# RESULTS OF TRENCH MONITORING AND SITE BOUNDARY DEFINITION FROM CA-SOL-391 IN GREEN VALLEY, CALIFORNIA

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## ABSTRACT

When geotechnical trenching along a fault zone located a buried site (CA-SOL-391), archaeologists were consulted to advise and to monitor additional trenching. Identified portions of the site are limited to many large storage pits and a housefloor with a central subterranean storage area. A high water table associated with fault shifting has preserved human and archaeobotanical remains in these unusual features. Flexible field methods assisted the identification and documentation of perishable artifacts, and were essential for identifying site boundaries. Situated in areas where buried components are expected, CA-SOL-391 offers an unusual glimpse into past Native American lifeways.

In June of 1994, Holman & Associates were contacted when geologists hired by the City of Fairfield discovered a potential human grave during geotechnical trenching. The geologists were investigating a 120-acre study area to refine the location and map a portion of the Cordelia Fault Zone for part of the environmental analysis prior to development. The grave was one of three exposed, along with bell-shaped storage pits, a housefloor with a central subterranean storage pit, and some other distorted features. No cultural materials were identified at this rare subsurface site, SOL-391, except for this suite of features (Figure 1). The archaeological investigation entailed monitoring the backhoe excavation of remaining exploratory trenches, inspecting open trenches and sidewall trench profiles of previous geological investigations, characterizing the cultural features and burials, and defining the boundaries of SOL-391 (Psota and Clark 1994).

The last five years have seen intense residential growth in Green Valley, though not before Holman & Associates conducted several subsurface archaeological investigations on some of its historical properties. Recent investigations at SOL-315 indicate use between 6500 and 450 years ago. The most frequently recovered artifacts were mortars and millingstones, often associated with graves. The site is attributed to a local expression of the Hultman Aspect of the Mendocino Pattern (Wiberg 1992:138). In contrast, Wiberg attributed contemporaneous use of SOL-355, occupied between 4600 and 400 years ago, to peoples associated with the Berkeley Intrusion. Separate from the midden was a discrete cemetery. Although SOL-355 was contemporaneous with the later occupation of SOL-315, human osteology results and the site's material culture are quite different, conspicuously lacking the large quantities of milling equipment unearthed at SOL-315 (Wiberg 1993a).

SOL-69 was inhabited between 4500 and 1500 years ago. Identified during monitoring of mechanical grading, the remains of a pithouse structure were encountered 110 cm below the surface. It contained a weathered concave base point of Annadel obsidian. Four flotation samples contained mainly manzanita, acorn, and wild cucumber. The site contained characteristics associated with both Hultman and Berkeley expressions (Wiberg 1992).

Another nearby site, SOL-356, is a shell-rich, mounded midden deposit with housefloor and ash/pit features. Excavations through the

housefloor were unsuccessful in locating any subterranean storage pits. Bay mud was encountered only a short distance below this floor. The site is attributed to late Phase I and early Phase II of the Late Period (Wiberg 1993c; Bieling 1996).

Approximately 3/4 of a mile southeast of the study area is SOL-25. It is situated on a hill and extends down the slope to a toe. Use of mechanical earthmoving equipment allowed identification of the site boundaries of a rich shell midden, covered in places by over a meter of noncultural deposits (Wiberg 1993b). This portion of the site was attributed to the Late Period based on the recovery of a serrated point. Upland portions of SOL-25 are thought to be earlier.

### Description of SOL-391

Geological descriptions for SOL-391 are based on interpretations by Harlan Tait Associates (HTA), San Francisco of two borings, previous geological research and 13 backhoe trenches that were 1 m wide and approximately 3 m deep, totaling 782 linear m (a portion of these are depicted in Figure 2). The Cordelia Fault zone branches just south of the site with 2 minor traces either cutting through or framing SOL-391. These traces were characterized by open fissures, each discharging about 10 gallons of water per minute.

