Three small Virgin Branch Ancestral Puebloan sites were partially excavated by Utah State University Archaeology Field Schools in May and June of 2001 and 2002 (S. Simms P.I.) as part of a cultural resources evaluation by the Utah School and Institutional Trust Lands Administration (SITLA). The East Kanab 40 property is on Shinarump Flats about 17 miles east of Kanab, Utah in pinyon-juniper woodland, at an elevation of 5,400 feet (Figure 1). The parcel was surveyed by Utah State University in August 1999 (Fawcett 2000). Three sites were evaluated as potentially significant, and excavations were proposed to develop the evaluations in the event of a land transfer, and to contribute to knowledge about the Virgin Branch Ancestral Puebloan. The association with a university Archaeology Field School is consistent with the mission of SITLA.

The three sites are within a hundred meters of each other, and rest on flattened ridges overlooking a shallow sandstone wash, not far from a spring. To the north is an arable alluvial flat that captures moisture above the underlying sandstone bedrock. To the south the terrain rises to a sandstone rim. The vegetation is largely Utah juniper with an understory of scattered sagebrush, snakeweed, prickly pear, and yucca. The surrounding area is an archaeological landscape at densities approaching 50 sites per square mile. Survey of Seaman Wash located immediately to the east of the East Kanab 40 property documented 67 Virgin Branch sites (McFadden 1989, 1997).

Each site investigated by Utah State University enabled the investigation of research questions shaped by the findings encountered during survey and excavation. The strategy of investment in
subsequent analysis, artifact tabulation, and reporting emphasis vary among the three sites in response to the research questions. Problems investigated and reported here include:

- Ancestral Puebloan sites in this region are often constructed sequentially, and frequently in a linear pattern. Our research explores the tempo of mobility; the duration of abandonments between occupations at sequentially constructed sites. Tempo evaluates the temporal dimension of mobility and brings a processual dynamic that can complement the question of where a group falls on a typological scale ranging from sedentary to nomadic.
- We recorded the orientation of architectural features such as structures and storage bins. We found some variability among sites, and at one site a contrast among different occupations of the same place. Recording of orientations at incrementally constructed sites typical of this region may reveal patterns for comparison to astronomical orientations in other parts of the Southwest. Were such an effort to become common, it may help to gain purchase on one aspect of cosmological beliefs in different times and places in the ancient Southwest. This concept is related to tempo of mobility in that the reuse of sites may be by the same people, or if a period of abandonment is longer, by descendants. Similarity of orientation may be a proxy measure of sense of place and the association of cosmology with constructions of landscape by ancient inhabitants. Contrasts in orientation may signal different traditions and conceptualizations of these matters.
- One site yielded a lightweight, wickiup structure with a Puebloan floorplan motif, and abutting midden. Another site featured an incrementally constructed ramada in association with a typical linear arrangement of slab-lined bins that served as a work/storage area that was possibly female specific.

Figure 1. Area map.
Attention to these kinds of features broadens our documentation of architectural variability.

- We applied the well-known middle range theory of site structure, in this case featuring size sorting of floor refuse, and informed by ethnoarchaeology and microrefuse analysis to aid interpretation of the light wickiup structure. Microrefuse analysis was also useful for documenting the activities that occurred on the working floor under the ramada structure.

Summaries of the sites and our findings are:

Two Bin (42KA4894) reflects a Pueblo II chronological sequence beginning with a rectangular subsurface storage bin, a hiatus, and then another rectangular subsurface storage bin aligned with the earlier bin. This was followed by the construction of a masonry structure and associated midden deposits. In addition to documenting the historical sequence, our research strategy aimed to estimate the temporal interval between reoccupations; a facet of mobility conceptualized as the tempo of occupation. Observations of weathering of subsurface storage features after site abandonment and prior to reoccupation were combined with the experimental construction of storage bins like those at the Two Bin site. Our findings suggest that in this case, the tempo of occupation was on a decadal scale. We also offer observations on the value of recording the orientations of architectural features and the implications of these.

Weeping Juniper (42KA4895) is a Pueblo II period site that features a light, wickiup-style circular residential structure constructed on a classic Southwest floor plan including a ramped, southeast-facing antechamber, and stone deflector. A radiocarbon date on charred twigs recovered from the fire hearth date the structure to A.D. 1000–1170. A midden is in association with the structure, and an earlier, subsurface pit indicates a sequence of occupation at this site, but our work focuses on the light structure. The excavation at Weeping Juniper included the analysis of site structure as developed in ethnoarchaeology, specifically artifact size-sorting to aid the identification of the subtle residential structure.

Vermilion Vista (42KA4896) is a work/storage area, possibly female-oriented, and featuring a ramada with what may have been a low stone and adobe wall along the front of the structure creating a covered patio with fire hearths, subsurface pits, and an associated midden. Six slab-lined bins define the north wall of the structure. A midden consisting of an upper and lower layer is separated by sterile sands, and along with superposition, reclamation, and roof collapse from the ramada show that the site was constructed in at least two occupations spanning Pueblo I – Early Pueblo II times. The ramada burned twice during periods of abandonment, perhaps from wildfire, and the collapsed roof fall sealed the relatively clean floor of the structure. Six radiocarbon dates constrain the age of the site to A.D. 600–965, with occupation more likely toward the latter portion of this range. This site complements knowledge from the Two Bin site regarding the tempo of occupation at small Ancestral Puebloan sites where the same individuals, or people with the same memory tradition returned to significant places.

The Two Bin Site (42KA4894)

42KA4894, dubbed the Two Bin site, featured a scatter of lithic and ceramic debris and a concentration of lightly dressed sandstone construction stones suggesting a collapsed masonry structure, possibly with two rooms. Faint ash stains suggest hearths or midden deposits at the site.

