Chapter 18. Site 36LU287 (GAI Site 11)

Phase Ib
Location: West Alternative, Section 21
Site Type: Mid 19th Century Historic Artifact Scatter
Site Size: 10x20 meters (33x66 feet)
Recommendations: Not NRHP Eligible/No Further Work

Site 36LU287 (Site 11) consists of a small, low-density historic artifact scatter situated at the foot of a wooded hill above a broad upland flat in the West Alternative, Section 21 (see Figure 1-3, Figure 18-1, Photograph 18-1). It lies 100 meters (330 feet) west of a bend in Confers Lane, at an elevation of 680 feet amsl. Cultivated fields border the northern and western edges of this woodland (Figure 18-2). A barn/silo foundation included within Site 36LU283 (Locus 1) is located 85 meters (280 feet) to the northeast of Site 36LU287, opposite a gravel farm lane. Based on Phase Ib investigations, Site 36LU267 has dimensions of 10x20 meters (33x66 feet). Proposed project impacts will result from use of this locality as a laydown area.

Photograph 18-1. Site 36LU287* showing *Shovel Testing in Woodlands, Facing North

Cartographic review of maps and aerial photographs of the project vicinity dating from 1873 through 1969 revealed that no structures were depicted in the area of Site 36LU287 (Figures 18-3, 18-4, 18-5, and 18-6).

Phase Ib investigations consisted of systematic 15-meter interval shovel testing followed by radial shovel testing (see Figure 18-2). Of the 11 STPs excavated in the site vicinity (two 15-meter STPs and nine radials), three positive STPs produced 23 historic artifacts.

Shovel tests in Site 36LU287 exposed an A-B soil horizon sequence. As described for STP J3, the soil profile included a 28-cm (0.9-foot) thick brown silt loam A horizon superimposing a yellowish-brown sandy loam B horizon (Figure 18-7). No clear plowzone was identified in this wooded area. Historic artifacts were recovered exclusively from the A horizon.

The small assemblage of 23 artifacts from Site 36LU287 consists of one cut nail and 22 Kitchen-related ceramics (redware, whiteware and yellowware sherds) (Table 18-1). The assemblage contained five temporally diagnostic artifacts, including one cut nail (ca. 1790-1890), one hand-painted whiteware (1840-1860), and one yellowware (1830-1900), as well as

whiteware sherds with a manufacturing date extending to the present. Based on the results of artifact analysis, this site appears to date to the mid-nineteenth century (Table 18-2).

Table 18-1. Site 36LU287: Pattern Analysis, Historic Artifacts

Class	Sub-Class	Ware Type/Object	Count	Percent
Architecture	Nails, Spikes, etc.	nail, cut	**1**	**4.35%**
Kitchen	Ceramics	redware	15	65.22%
		whiteware	6	26.09%
		yellowware	1	4.35%
		Kitchen Total	**22**	**95.65%**
		TOTAL	**23**	**100.00%**

Table 18-2. Site 36LU287: Dating Analysis, Historic Artifacts

Material	Description	Count	Begin Date	End Date	Reference
nail, cut		1	1790	1890	Nelson 1968
whiteware	hand painted	1	1840	1860	Lofstrum et al 1982; Majewski & O'Brien 1984
whiteware	plain	2	1830	2008	Price 1979: Noël Hume 1980
yellowware	plain	1	1880	1900	Ketchum 1987
	TOTAL	**5**			
	Mean date	**1884**			

Site 36LU287 Recommendations

Site 36LU287 represents a small, low-density, mid 19th century artifact scatter. The integrity of this site is good. Because of its small size, low density, and lack of associated features or structures GAI concludes that the potential for Site 36LU287 to contribute important information on the historic utilization of this area is low. GAI recommends that Site 36LU287 is Not Eligible to the National Register under Criterion D. No further archaeological investigations are recommended for this site. GAI provided preliminary results of Phase Ib survey in the Phase Ib Management Summary and in their March 2, 2009 review letter (see Appendix A), the PHMC-BHP concurred with these recommendations for Site 36LU287.

Figure 18-1. Site 36LU287 Location

REDACTED Figure 18-1
Site 36Lu287 Location

Figure 18-2. Site 36LU287 showing Phase Ib Testing Locations

REDACTED Figure 18-2
Site 36Lu287 showing Phase Ib
Testing Locations

Figure 18-3. Site 36LU287 Vicinity in 1939

REDACTED Figure 18-3
Site 36Lu287 Vicinity in 1939

Figure 18-4. Site 36LU287 Vicinity in 1955

REDACTED Figure 18-4
Site 36Lu287 Vicinity in 1955

Figure 18-5. Site 36LU287 Vicinity in 1959

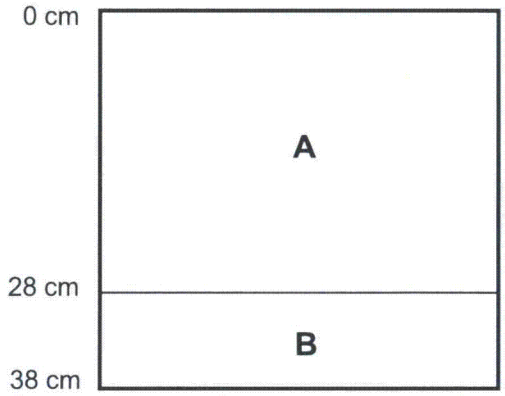
REDACTED Figure 18-5
Site 36Lu287 Vicinity in 1959