The geologists divided the stratigraphy into Upper and Lower Sequences. The Lower Sequence consists of various layers of blueish grey clayey sand (HTA 1994:14) or what archaeologists call gravely "bay mud." The geologists described it as "Late Pleistocene alluvial deposits overlain by near shore estuarine deposits estimated at approximately 120,000 YBP" (HTA 1994:11). These deposits are depicted as "IV" in feature figures. The Upper Sequence was divided into 4 "units." The lowest of these, III , consists of an "olive brown to grayish brown silty and sandy clay" (HTA 1994:15). This is overlain by a "yellow red to yellow brown sandy clay with a distinctive and generally continuous manganese oxide zone at the top," or II (HTA 1994:15). All of SOL-391's cultural features were dug into and capped by this deposit, becoming part of the sedimentary regional record. The geologists interpreted this sediment as a paleosol and as the stratigraphically highest and youngest unit involved in faulting. The top two units consisted of gray to yellowish brown silty clay and were grouped as I for feature drawings. This deposit is identified as Clearlake Clay on local soil survey maps (Bates 1977:Map 29, 16).

The high water table, a byproduct of this fault zone, complicated geologic and archaeological mapping of deposits and features. During excavation, water seepage was encountered frequently between a depth of 1.5 and 3 m. Overnight the trenches would fill to within 70 cm of the surface. Trenches to be documented each day would be pumped out one at a time. While geologists and archaeologists documented the trenches, a pump continually extracted water. Since archaeological features were not as compact as the surrounding sedimentary deposits, continued pumping greatly increased the chances of their collapse. Although hydraulic shoring was installed for safety, we were limited to probing about 10 to 15 cm into each feature.

From the 18 geological trenches excavated to date within the 120-acre project area, 4 contained cultural features. One of these was geologically excavated about 5 years ago and included 2 bell-shaped storage pits identified from trench sidewall profiles. Of the trenches excavated during this project, 3 contained cultural features (Figure 3). Please keep in mind that no cultural materials were found outside of the following features.

One geotechnical trench exposed many features and 2 graves. Burial 1 consisted of an adult patella and several conjoining cranial fragments from either a flexed burial or partial cremation (Figure 4). The water, high in alkali, had turned all vegetal and human remains black making specific identification difficult. A tool made from local basalt, 2 small interior flakes of Napa Valley obsidian, and an unburnt Valley Oak acorn were also identified. Burial 2 yielded the remains of an adult, probably more than 35 years

old (Hager 1994), and appears to be a secondary cremation (Figure 5). A large oblong groundstone artifact, minimally modified, was found next to the individual.

The trench containing these 2 burials, was 69 m long and also included 2 storage pits (Figure 6). Pit 1 was the only feature that contained more than one fill episode. The narrow pit's initial fill material contained many Valley Oak acorns with a high concentration of other vegetation. The remaining fill was a clay mixture containing grass; this was similar to the fill material found in all other features. The wider Pit 2 also contained many Valley Oak acorns.

There were several miscellaneous features impacted by this trench. Where the backhoe excavated through a feature would depend on the different profiles in one or both sidewalls. Most were various cross-sections of storage pits with no evidence of graves. Between Burial 1 and Storage Pits 1 and 2, a feature was cut directly by the minor fault trace. The distorted feature may be the remains of a housefloor with a subterranean storage pit.

Another trench, approximately 30 m north, contained Burial 3, the first feature found during archaeological monitoring (Figure 7). It extended into both walls of the trench. The burial pit was marked by a cluster of rocks centered over the grave. The grave was of an adult and was probably in a loose flex position lying on the right side. The person was placed on a thick matting of tule, approximately 7 cm thick and was covered with a thin layer of tule. Lying on top of the innominate was an elk scapula tool. Between the bone tool and innominate were basketry fragments. The basket was of single twined construction with a split weft, pitched down to the right. Mrs. Mary Mae Norton, our Native American adviser, suggested that the bone tool may have been used for collecting grass seeds and other similar activities and that the tule mat was used to draw sickness away from people who were ill. In the southern San Joaquin Valley, native peoples "kept a deer or elk shoulder blade among the cooking utensils and used it for scraping the hardened acorn mush out of baskets and for other jobs like that" (Mayfield 1993:51). The basket was the approximate size of a small serving or personal food bowl.