Excavations exposed two rectangular, slab-lined storage bins, an above ground masonry structure, and an associated midden deposit. No radiocarbon dates are available for the site, but the architecture, ceramics, projectile points, and several maize macrofossils all point to a Pueblo II occupation in the Virgin Branch tradition (Figures 2 and 3).
Excavation

Trench 1 guided by a series of auger holes proceeded west to east to establish the relationship between the cultural deposits and sterile subsoil (Figure 4). After encountering Bin 1 and Bin 2, and midden deposits above these features, excavation exposed a small portion of floor in the 3 x 9 m, two room masonry Structure 1. The two bins are stratigraphically contemporaneous, but the sequence of construction, use, decay, and deposition of refuse show construction began with Bin 2, followed by a hiatus, the construction of Bin 1, another hiatus, followed by the construction of Structure 1 and deposition of an associated midden.

Bin 1

Bin 1 is a slab-lined storage unit (2 x 1.3 m x .3 m deep. Capacity 22 bushels) originating at the contact of strata II and III. A floor of sandstone flagstones sealed with clay was in an excellent state of preservation. The vertical walls of Bin 1 consisted of sandstone slabs and thin, grayish-white plaster slabs. Erosion was evident around the upper rim of the bin, and the plaster wall slabs had slumped. Many seemed to be missing suggesting reclamation by later occupants. The slab floor was covered by a 2–5 cm thick layer of sterile aeolian sands, indicating the bin stood open for a time after the contents were retrieved. Over that was 20 cm of compacted fill dominated by the disarticulated rubble of the plaster slabs used to line the bin walls. In the upper layers of this rubble were ashy refuse deposits and abundant ceramics and faunal remains. This sequence suggests a formation process where the bin contents were retrieved, aeolian sands were quickly deposited, and then the bin stood open to the elements as the walls collapsed over a significant span of time - years. Later reoccupation of the site deposited refuse into the nearly filled bin – something that could have happened quickly. Some of the wall slabs may have been reclaimed for other uses.

Figure 2. Photo of 42KA4894 looking west. Bin 2 at lower center right, Bin 1 center/left center. Scattered rock is Structure 1 debris with north wall of structure fallen at lower right.
Figure 3. 42Ka4894 plan view.
Key questions are how long did Bin 1 stand open as the walls collapsed, and how much more time passed before Structure 1 was occupied and the refuse was deposited in the remnants of Bin 1? Answers to these questions would shed light on the duration between reoccupations of this site – the tempo of occupation.

Bin 2

Bin 2 is a slab-lined storage unit (1.9 x 1.3 m x .35 m deep. Capacity 25 bushels), only partially excavated hence the dimensions are estimated. It also originates at the contact of strata II and III. Bin 2 is partially superimposed by the southwest corner of Structure 1 and by midden. The floor of Bin 2 is identical to Bin 1, but unlike Bin 1, a large portion of the vertical walls of Bin 2 remain standing and all are of tabular sandstone in contrast to the use of sandstone and plaster slabs in Bin 1. Also unlike Bin 1, Bin 2 appears to have been enclosed by a masonry collar. The contrasting methods of construction and the fact they do not abut suggests they may not be contemporaneous.

A 1–2 cm thick layer of sterile aeolian sands covers the floor of Bin 2, indicating it stood open for a short interval after the contents were retrieved. This was overlain by a mixture of sands and sandstone cobbles deposited quickly enough that the slab walls of the bin did not have time to slump as was the case in Bin 1. Bin 2 was thus largely filled before the reoccupation of the site associated with Structure 1 and the midden. In contrast, Bin 1 had stood open long enough for the walls to have collapsed, filling it with rubble, yet it was still open for the deposition of midden deposits after Structure 1 was built. Yet by this time Bin 2 was completely buried, and midden was deposited over the filled bin. As with their different characteristics of construction, this formation sequence indicates Bin 2 was constructed prior to Bin 1. The question of how much time passed between construction episodes also speaks to the matter of the tempo of occupation. It may be significant that both

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Stratum III: Unconsolidated aeolian sands. Lower boundary marked by a patchy carbonate concretion and the appearance of charcoal.

Stratum II: Midden deposits. Sediments transition from mottled gray to red sands. Charcoal present, decreasing in frequency with depth.

Stratum I: Undifferentiated light-tan sand. Upper eastern surface compacted and includes charcoal. Compaction and charcoal decreased moving west.
bins are constructed on an orientation of 68–70 degrees as is common at Virgin Branch sites.

Structure 1

Structure 1 measures 3 x 9 m with an interior dividing wall oriented west – east (Figures 2 and 3). Parallel scatters of rock associated with fallen walls were evident along the northern edge of the structure and less so along the southern wall. Vertical slabs line the interior in two places. The presence of an interior dividing wall is inferred from an alignment of dressed sandstone blocks, and a vertical slab along this axis. Both the north and south walls collapsed downslope and to the north. No interior features were found, but only a small portion of unpaved floor was exposed amid the abundant rubble and mortar, leaving open the possibility there is an interior hearth(s). The orientation of the north and south walls of structure 1 is about 85 degrees, contrasting with the orientation of the bins.

Midden

Trench 1 exposed a layer of ashy sands with significant amounts of decomposed charcoal, along with lithics, ceramics, faunal, and botanical materials. The midden was only excavated within Trench 1, hence its extent is unknown. It is identified as Stratum II in profile (Figure 4). It overlies Bins 1 and 2, and abuts Structure 1, indicating contemporaneity. The profile shown in Figure 4 shows Structure 1 overlying a portion of Stratum II midden, but this is just wall fall collapsing onto the midden.

Artifacts, Faunal, and Botanical Remains

Artifacts

The artifacts recovered from 42KA4894 are summarized in Tables 1 and 2. Flakes and tools represent all materials recovered. The ceramics include all of the material recovered from Bins 1 and 2 and the Stratum II midden. Surface ceramics and those from the surface blow sand are not included. Ceramics from Structure 1 are limited to an area immediately north and south of where Trench 1 passed through the structure where the association with floor contact was clear.

