, which also shows extensive subsurface disturbance resulting from the uprooting of a tree. The lack of prominent organic matter lower in the profile coupled with a lack of surface indications and truncation of the disturbance at the base of the A horizon suggests that the event occurred prior to historical modification of the terrace.
Artifacts

In total, 469 prehistoric and five historical artifacts were recovered from Block M (Table 6-24). Historical artifacts were mostly contained in the surface layer. Approximately 87 percent of the prehistoric artifacts were recovered from the A and E horizons. A discussion of the historical component of 7NC-J-228 is provided in Appendix C.

<table>
<thead>
<tr>
<th>Soil Horizon</th>
<th>Historical</th>
<th>Prehistoric</th>
<th>Total by Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>202</td>
<td>206</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
<td>200</td>
<td>201</td>
</tr>
<tr>
<td>BC</td>
<td>--</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td><strong>Total by Group</strong></td>
<td><strong>5</strong></td>
<td><strong>469</strong></td>
<td><strong>474</strong></td>
</tr>
</tbody>
</table>

The majority of the artifacts consisted of flaking debris followed in frequency by thermally altered stone fragments (Table 6-25). The ratio of thermally altered stone to chipped stone artifacts was 1:2.7. In contrast, the ratio was 1:0.6 and 1:0.8 in Blocks A and B, respectively. Cryptocrystalline lithic materials accounted for approximately 76 percent of the flaking debris, and of those, 45 percent exhibited cobble or pebble cortex. Twenty-three percent of the non-cryptocrystalline flaking debris exhibited cortex in comparison. The majority of the flaking debris (85 percent) ranged in size from <1.0 to 2.0 cm. The thermally altered stone recovered from Block M was comprised primarily of quartzite, reflecting the overall site pattern. Three bifaces and two cores were recovered, but no chronologically diagnostic artifacts were present.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Cryptocrystalline</th>
<th>Quartz</th>
<th>Quartzite</th>
<th>Other*</th>
<th>Total by Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>biface</td>
<td>1</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>3</td>
</tr>
<tr>
<td>chip</td>
<td>9</td>
<td>13</td>
<td>--</td>
<td>--</td>
<td>22</td>
</tr>
<tr>
<td>core</td>
<td>2</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>flake</td>
<td>254</td>
<td>51</td>
<td>5</td>
<td>2</td>
<td>312</td>
</tr>
<tr>
<td>potlid</td>
<td>4</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>4</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>4</td>
<td>16</td>
<td>104</td>
<td>2</td>
<td>126</td>
</tr>
<tr>
<td><strong>Total By Material</strong></td>
<td><strong>274</strong></td>
<td><strong>82</strong></td>
<td><strong>109</strong></td>
<td><strong>4</strong></td>
<td><strong>469</strong></td>
</tr>
</tbody>
</table>

*Includes rhyolite and siltstone
Bifaces

- Late Stage Bifaces (n = 3)

  Raw material: 2 quartz, 1 cryptocrystalline
  Dimensions: only one of the quartz specimens was complete—length 58 mm; width 18 mm; thickness 10 mm
  Comments: The complete quartz specimen was a narrow, lozenge-shaped biface. While the blade was not symmetrical, which may indicate that the artifact was a finished tool that had been used and resharpened, there was no clear evidence of use on the blade edges. The contracting proximal end exhibited a small patch of cortex at the base. The proximal end of the second quartz specimen was also contracting and similarly contained a small patch of remnant cortex. The distal end of the artifact was broken along a perverse fracture that had removed most of the blade. There were several percussion flakes removed from both of the remaining blade edges that represented an unsuccessful recovery attempt. The cryptocrystalline specimen was a small distal fragment broken at a long bending snap break.

Cores

- Bipolar (n=2)

  Raw material: cryptocrystalline
  Dimensions:

<table>
<thead>
<tr>
<th></th>
<th>length</th>
<th>width</th>
<th>thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>cryptocrystalline</td>
<td>68 mm</td>
<td>42 mm</td>
<td>28 mm</td>
</tr>
<tr>
<td>cryptocrystalline</td>
<td>73 mm</td>
<td>47 mm</td>
<td>33 mm</td>
</tr>
</tbody>
</table>

  Comments: Both cores resulted from the bipolar reduction of large pebbles. Both had opposing flake scars and crushed platforms. Neither showed evidence of further flaking, indicating that they had been rejected after an initial blow to test the raw material quality.

Features

No cultural features were identified in Block M.