Approximately 30 m south of Burial 1, another trench exposed a housepit with a central subterranean storage pit (Figure 8). The housepit was covered with a thick layer of ash. The base of the storage pit, again, contained Valley Oak acorns.

Preliminary flotation results from the housefloor and storage pit are provided by Eric Wohlgemuth (Table 1). He believes that the plant remains from SOL-391 are extraordinary, being the only known case of unburnt seed remains preserved in a cultural context for open sites in Central California. Unburnt seeds of clear cultural origin are very abundant at this site, and are dominated by knotweed, an unidentified member of the sunflower family, and Valley Oak acorns. Lesser amounts of Farewell to Spring, unidentified grass seeds, and dock were also identified. Burnt seeds were much less abundant and less diverse, consisting of Farewell to Spring, bedstraw, and unidentified grass seed fragments. Flotation samples from the housefloor and storage pit yielded similar results with the storage pit containing more acorn nutshells.

According to California's Alquist-Priolo Act, fault zones active in the last 11,000 years require additional geological testing and an appropriate building setback. When it was determined that this portion of the Cordelia Fault was less that 11,000 years old, mainly due to the archaeological documentation of these cultural features, then an approximate 30 m building setback was established surrounding the minor and major fault traces (Figure 2). This setback conveniently protects most of SOL-391 from construction impacts for thousands of years.

Geotechnical trenching established the southern and eastern boundaries of SOL-391. The northern portion of the site is somewhere under Mengels Road based on Wiberg's 1992 monitoring north of the road. To identify the western portion of the site, a Gradall excavator, under the supervision of Mrs. Norton and myself,

dug 2 trenches approximately 46 m long. In both cases, bay mud appeared in the bottom of the trench. This part of the investigation was limited to site boundary definition. If the top of a feature had been encountered, excavation would have stopped and moved to another area of the trench, but no features were identified.

## Conclusions

The most elusive part of this site has been determining its age because no morphologically diagnostic artifacts were recovered. The only 3 obsidian flakes submitted for obsidian hydration analysis yielded inconclusive results. A portion of an unburnt branch of either Grey or Knobcone Pine obtained from the flotation sample was submitted to Washington State University for Carbon $^{14}$ analysis. It has provided a date of 1380 years BP +/- 170 years. This places the site in terminal Berkeley or early Late Period.

In the northeastern United States, archaeobotanical samples have been employed exclusively to date a site by the characteristic use of certain items (Asch and Asche Sidell 1988). The absence of seeds from introduced plants indicates that the housepit feature predates the Protohistoric Period. Based on years of analysis, Wohlgemuth (1996a, 1996b) has found that only Late Period sites in central California contain both abundant acorn and small seed remains. This suggests that SOL-391 dates to the Late Period.

Typically subsurface components are thought to reflect periods of sustained use; this is not the case with SOL-391. This site represents probably a brief but intense use of Green Valley. It took a great deal of effort by former site occupants to excavate these storage pits. Once utilized for storage, it appears some pits were then enlarged and used for graves. In an area as well populated as Green Valley, SOL-391 may have served as a specialized storage area with limited residential facilities. Within one mile of this site, there were 2 Late Period middens, SOL-25 and 356, where a wider range of residential activities are represented. Interestingly, archaeobotanical results from SOL-356 yield different quantities of burnt seeds, but overall it was the most similar archaeobotanical sample taken from a Green Valley site. Additionally, no other site has been found to contain the remains of a burnt housepit structure.

Of the 27 different taxa identified during initial ethnobotanical analysis, only 2, fiddle neck and brome grass, are not typically associated with consumption. The richness of the unburnt seed constituents, and the presence of a limited burnt assemblage is a rare event. SOL-391's plant remains offer an unparalleled research opportunity to assess which seeds recovered carbonized in sites throughout central California represent valuable stored resources, and which ones were not as valued or perhaps not even used. The seeds from SOL-391, in conjunction with the well-studied burnt seed assemblages from 4 other nearby Green Valley sites, will provide an opportunity to assess the biases in the central California archaeobotanical record (Wohlgemuth 1996).