A cursory examination of these tables finds striking contrasts in artifact distributions. Most obviously, the vast majority of the 2,799 flakes and tools recovered were found on the surface, or in the midden and Structure 1. Only 47 pieces of debitage (1.7% of all debitage) came from bins 1 and 2. Bin 2 contains similarly low quantities of other refuse types, consistent with it standing open, eroding, and filling with sands and surface artifact debris, but not refuse-dumping. Bin 1, on the other hand, contains higher quantities of other artifact types, especially ceramics and faunal material, consistent with the bin being open for refuse dumping. The paucity of lithic debitage in Bin 1 remains enigmatic, but could indicate the refuse was from a single or few disposal events that did not include lithic debris.

Both the midden and Structure 1 yield numerous debitage and tools, and their proportions are similar: Tertiary flakes (72% of the midden, 63% of the Structure 1) and primary/secondary flakes (6/15% midden; 8/18% Structure 1).

Of the 24 tools and fragments (Table 1), 10 were found on the surface. The others came from Structure 1 (10) and the midden 1 (4). Projectile points include an Eastgate and a Cottonwood Triangular in the midden, and an Elko Corner-notched and Large Side-notched point in Structure 1. The small area of Structure 1 fill produced biface fragments, a unifacial flake, and a drill. The vast majority of these tools were made of local cherts. One large generic projectile point and one biface fragment were produced from obsidian. This varied tool assemblage and the preponderance of secondary and especially tertiary debitage are all consistent with residential occupation.

Of the 144 ceramic sherds from 42KA4894, 82% are plain wares (Table 2). These include North Creek Gray, Virgin Series whiteware, and Virgin Series grayware. The remaining 26 sherds
### Table 1. 42KA4894 Lithic Artifact Data

<table>
<thead>
<tr>
<th>Feature</th>
<th>Primary Flakes</th>
<th>Secondary Flakes</th>
<th>Tertiary Flakes</th>
<th>Flake Tools</th>
<th>Core</th>
<th>Shatter</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>146</td>
<td>244</td>
<td>1,226</td>
<td>10</td>
<td>2</td>
<td>184</td>
<td>1,812</td>
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<tr>
<td>Midden</td>
<td>23</td>
<td>61</td>
<td>289</td>
<td>22</td>
<td>2</td>
<td>23</td>
<td>420</td>
</tr>
<tr>
<td>Bin 1</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>Bin 2</td>
<td>0</td>
<td>5</td>
<td>25</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>Structure 1</td>
<td>56</td>
<td>130</td>
<td>458</td>
<td>82</td>
<td>4</td>
<td>64</td>
<td>794</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>225</strong></td>
<td><strong>443</strong></td>
<td><strong>2,005</strong></td>
<td><strong>114</strong></td>
<td><strong>8</strong></td>
<td><strong>278</strong></td>
<td><strong>3,073</strong></td>
</tr>
</tbody>
</table>

### Table 2. 42KA4894 Ceramics by Feature.

<table>
<thead>
<tr>
<th>Feature</th>
<th>North Creek Black-on-Gray</th>
<th>North Creek Gray</th>
<th>Virgin Series grayware</th>
<th>Virgin Series whiteware</th>
<th>North Creek Fugitive Red</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bin 1</td>
<td>9</td>
<td>50</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>61</td>
</tr>
<tr>
<td>Bin 2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Structure 1</td>
<td>6</td>
<td>24</td>
<td>23</td>
<td>0</td>
<td>1</td>
<td>54</td>
</tr>
<tr>
<td>Midden</td>
<td>0</td>
<td>13</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>88</strong></td>
<td><strong>25</strong></td>
<td><strong>5</strong></td>
<td><strong>11</strong></td>
<td><strong>144</strong></td>
</tr>
</tbody>
</table>

include 15 North Creek Black-on-Gray and 11 North Creek Fugitive Red. As with the lithic debitage, Bin 2 produced only 9 ceramic sherds of which 8 were North Creek Fugitive Red. While three sherds of North Creek Fugitive Red from Trench 1 were provenienced to Structure 1 and Bin 1, the deposition of most of the Fugitive Red pieces in the fill of Bin 2 suggests a single event. Bin 1 produced 61 sherds of mostly North Creek Gray. Structure 1 ceramics were dominated by North Creek Gray and Virgin Series grayware, the latter too faded or undiagnostic to be placed into types.

### Faunal Remains

The zooarchaeological assemblage is fragmentary, and 60% are too small to identify to size class (average weight .15 g/specimen). Of the identifiable material, 7.5% comes from artiodactyls or artiodactyls-sized animals and 15.7% from Leporids (jackrabbit and cottontail); both are common components of prehistoric diets throughout the region. Direct evidence of human agency in the form of cut marks or burning is limited; only three identifiable fragments showed evidence of burning, and none had cut-marks. Neither is surprising given the small size of the sample and the degree of fragmentation. Nevertheless, given the cultural context and the fact that the site is open, rather than in a cave or rockshelter, the lagomorph and artiodactyl materials are almost certainly cultural in origin.

### Botanical Remains

Ten samples from the midden were floated and only the light fraction of recovered materials was analyzed, given that we did not have occupational floors at this site. All of the samples produced charcoal. Five samples produced Zea mays kernel fragments.

### Interpretation and Discussion

The Two Bin site (42KA4894) reflects three occupations featuring small scale storage and possibly residence consistent with Ancestral Puebloan field houses. No chronometric dates
are available, but the abundant North Creek Gray, and the less frequent North Creek Black-on-Gray and North Creek Fugitive Red are consistent with Pueblo II occupation. The Virgin Series whitewares are so fragmented or faded that more specific identification is difficult.