Figure 18-6. Site 36LU287 Vicinity in 1969

REDACTED Figure 18-6
Site 36Lu287 Vicinity in 1969

SITE 36LU287

STP J3



KEY:

A – BROWN (10YR 4/3) SILT LOAM

B – YELLOWISH BROWN (10YR 5/4) SANDY LOAM

SCALE

0 m 0.2 m 0.4 m

gai consultants

DWN	LMD	CHKD	TJN
APPD	BAM	DATE	09/04/08
SCALE	AS NOTED		
DRAWING NUMBER	C080204.10.002.C.A.Si 11		

FIGURE 18-7. SITE 36LU287: REPRESENTATIVE PHASE Ib SOIL PROFILE (STP J3)

BELL BEND NUCLEAR POWER PLANT

UNISTAR NUCLEAR DEVELOPMENT, LLC.

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Chapter 19. Site 36LU288 (GAI Site 5)

Phase Ib and Phase II
Location: Area 7, Section 2
Site Type: Multicomponent Paleoindian, Late Archaic, Terminal Archaic/Early Woodland and Late Woodland Occupations
Site Size: 152x260 meters (500x850 feet)
Recommendations: Near-Surface Component Not Eligible/ No Further Work; Deeper Deposits Not Impacted and Not Evaluated

Site Setting

GAI conducted Phase Ib survey and a Phase II National Register site evaluation of Site 36LU288 (Site 5). Site 36LU288 is a prehistoric site located on a low terrace/floodplain, approximately 90 meters (300 feet) west of the North Branch Susquehanna River, in Area 7, Section 2, in the northeast corner of the project area (see Figure 1-3; Figure 19-1). Measuring 152x260 meters (500x850 feet), this site occupies the eastern portion of a large cultivated field bounded by woodlands to the north and east, a line of trees marking the field border to the south, and the North Branch Pennsylvania Canal to the west (Photographs 19-1 and 19-2). A narrow grassy strip separates the eastern portion of the field, containing the site, from the western portion. The low terrace/floodplain landform is transected by series of shallow, northwest/southeast oriented swales, representing former stream channels or flood chutes; two of these swales bisect Site 36LU288. Surface disturbance within the site area primarily results from cultivation, as well as from possible erosion and/or redeposition within the swales. The wooded area immediately east of the site contains walking trails associated with the PPL Riverlands Park and disturbances including a push pile disturbance and installation of a gas pipeline. At the time of Phase Ib fieldwork in 2008, the field had been recently plowed and disked and was planted in corn (Photograph 19-3). The site area was again freshly plowed and disked prior to the start of GAI's 2009, Phase II testing (see Photographs 19-1 and 19-2).

Photograph 19-1. Site 36LU288: Overview of Phase II Plowed Field, from Southwest Corner of Site, Facing North

Photograph 19-2. Site 36LU288: Overview of Phase II Plowed Field, from Northeast Corner of Site, Facing Southwest

Photograph 19-3. Site 36LU288: Phase Ib Shovel Testing in Southwest Corner of Site, showing Corn Crop, Facing Northeast

Background research indicated that previously-recorded prehistoric Site 36LU51 was mapped at the northeastern corner of this field (Area 7, Section 2), in the area of Site 36LU288. Site 36LU51, documented as a small Woodland/Late Woodland period site, was identified during the 1980 survey of the SSES floodplain (Hayes et al. 1981). Based on a review of GAI's Phase Ib survey results for this locality, PHMC-BHP concluded that Site 36LU288 represents a separate prehistoric site (not an extension of Site 36LU51) and assigned it a new site number (October 7, 2008, phone consultation with Noel Stratton/PHMC-BHP). Although mapped within corner of Area 7, Section 2, Site 36LU51 is likely situated just outside the northeastern boundary of the project APE.

Based on the results of GAI's Phase Ia investigation, this low terrace/floodplain setting adjacent to the Susquehanna River has a moderate to high potential for both near surface and deeply buried cultural resources (see Figure 1-3). Proposed project impacts within the site area will consist of use as a temporary construction lay-down area, with impacts extending to a depth of up to 15 to 18 cm (0.5 to 0.6 feet) below surface. An April 8, 2008 phone conference with Steve McDougal (PHMC-BHP), confirmed that due to the shallow depth of proposed project impacts no deep testing would be required in this locality and that excavations would extend to a maximum depth of 80 cm (2.6 feet) below surface. Accordingly, as approved by PHMC-BHP, Phase Ib and Phase II field investigations in the vicinity of Site 36LU288 were limited to the upper approximately 80 cm (2.6 feet) of the soil profile.