To conclude, archaeologists working in concert with geologists strengthen the interpretations of both studies. Use of long trenches exposed features that we would probably not have found with the standard 1x1 m units. If blading had occurred, archaeological monitoring would have identified the graves from the presence of bone, missing the subtler upper portions of these reused pits and probably all other features. While not recommended for use around burials, the geotechnical trenches excavated by backhoes provided a unique opportunity to view Native American empheral cultural features.

Archaeologists and planners have recognized that Green Valley contains subsurface cultural deposits. Prior to the documentation of SOL-391, these buried components were found only in association with nearby surface components. In northern California, discarded lithics comprise most Native American sites, but SOL-391 included no such cultural layer. This probable single-component site contained unusual or infrequently identified intact features and graves. The high water table associated with the Cordelia Fault and its high

content of alkali has preserved vegetal and human remains in an anaerobic environment yielding artifacts and archaeobotanical residues typically identified in intertidal areas or caves (Byram 1995; Thomas 1985).

### Note

As with most CRM investigations, a number of people helped make this project possible. They include: Erin Beavers, Fairfield's Senior Planner; Miley Holman for providing the funding for an accelerated $C^{14}$ sample; Eric Wohlgemuth for his initial ethnobotanical research, including Table 1; and David Bieling for computerizing graphics.

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Table 1. Ethnographic Use, Seasonal Availability, and Habitats of SOL-391 Charred Plant Taxa

| Taxon | Common Name | Growth Habit* | Habitats* | Ethnographic Use** | Seed Seasonal Availability** | Disturbance Follower?*** |
|---|---|---|---|---|---|---|
| Aesculus californica | Buckeye | Shrub | Shaded slopes & canyons | Nuts eaten | Fall | ?? |
| Amsinckia sp. | Fiddleneck | Herb | Open grasslands | None noted | Late spring | Yes |
| Arctostaphylos sp. | Manzanita | Shrub | Dry slopes & flats | Berries eaten | Summer (fall)**** | ?? |
| Bromus sp. | Brome grass | Grass | Varied | Seeds eaten | Late spring | Yes |
| Calandrinia sp. | Red Maids | Herb | Disturbed areas | Seeds eaten | Late spring | Yes |
| Chenopodium sp. | Goosefoot | Herb | Dry slopes & plains | Leaves eaten | Spring or summer | Yes |
| Clarkia sp. | Farewell to spring | Herb | Varied, grasslands | Seeds eaten | Late spring/early summer | Yes |
| Claytonia sp. | Miners lettuce | Herb | Shaded or open grasslands | Leaves eaten | Spring | Yes |
| Galium sp. | Bedstraw | Herb | Varied | Leaves for medicine | Late spring/summer | No |
| Hordeum sp. | Wild Barley | Grass | Varied, open grasslands | Seeds eaten | Late spring | Yes |
| Madia sp. | Tarweed | Herb | Varied, grasslands | Seeds eaten | Summer (fall) | Yes |
| Marah sp. | Wild cucumber | Vine | Varied, shade areas | Seeds for medicine, beads, sometimes eaten | Summer | ?? |
| Phalaris sp. | Maygrass | Grass | Moist places | None noted | Summer | No |
| Polygonum sp. | Knotweed | Herb | Moist places | Eaten green; root for poultice | Summer | No |
| Quercus sp. | Oak | Tree | Varied | Nuts eaten | Fall | ?? |
| Ranunculus sp. | Buttercup | Herb | Varied, moist areas | Seeds eaten | Late spring | No |
| Rumex | Dock | Herb | Varied, moist areas | Seeds & leaves eaten; roots for medicine | Most species summer, few late spring | Yes No |
| Scirpus sp. | Tule | Herb | Marshes or meadows shoots eaten | Roots & leaves for textiles; roots & | Summer | |
| Umbellularia californica | Bay | Tree | Moist canyons, riparian zones | Nuts eaten | Fall | ?? |
| Vulpia sp. | Fescue grass | Grass | Dry open places, grasslands | Seeds eaten | Late spring | Yes |

* Munz 1968; Hickman 1993.
** Barrett and Gifford 1933; Bocek 1984; Chestnut 1902; Dubois 1935; Duncan 1963.
*** Stebbins 1965; Timbrook, Johnson and Earle 1982; and personal communications Michael Barbour, John Menke, Grady Webster, John E. Keeley, and Fred Hrusa.
**** Parentheses indicates secondary period past peak season.