The evidence indicates the site accumulated in three events: construction of Bin 2, then Bin 1, then Structure 1 and the midden. Of interest in our research design is the tempo of occupation or the elapsed time between occupations. If this time is short, perhaps a few years or a decade, the site could have been reused by the previous occupants. If reoccupation was on the order of several decades or more, then the site may be known more through social memory. The concept of occupational tempo is one facet of settlement patterns for the Virgin Branch Ancestral Puebloan, and seems worthy of attention.

A working model is that Bin 2 was constructed first, used, opened, and filled largely by natural deposition, both aeolian and slopewash. Bin 2 was virtually clean, with only a few dozen pieces of debitage. Bin 2 had an adobe collar, and while it was somewhat eroded, the collar protected the walls, which remained in good condition. This may have contributed to the filling of the bin by providing a trap, but the erosion and natural deposition we observed seemingly could have been produced in perhaps a decade.

Bin 1 was constructed next, about two meters away from Bin 2, and perhaps significantly, both bins have an orientation between 68–70 degrees. The location of Bin 2 may have been evident to the builders of Bin 1, hence the orientation was replicated. After the contents of Bin 2 were retrieved, it severely eroded with the wall slabs slumping into a jumbled mass. The edges of the feature were sloped and dissected from water and wind erosion. Bin 1 appeared to have stood open for perhaps several years prior to the deposition of ashy refuse that included ceramics, bone, and a small amount lithic debitage.

Structure 1 was subsequently constructed and the midden accumulated during this time. Bin 2 was already filled when Structure 1 was constructed, but Bin 1 would have been evident to the later occupants.

We appeal to experimental archaeology to supplement the evidence from the stratigraphic sequence described above to propose a tempo of occupation for the site. Two experimental bins (Figure 5) were constructed nearby and modeled after the excavated storage bins at 42KA4894. Experimental Bin 1 (EB1) was constructed in June 2002, and EB2 was constructed in March 2003. EB 1 & 2 were left open to mimic the decay of prehistoric bins after their contents were retrieved. The pace of erosion of both bins was monitored through March 2004.

The degree of erosion even over a two year span is dramatic. The cross section of EB 1 (Figure 5) reveals an amalgam of slumped clay from the bin walls, and an overburden of slope wash. EB 2 two is a dramatic palimpsest of collapsed wall slabs with an overburden of slope wash and aeolian sands, all occurring within a year after construction. Both bins show some slopewash, but after only two years the bins were only partially filled, and remained obvious depressions.

The Two Bin site, 42KA4894, illustrates that the tempo of occupation varied. After the contents of bins 1 and 2 were retrieved, they may have collapsed in only a few years. The construction and subsequent erosion of Bin 2 spanned perhaps a decade. Bin 2 may have been evident to later occupants who constructed Bin 1. After Bin 1 was opened, it eroded within a few years, and was then used as a refuse dump. Overall, perhaps a decade or two would have been required to fill the bins to the degree we observed in the excavation.

Setting this in human terms, the use of the same orientation for the bins suggests either the same people or descendants returned. The practice of returning to the same site reflects sense of place and memory culture in practice. The exercise at the Two Bin site suggests that tempo of occupation can be ascertained under some circumstances. It would seem profitable for archaeologists to stay attuned to the investigation
of the tempo of occupation, because the temporal
ing of settlement overcomes the problem with
the typological approach to mobility in that
people can be both sedentary and nomadic over
the life history of individuals.

It is intriguing, albeit somewhat musing to
note that the 68–70 degree orientation of the
bins approximates a lunar orientation, the lunar
minor standstill at 67.1°. Lunar orientation with
variation of a few degrees is found in major
buildings in some parts of the Southwest, and
is one of two major astronomical orientation
systems at Chaco Canyon (Lekson 2008:127,
238–239, 293n136, 308n56; Sofaer 1997). The
linear arrangement of Virgin Branch storage bins
and structures has long been known, but there
seems to be little attention to the astronomical
aspects of these orientations. Similarities and
differences in orientations among Virgin Branch
sites could be a window into the cosmological,
and hence identity and kin associations of the
people.

Years or perhaps over a decade after Bin 1
was used, people returned and built Structure
1, depositing the midden. The orientation of
Structure 1 is about 85 degrees, hence closer
to a cardinal, solar/equinox orientation, thus
contrasting in a structured way from the
orientation of the bins. A solar orientation is the
other major system evident in the Four Corners
Southwest.

Perhaps a worthy line of research would be
to catalog astronomical orientations of individual
structures, and arrangements of structures at
Virgin Branch sites as a possible window into
differing cosmological understandings among
the people, and to further integrate the Western Pueblo with the world of the ancient Southwest. This might make an excellent project for a Masters thesis.

The Weeping Juniper Site (42KA4895)

42KA4895, named after a weeping juniper, featured a surface scatter of lithic and sparse ceramic debris, a circular depression suggesting a subsurface structure, and an area of ashy sands and fire-cracked rock. Excavations exposed a wickiup-style structure with a hearth but based on a Southwest floor plan, with a deflector and antechamber/ramp oriented to the southeast. Radiocarbon dates the structure to A.D. 1000–1170, and this age is consistent with the small number of ceramics and arrow points from the site. As with the Two Bin Site, the vicinity of Weeping Juniper was heavily occupied, and this light structure may be in association with other features. Auger sampling found patches of ashy sediments up to 30 cm deep in 7 of 16 auger holes along three transects extending up to 20 m south, and upslope from the structure (Figures 6 and 7).

Excavation

A 1 m wide, 17 m long exploratory Trench 1 was excavated north to south to identify site stratigraphy and bisect the depression suspected of being a structure. Stratum I is the compacted sand of sterile subsoil. Probes and augering indicate Stratum I overlies bedrock. Stratum II is also compacted sands from 0–12 cm thick, but contains ash, charcoal, and artifacts. The absence of a clear contact between Stratum I and II suggests that occupational debris was deposited on a churned, sandy surface. Stratum III is surface blow sand with artifacts and is 3–12 cm thick.