Spatial Distribution

As mentioned above, the majority of the artifacts were contained in the upper two sediment layers at similar frequencies. However, the distribution of artifact types between the A horizon and the lower sediment layers was somewhat different (Table 6-26). Seventy-two percent of the thermally altered stone fragments were recovered from the A horizon, whereas a similar proportion (83 percent) of the chipped stone artifacts were recovered from the E and BC horizons. Of the artifacts in the sub-A horizons, 70 percent were contained in the first 10 cm level of the E horizon, and occurred in decreasing frequency with depth.
Table 6-26. Distribution of Artifact Types by Soil Horizon in Block M.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>A</th>
<th>E</th>
<th>BC</th>
<th>Total by Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>biface</td>
<td>--</td>
<td>3</td>
<td>--</td>
<td>3</td>
</tr>
<tr>
<td>chip</td>
<td>11</td>
<td>6</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>core</td>
<td>--</td>
<td>2</td>
<td>--</td>
<td>2</td>
</tr>
<tr>
<td>flake</td>
<td>99</td>
<td>154</td>
<td>59</td>
<td>312</td>
</tr>
<tr>
<td>potlid</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>thermally altered stone</td>
<td>91</td>
<td>33</td>
<td>2</td>
<td>126</td>
</tr>
<tr>
<td><strong>Total by Soil Horizon</strong></td>
<td><strong>202</strong></td>
<td><strong>200</strong></td>
<td><strong>67</strong></td>
<td><strong>469</strong></td>
</tr>
</tbody>
</table>

Figures 6-45 and 6-46 show the horizontal distribution of flaking debris and thermally altered stone by soil horizon across Block M. Artifact frequency within the A horizon was higher in the southwestern portion of the cruciform block. This pattern was reflected in the E horizon, with a relatively high frequency of flaking debris (n=65) in unit N209/E456. Eighteen additional flake fragments were recovered from below the E horizon in unit N209/E456. Field notes indicate that the majority of the artifacts were recovered from the eastern half of the test unit. The vertical distribution of the flaking debris throughout the eastern portion of this unit corresponds to the tree disturbance shown in the section profile above (Figure 6-44). It is possible that the artifacts originated higher in the profile and with a slightly greater horizontal distribution, but were redeposited at higher concentrations lower in the profile as a result of the uprooting or decay of the tree. Another sub-E horizon concentration of flaking debris (n=17) was located in unit N211/E462. While no disturbances were observed within this portion of the block, the lack of clear cultural deposition at this stratigraphic level in other parts of the site, and the frequency of artifacts directly above in the overlying levels strongly suggested that the artifacts had migrated downward from those deposits, and that evidence of the disturbance mechanism had been removed by soil formation processes. No thermally altered stones were recovered below the E-horizon.

**Figure 6-45.** Horizontal Distribution of Thermally Altered Stone by Soil Horizon, Block M.
Summary

Site 7NC-J-228 was situated at the north end of a terrace above a low-order tributary of Sandom Branch, overlooking the confluence of the tributary and the main branch of the stream. The core of the occupation debris occurred on a knoll that was bounded to the north by a steep drop-off to wetlands along Sandom Branch and to the south by a wide swale extended down slope toward the tributary, across which Site 7NC-J-227 was located. Investigations revealed evidence of three general periods of site use. An early deposit was identified low in the soil profile by a scattered distribution of chipped stone and thermally altered stone artifacts. The age of the occupation represented by this material was not determined. Evidence of later occupation consisted of a number of pit features excavated into the early deposit. Lastly, the uppermost stratum, which was by implication the most recent in date, contained a series of large, thermally altered stone features. Only this latest of
the three occupation levels contained verifiable temporal data, suggesting that the features were the remnants of site use in the Early or Middle Woodland periods.

The surface sediments at the site (A horizon) appeared to have been plowed across much of the area. Surface-generated biological activity was evident in portions of the underlying E horizon and B horizons, yet overall these deposits appeared to have been undisturbed. The A and E horizons contained the majority of the artifact evidence, with partially intact thermally altered stone and pit features encountered at or just below the A/E transition. The artifact bearing deposits, including the disturbed A horizon and intact E horizon, were thin, both layers occurring within an average 35 cm of ground surface across most of the area. The temporal components contained within the deposits were not well-separated.

Artifacts consisted of flaked and thermally altered stone, and approximately one-third of the artifacts occurred in feature contexts. Features consisted of thermally altered stone clusters and basin or pit features. Evidence suggested people first occupied 7NC-J-228 near the end of the Late Archaic period. Several broad-bladed points typed as Lackawaxen were recovered from the deposits, and three AMS dates were returned on carbon samples from the site: 3190±60 BP (cal 2 σ BC 1615 to 1317; Beta-149040) from sediment; 3770±40 BP (cal 2 σ BC 2334 to 2037; Beta-149039) from Feature 7; and 3860±40 BP (cal 2 σ BC 2464 to 2206l Beta-149032) from Feature 34. The two feature dates are statistically identical and produced a pooled mean age of 3815+28 BP (cal 2 σ BC 2401 to 2143). Woodland I stemmed and Rossville/Piscataway points, along with sherds of Marcey Creek and Coulbourn ceramics, indicated site use in the Early-to-Middle Woodland. An additional AMS date from the site, 2270±40 BP (cal 2 σ BC 400 to 207; Beta-149042) was returned on a sediment sample and appeared to date near the end of the Early Woodland period.

Spatial analyses suggested that general activity areas could be recognized in the artifact debris at the site. Most of the activity appeared to have been associated with clusters of thermally altered stone, implying extensive use of fire. Evidence tentatively related to hunt preparation was noted in part of the site, while stone tool manufacture and tool maintenance debris was documented in other areas.