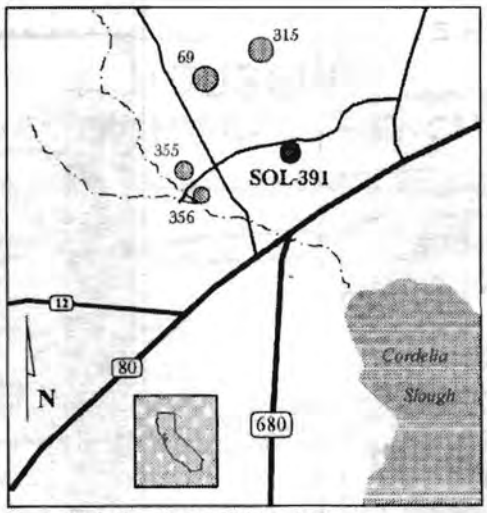

Figure 1. Archaeological Site Locations

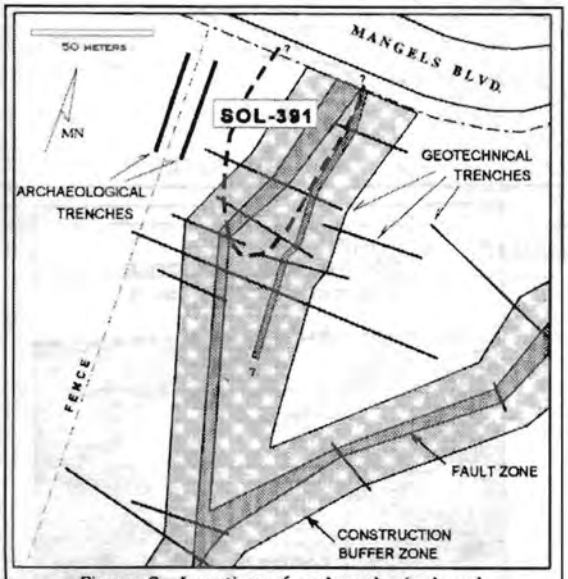

Figure 2. Location of archaeological and geotechnical trenches at Sol-391

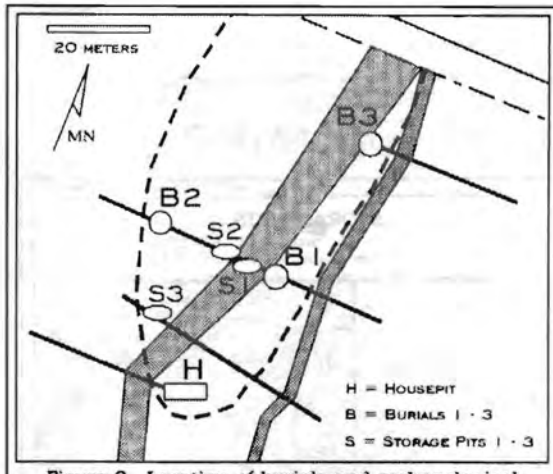