Trench 1 transected the depression and identified Structure 1. Stratum II, a diffuse midden, extends west and north of the structure, and originates at the edge of Structure 1 where the deposits are thinnest. To the north and downslope from Structure 1 Stratum II thickens to 10–12 cm and continues throughout the length of Trench 1. No Stratum II midden is found south and upslope from the structure, indicating that the midden, or at least a portion of it is contemporaneous with Structure 1.

Exploratory Trench 2, extended west to east and confirmed that the structure originates at a 3 cm. thick layer of ashy carbonate-cemented sand laminates at the contact between Stratum II (compacted sands) and stratum III (surface blow sand). The bulk of the artifacts occur at this contact. This surface is associated with Structure 1, but also extends south and upslope from the structure entrance suggesting it was an extensive, hard, and cemented occupational surface at the time Structure 1 was used.

Clearing of Structure 1 revealed a sub-circular, saucer-shaped depression 4.6 m x 5 m in diameter and up to 15 cm deep. A ramp/antechamber feature extended toward the southeast and upslope from the depression. A rectangular sandstone slab 25 cm x 20 cm wide was found at the base of the ramp in a direct line to the hearth, suggesting a small deflector; a diminutive representation of a common arrangement in a wide variety of pithouse forms across the Ancestral Puebloan world. The slab had slumped and alluvial wash built up around it at the base of the ramp.

A fire hearth in the center of the depression is 60 cm in diameter x 3 cm deep, and is deflated and smeared, hence the hearth was likely smaller when in use. An AMS radiocarbon date on small twigs of unidentified wood charcoal from the Structure 1 hearth yields an age of A.D. 1000–1170 (cal. 2 sigma, Beta 161625).

The floor of Structure 1 yielded residential debris including hammerstones, a large quartzite chopper, pecking stones, a scraper, a Bull Creek (or Kayenta?) projectile point (Weder and Sammons-Lohse 1981; Geib et al. 2001:218–219), a small basal-tanged point, point fragments, utilized and retouched flakes, and ground stone fragments. Microlithics indicating tooling were found in the heavy fraction of floor flotation samples. Neither the hearth nor floor yielded
identifiable botanical remains probably due to mechanical erosion of the sands. No ceramics were found on the structure floor, thus ceramics cannot speak to its age.

No post holes are evident at Structure 1, and the absence of burned adobe daub suggests only a light superstructure. While the structure appears to be wickiup in morphology, the antechamber/ramp and deflector indicate a Southwest style floor plan.

The stratum II midden abuts and extends downslope to the north of the structure suggesting it is associated. The midden contained ash, lithic debris, but only a single ceramic sherd of North Creek Corrugated.

Only 18 ceramic sherds were recovered from the site including six North Creek Gray, eight St. George Black-on-Gray, the one sherd of North Creek Corrugated, and three unidentified grayware sherds. Four of the sherds were from the outer edges of Structure 1, but their association with the structure is not clear. These include two sherds of St. George Black-on-Gray, one North Creek Gray, and one unidentified grayware sherd. The paucity of ceramics is interesting, but the small assemblage is consistent with the radiocarbon window of A.D. 1000–1170 from the hearth of Structure 1.

A large 1.2 m x 95 cm deep subsurface pit with a conical bottom that filled intermittently with refuse and natural fill lies within the boundaries of Structure 1. Stratigraphically, the pit originates at the same level as the structure. However, a standard juniper charcoal radiocarbon date of 390–100 B.C. (cal. 2 sigma, Beta 161624) from under a sandstone slab 50 cm deep within the pit indicates it predates the structure; albeit old juniper wood may skew the date making the pit
younger than this age. This suggests the site was occupied more than once, and the possibility of other features nearby cannot be ruled out, although none were seen in the two exploratory trenches.

**Interpretation and Discussion**

At the Weeping Juniper site (42KA4895) we initially aimed to sample a portion of a shallow depression that we expected to be a typical pithouse. Instead we found evidence for a lightweight structure: A subcircular saucer-shaped depression 4.6–5 m in diameter, a maximum of 15 cm deep, and an absence of post holes and burned daub. Without debating what qualifies as a pithouse, Structure 1 is similar to wickiup structures across the Great Basin and Rocky Mountain regions with one significant difference. The floor plan is Southwestern with an antechamber/entry ramp, and significantly,
oriented toward the southeast. A deflector stone is situated between the antechamber and the hearth. While this seems to be unusual for Virgin Branch sites, the orientation is interesting, and a Southwestern cultural designation for this light structure is consistent with the AMS radiocarbon date of A.D. 1000–1170 taken from the hearth.

An associated midden was found north of the structure. It originated on the same surface, and the midden deposits terminated at the edge of Structure 1 suggesting association of at least part of the midden.

Once inside the perimeter of Structure 1 the artifact assemblage resting on the floor became strongly residential. Lithic debris was absent or small over most of the structure interior, except for a cluster of larger (>20 cm) flakes south of the hearth and another cluster at the base of the antechamber/ramp (Figure 8). Archaeological sites left by foragers practicing some cleaning frequently yield this pattern, as do ethnoarchaeological cases. Larger items such as the hammerstones, pecking stones, and ground stone objects are diagnostic of a household context and such debris is typically found along the perimeter of the structure. Most of the large debris in Structure 1 was indeed concentrated near the west edge farthest from the door. A small cluster of hammerstones and debris was also found at the base of the entry ramp with the larger lithic flake debris. No ceramics were found on the structure floor indicating that if vessels were used, they were removed, and that if a vessel had broken inside the structure, the sherds were removed.
By drawing analogies with forager archaeology, we do not imply that foragers occupied this site. Rather, Structure 1 documents a kind of behavior and architecture Southwestern archaeologists would expect for the Ancestral Puebloan; expedient structures, but nevertheless constructed on the same ideological principles as larger, more permanent pithouses. Little by little such structures are becoming known, but can be difficult to locate or easy to overlook when so many obvious features on Anasazi sites vie for our attention.

The Vermilion Vista Site (42KA4896)

42KA4896 is located on a rise, offering an expansive view north toward the Vermilion Cliffs, hence its name. Closer examination after initial survey discovered what appears to be one element of a large site extending beyond SITLA property lines. Our evaluation focused on a 19 m long structure that was a ramada indicated by abundant roof fall and posts. A low masonry and perhaps jacal wall fronted the structure to the south creating an enclosed, covered patio area. Six slab-lined storage bins are associated with, and were partially underneath the roof of the ramada, marking the northern edge of the structure. The interior work space included four hearths and/or roasting pits, four subsurface/bell-shaped pits, four shallow floor pits with small cobbles and artifacts, and an activity area in front and south of the ramada (Figures 9 and 10).

A midden deposited in two stratigraphic units arcs around the eastern flank of the structure and yielded a bone ornament, several small arrow points, abrader stones, and small to medium sized burned mammal bones. There is evidence for plant food processing, possible manufacture of ground stone and lithic tools, and possibly the pre-firing stages of ceramic manufacture.

The structure, wall, and bins are oriented on a 73 degree axis. Stratigraphy and superposition of features, fill, and the formation of the middens indicate the ramada structure and slab-lined bins were constructed in increments. The structure burned twice, likely from wildfire during abandonments, reflecting the incremental occupation. Six radiocarbon dates across the extent of the structure yield a constraining window of occupation between A.D. 600 and A.D. 965, but occupation is most likely toward the end of this range (see section on Chronology and Table 3). This is consistent with ceramics and architecture indicating occupation during Pueblo I and Early Pueblo II times.

Excavation

An alignment of large, up to 30 x 60 cm, well-dressed masonry blocks guided a test trench and eventual identification of the ramada and associated bins and pits. The ramada burned after at least two occupations, sealing the living surface with roof collapse. This circumstance enabled us to trace the distribution of adobe roof fall into and over various features. The slab-lined bins exhibited superposition, remodeling, reclamation of slabs, as well as a small subsurface pit in one bin filled with ash. The bins also exhibited various forms of natural erosion/collapse, refuse dumping, and the abovementioned roof collapse events. Preservation was not as good along the south side of the structure where the adobe roof fall layer thins and erosion now leaves the structure floor only a few centimeters below the modern blow sand. The low masonry wall along the south edge of the ramada was marked by abundant adobe slump and melt.

The roof of the ramada was supported by a line of posts set about 50 cm from the rear edge, with the roof extending partially over the bins, judging from roof-fall. The burnt, butt ends of six of these juniper posts, ranging from 10–20 cm diameter are preserved in the hardened adobe. Four postmolds were found along the south side of the structure and one was subject to radiocarbon dating of the outer layers of the post (Table 3).

Some postmolds near the eastern end of the structure had no remnant posts, while others to the west had the remains of burned posts. Midden deposits covered some of the eastern,
Figure 9. Photo of 42KA4896. Individuals mark features: at left in bins, in center at hearths and pits, and behind midden in background.

open postholes suggesting posts may have been recycled after the first occupation. Further, the midden east of the ramada was deposited in two stratigraphic units separated by a sterile sand layer implying two occupations of the site. A radiocarbon sample was taken from the lower unit of midden with a date of A.D. 700–900, the early portion of the sites occupational range. Ceramics did not chronologically distinguish between the lower and upper occupations.

The alignment of masonry blocks that initially identified the feature during survey was only one course high, but associated adobe chunks/melt patterns suggests it was a footer wall anchoring an adobe (possibly jacal?) wall to create an enclosed, covered patio area. The morphology of the wall can only be speculated upon, but the volume of adobe debris melted from the wall suggests it was low. This would create a wind break along one side of the ramada. Inside and
under the ramada was a hard-packed dirt floor with a variety of features and artifacts.

Four bell-shaped pits (30–35 cm maximum diameter x 30–50 cm deep), two of which produced AMS radiocarbon dates on charred maize kernels, seemed to be remodeled from earlier structural post holes as the structure was rebuilt or added to from east to west.

At the front (south side) of the ramada along the edge of the apparent roof line, were two unlined, circular hearths, and one slab-lined hearth, each 60–80 cm in diameter. The slab-lined hearth produced an AMS radiocarbon date on charred maize kernels (Table 3). Two hearths contained ash/charcoal fill, and one was used to dump slurry of a purplish clay typical of the Chinle formation (available less than 5 km away). It also contained large sections of broken vessels suggesting their use and breakage at the ramada or nearby. Other hearths were outside of the structure to the south in what was probably an open-air activity area in front of the ramada.

![Vermilion Vista Plan View](image-url)

Figure 10. 42KA4896 plan view showing features and locations of radiocarbon samples.
Table 3. 42KA4896 Radiocarbon Samples and Dates.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Material</th>
<th>Provenience</th>
<th>13C/12C</th>
<th>Conventional Age (A.D. 1950)</th>
<th>Calibrated Age (2 sigma)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Beta 171265</td>
<td>Charred maize kernel</td>
<td>Pit 2</td>
<td>-10.8 o/oo</td>
<td>1250+60BP</td>
<td>A.D. 660–900</td>
</tr>
<tr>
<td>2 Beta 171266</td>
<td>Charred maize kernel</td>
<td>Bin 4 floor</td>
<td>-9.2 o/oo</td>
<td>1260+40BP</td>
<td>A.D. 670–875</td>
</tr>
<tr>
<td>3 Beta 171268</td>
<td>Charred maize kernel</td>
<td>Pit 4</td>
<td>-8.9 o/oo</td>
<td>1250+40BP</td>
<td>A.D. 675–880</td>
</tr>
<tr>
<td>4 Beta 171267</td>
<td>Bone collagen</td>
<td>Lower midden</td>
<td>-18.7 o/oo</td>
<td>1110+40BP</td>
<td>A.D. 700–900</td>
</tr>
<tr>
<td>5 Beta 171264</td>
<td>Charred maize kernel</td>
<td>Hearth 2</td>
<td>-10.5 o/oo</td>
<td>1190+40BP</td>
<td>A.D. 720–745</td>
</tr>
<tr>
<td>6 Beta 161626</td>
<td>Outer 1/3 burned juniper</td>
<td>Ramada post</td>
<td>-21.0 o/oo</td>
<td>1360+60BP</td>
<td>A.D. 600–780</td>
</tr>
</tbody>
</table>