Figure 3. Location of burials and archaeological features at Sol-391

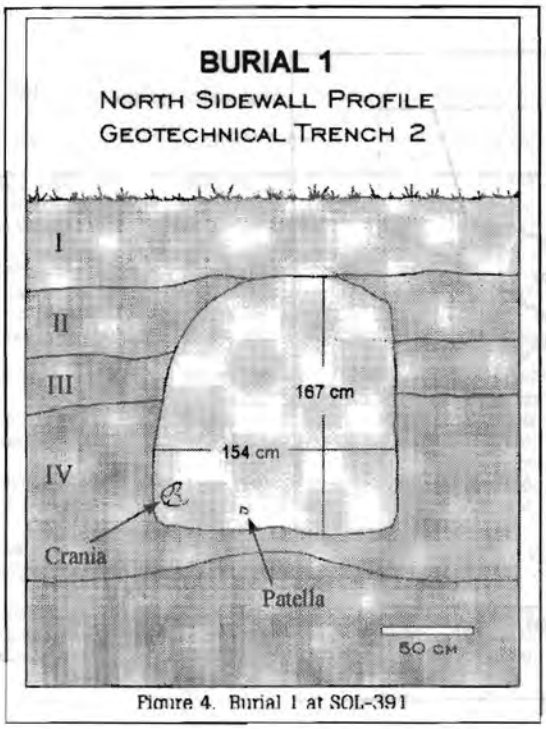

Figure 4. Burial 1 at SOL-391

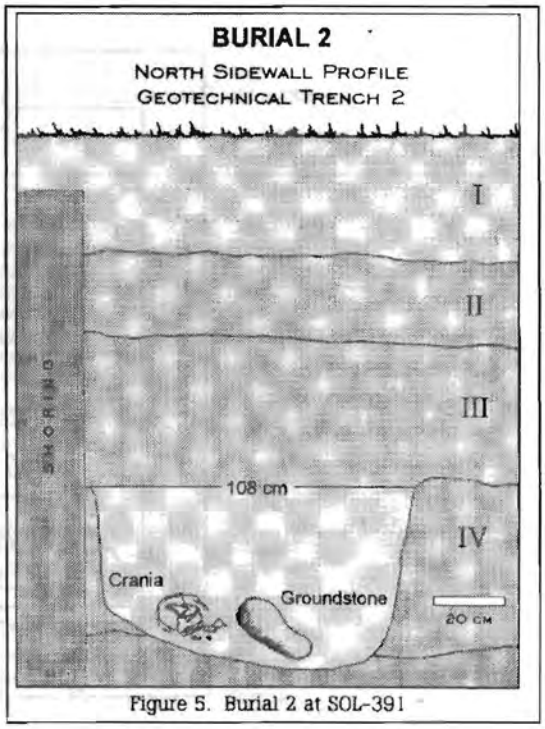

Figure 5. Burial 2 at SOL-391