The north edge of the structure is defined by a linear arrangement of six slab-lined bins. The bins are similar in size (dimensions described below) with a mean capacity estimated at 57 bushels each. The curvilinear morphology of bins 1 and 2 suggest Pueblo I, while bins 3–6 are rectangular, a form more common in Early Pueblo II times. Judging from roof fall, the ramada extended partially over the bins, making them a defacto north “wall” or edge of the structure.

**Bin 1**

Bin 1 (aligned with Bin 2, but unknown dimensions x .5 m deep) is the easternmost bin, but only partially excavated. The floor was a single layer of slabs. The lower fill consists of ashy sands and occasional charcoal flecks and chunks. No rock rubble was deposited in the bin. Above this level wall slabs were missing suggesting reclamation, but the floor slabs must have already been buried as they are intact. The remaining fill is roof fall.

**Bin 2**

Bin 2 (2.5 m x 1.3 x .75 m deep) is separated from Bin 1 to the east by a 30 cm baulk. This bin is curvilinear suggesting Pueblo I, and thus implying that the earlier Bin 1 is also Pueblo I.
It also had a single-layer slab floor that had been plastered. Bin 2 stood open after abandonment accumulating clean, aeolian sand that became cemented from ponded water in the open bin. Above that was rock rubble in a sandy fill with some ash/charcoal, but few artifacts. No wall slabs had been reclaimed from Bin 2.

**Bin 3**

Bin 3 began as a large (3.3 x 1.75 x .5 m deep) slab-lined bin with a single-layer plastered slab floor. It was built immediately west of Bin 2, but employed a separate wall with a 20 cm baulk between bins 2 and 3. Sometime later, a divider of dressed masonry rather than vertical slabs was added and the eastern half of Bin 3 became filled with considerable dressed masonry rubble, but no ashy refuse, and few artifacts. Use of the west half continued, creating Bin 4. Thus Bin 4 is a smaller bin (1.9 x 1.75 x .5 m deep) using the floor of Bin 3. After use, Bin 4 stood open, accumulating 2–4 cm of aeolian sands, and above that sandy fill with rubble, sparse ash, but with charred maize kernels in two places. One sample of these was submitted for AMS radiocarbon dating (Table 3). Some of the westernmost wall slabs were burned suggesting one portion of the open bin was used as a hearth. In another portion of the bin clay slurry was deposited onto the sandy, but exposed slab floor. In the northwest corner of the bin was dressed masonry rubble with splotches of clay slurry among the rubble. A few artifacts and hearth-ash deposits also comprised the fill of Bin 5 indicating the bin had been used for various purposes before the roof burned and fell massively into the bin. The roof fall extended across the width of Bin 5, but thinned to the north suggesting the roof only extended partially over the bin. A lithic cache of several hundred flakes was found in a shallow 10 cm diameter pit abutting the outside wall of Bin 5.

**Bin 6**

Bin 6 (2.75 x 1.8 x .65 m deep) was the last to be built and required a separate pit to be excavated leaving a sterile baulk between earlier Bin 5 to the east. Wall and floor slabs were double thickness in Bin 6. A small bell-shaped pit with a 10 cm opening, bulging to 18 cm and 50 cm deep intrudes into the floor the bin. The pit was filled with homogenous light gray fine ash and sealed with plaster implying a ritual context. Bin 6 then filled with mostly sterile sands, few artifacts and no midden indicating it filled during an occupational abandonment. However, the final overburden covering Bin 6 does not appear to be roof fall suggesting the ramada did not extend over Bin 6, or had already collapsed prior to its construction.

**Artifacts, Flotation, Microrefuse**

The artifact assemblage on the floor of the structure is dominated by ground stone, with over a dozen metate fragments strewn along the rear edge of the structure near the bins. Small ceramic sherds and small lithic flakes were present, but the floor was relatively “clean.” Many of the lithics occurred in the cache of several hundred flakes adjacent to Bin 5. Exotics from the structure floor include a fragment of polished turquoise likely from a jewelry piece. Also several squash seeds and a bean seed that was incised with a “face” motif. These were found in floor deposits under the roof collapse, additional evidence that the structure was abandoned and stood open for a time prior to burning and collapse.

The characteristics of the ground stone assemblage are informative. Eleven small
pecking and/or abrading stones were found. A whole two-handed mano was found impaled in the floor and partially buried in melted adobe as if it had been stored in the rafters or was sitting on the roof when the structure collapsed. A large slab metate was found face-down on the floor. Over a dozen mano and metate fragments were scattered along the rear edge of the structure, again near the bins.

Flotation samples yielded material in all hearths and subsurface pits, including lithics, turquoise micro shavings, bone, charred maize, charred pinyon hulls, carbonate mineral chunks, and unidentifiable botanicals too eroded or fragmentary to match with our type collection. Microrefuse from the heavy fraction of sediment/flotation samples from the floor of the structure revealed a high frequency of the same stone used to manufacture the ground stone tools at the site. We would expect such debris from the use of discarded grinding stones as heating stones, producing burned spall. However, most of the microrefuse was not burned or fire-cracked. Control samples taken from the nearby Two Bin and Weeping Juniper sites did not yield the same size and abundance of this type of debris as we found at Vermilion Vista. This, along with the frequent pecking stones suggests that ground stone manufacture was one possible activity at the ramada.

It also seems possible that ceramic production may have occurred here, based on the clay slurry dumped in the refuse and the abundant abrading stones.

Sherds from the blow sand and the surface at Vermilion Vista are not reported here because of the diversity of sites of widely varying ages in the vicinity. Ceramics reported here include sherds found under the roof fall, from the fill of the bins, and from upper and lower portions of the midden east of the ramada. The most common types are North Creek Gray (N=177), Shinarump Gray (N=287) both consistent with Early Pueblo II occupation, and Washington Black-on-Gray (N=53), indicating Pueblo I occupation. There are three sherds of Tsegi Orange, and five sherds of North Creek Corrugated, one of which was in the upper midden. Restraint may be best in interpreting these eight sherds, in part because they represent 2% of the ceramic assemblage, and because they are inconsistent with six radiocarbon dates placing the site in Pueblo I and Early Pueblo II times.

**Chronology**

Six radiocarbon dates constrain the occupation between A.D. 600 and A.D. 965. Table 3 identifies the sample data and results, and Figure 10 shows the sample locations. All six ages overlap in a 60 year span from A.D. 720–780. However, Sample 6 was from the outer 1/3rd of a juniper post used to support the ramada, and likely includes a measure of old wood. Considering only the four maize dates and the single bone collagen date, the overlap is A.D. 700–965, consistent with the ceramics and the bin morphology both indicating Pueblo I to Early Pueblo II times.

The presence of a two component midden separated by a thin sterile sand layer argues for two occupations. Radiocarbon sample 4 (Table 3) from the lower midden falls in the early part of the chronology, A.D. 700–900. The ceramics from the midden are overwhelmingly graywares, and there is no statistically significant difference in the ceramic frequencies between the upper and lower midden. The upper midden is superimposed over the burned roof fall of the ramada in the eastern three to four meters of the structure, including over Bin 1. Thus, the first occupation was likely in Pueblo I times and included bins 1 and 2, a ramada, wall alignment, and the lower midden.

The structure floor was devoid of large, or valuable artifacts, suggesting cleaning, but did contain small tools such as the abraders and manos. The site stood open for a time and it is possible that some of the posts were reclaimed because several of the posts near the eastern end of the ramada were missing leaving only postmolds. Then sometime later the ramada burned and the roof collapsed onto the open floor, filling and covering the exposed postmolds.
After another interval of unknown duration, the upper layer of midden was deposited over the roof collapse from the early ramada near its eastern end. This signals a second occupation west of the first, likely Early Pueblo II times. A ramada that was simply an extension of the first was constructed and the rectangular bins 3–6 were added along the same axis as the earlier occupation. The sequence of bin construction, and the reclamation of slabs as the bins were built to the west allows for the possibility of more than one additional occupation, but this remains inconclusive. What is clear is that after the final abandonment, the second ramada burned and collapsed over the remainder of the structure much as it did after the first occupation.

**Interpretation and Discussion**

The remains at Vermilion Vista represent a work area and storage facility. Indeed, the activities represented in the site features and assemblage composition suggest a women’s work area where plant food processing, storage, stone tool manufacture, bead-making, and possible grinding tool and ceramic manufacture occurred. The ramada/work area may have been one element of an Ancestral Puebloan field house supporting labor at nearby agricultural fields.

The residential component associated with the ramada/work area may have been sampled by auger probes and test excavation that located a probable pithouse with a floor about one meter below the surface just east of the midden. The limited excavations there do not provide ceramics or dates for the pithouse so its relationship to the ramada and bins remains unknown.

The ramada, activity areas, and storage facilities at Vermilion Vista are a tangible exhibit of the life of mobile farmers employing a variety of residential bases while moving labor where it is needed (McFadden 1996 and further developed in McFadden 2016:143–144, 172–174). This is the concept of “residential cycling” in the sense of Steadman Upham (1994:123, 131), and further articulated in Simms (2010:59–60, 63, 111). The Virgin Branch Ancestral Puebloan settlement pattern was mobile, not so much nomadic, but featured residential cycling that situated labor onto the land. The location of where labor was needed was structured by the demands of a diversified agricultural system. Residential cycling signals the behavior that occurs on a landscape of apparently sedentary settlements. While the material remains of this kind of system fosters a perception of high mobility, the system was likely much more structured than is captured by the categorical terms of nomadism vs. sedentism (sensu McFadden 1996 and 2016). It is this distinction that raises the significance of the concept of “tempo of mobility” rather than a typological continuum of sedentary to nomadic. Individuals were logistically and socially tethered to a number of communities during their life history and the people traversed a built landscape occupied redundantly by the same people, or by descendants exercising social memory. This was the sustainable farming system of the Ancestral Puebloan; a kin-based “portfolio” of small farmed fields of varying degrees of productivity and risk that could only be managed through the residential cycling of labor.

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our discussions added to the field notes shortly after they left. Thanks guys.

Coming back to the notes from these sites for this Utah Archaeology write-up so many years later reminded me of how strong the feature system is, and how thankful I am to have experienced the nuance, decision-making, and organization of stratigraphic excavation in the Jesse D. Jennings tradition. It had been some years since I excavated Anasazi sites, and all of my experience was in the Four Corners region. But it may be all the experience with forager archaeology that perhaps brings something out of the box to the excavation of Anasazi sites. Of course, all mistakes of interpretation and presentation are mine. Special thanks to the dozens of students who participated in the 2001–2002 field schools, some who continued in archaeology/anthropology including: Buck Benson, Arie Leeflang, Kandus Linde, Kylie Lower, Leticia Neal, Richard Ralls, Katie Simon, and Silvia Smith. Finally, thank you to the students who contributed to the figures and lab analysis to bring this to publication all these years later: Aaron Larson, Tanner Gittens, and Justin Lish.

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