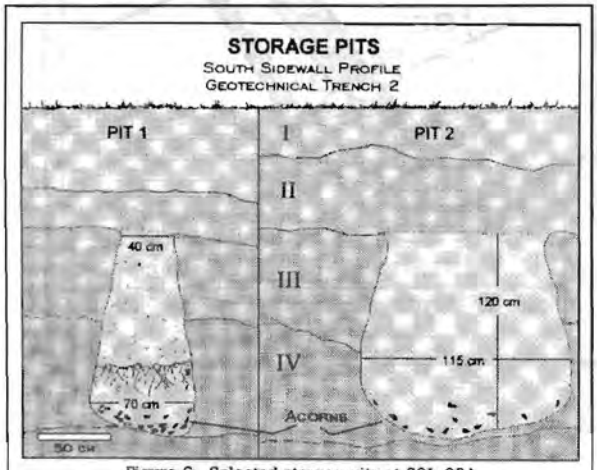

Figure 6. Selected storage pits at SOL-391

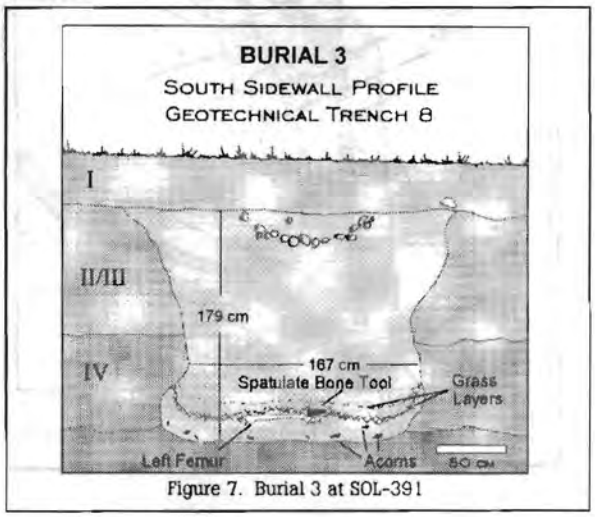

Figure 7. Burial 3 at SOL-391

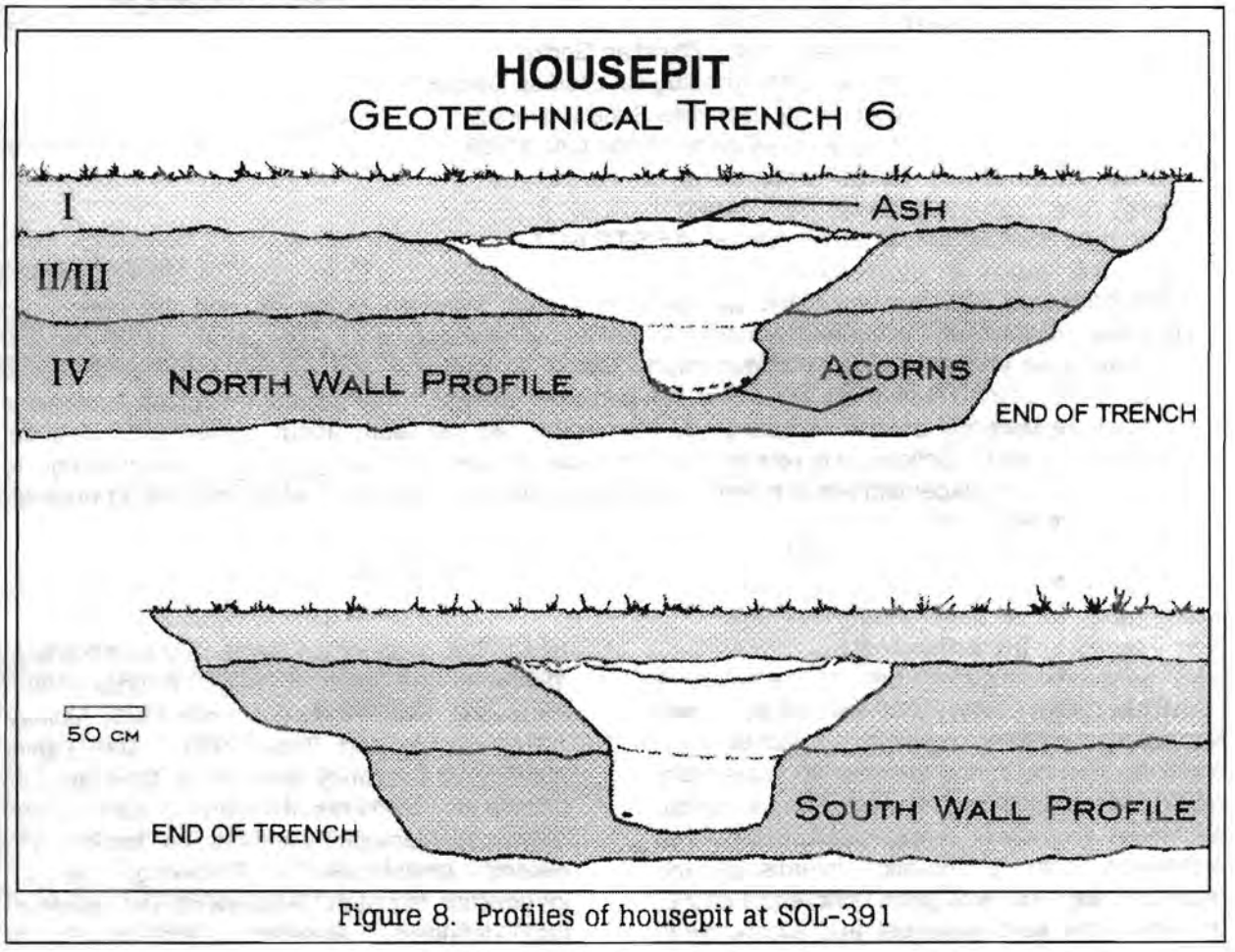


Figure 8. Profiles of housepit at SOL-391