Phase Ib Investigations

Phase Ib Methods and Results

Site 36LU288 was identified in June 2008, during Phase Ib survey of the large cultivated field comprising Area 7, Section 2 (Figure 19-2). Field investigations consisted of pedestrian ground survey, surface collection, and both judgmental and systematic shovel testing—extending to a depth of approximately 80 cm below surface (as per PHMC-BHP directions noted above). GAI conducted pedestrian ground survey of the field along transects spaced at 15-meter intervals. Observed surface artifacts were marked with pin flags. A grid was then established over this locality using a compass and tapes. Due to the dispersed nature of the artifact scatter, individual surface artifacts were point provenienced within the site grid rather than being collected within 5-meter blocks. A total of 29 prehistoric surface artifacts were found in a low-density scatter, with the majority located in the northeast and southeast portions of the field; a dispersed scatter of 67 historic artifacts was also recovered Eight judgmental STPs were excavated within the field—four in the corners of the field and four in proximity to areas of higher surface artifact density. Only two of these judgmental STPs were positive, producing three prehistoric lithics.

In an attempt to more clearly define boundaries of the dispersed artifact scatter and to identify the location of previously-recorded Site 36LU51, 15-meter-(50-foot) interval shovel tests were initially excavated in the northeast corner of the field (the mapped location of Site 36LU51). When these shovel tests yielded no artifacts, the grid of 15-meter (50-foot)-interval shovel tests was expanded, with systematic shovel tests ultimately being excavated throughout nearly the entire eastern portion of the field. GAI excavated 126 15-meter-interval STPs within Site 36LU288, for a total of 134 Phase Ib shovel tests. Fifteen STPs were positive, yielding 19 prehistoric artifacts (3 from judgmental STPs and 16 from systematic STPs). Shovel test artifact densities were very low, ranging from one to three artifacts per STP. A loose cluster of positive STPs occurred in the center of the field; positive STPs were also found in its southeast corner and along the field's eastern edge. The location of positive STPs did not closely correspond to the areas of higher density for surface artifacts.

Shovel testing revealed an Ap-B soil horizon sequence (Figure 19-3). The Ap horizon varied in thickness from approximately 40 to over 70 cm in thickness, with the areas of deepest plowzone representing infilled, former stream channels. As described for STP A1, located in the northeast corner of the site, the typical profile included a 44-cm-thick brown silt loam Ap horizon and a yellowish-brown silt loam B horizon (see Figure 19-3). STP A15, located in the southeast corner of the site, exposed a 71-cm-thick plowzone, likely representing a former stream channel that is no longer visible on the surface. STP E9, excavated in the site's east-central portion consisted of a 40-cm-thick dark-grayish-brown Ap horizon and a yellowish-brown silt loam B horizon (see Figure 19-3). Artifacts were recovered from Ap horizon contexts, as well as from the surface. No cultural features were identified.

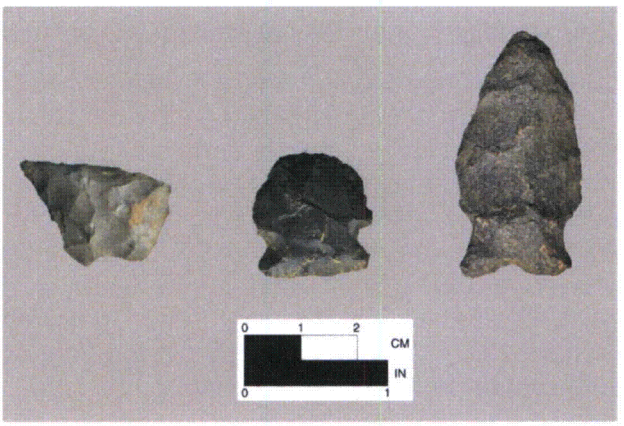
Phase Ib Artifact Analysis

Phase Ib investigations yielded 48 prehistoric lithic artifacts and 34 historic artifacts. The lithics consisted of 10 bifaces, 1 uniface, 36 debitage and 1 core (Table 19-1). Lithic analysis identified ten raw material types in the assemblage, including seven varieties of chert, as well as rhyolite, Bald Eagle jasper, and chalcedony. Black chert was used to manufacture over half of the recovered artifacts (54 percent), while gray chert and dark-gray chert each accounted for ten percent of the assemblage.

Table 19-1. Site 36LU288: Phase Ib, Crosstabulation of Artifact Type by Raw Material

Raw Material	Biface	Core	Debitage	Uniface	Total	%
Bald Eagle Jasper (red)			1		1	2.08
Black Chert	4	1	21		26	54.17
Blue-Gray Chert			3		3	6.25
Chalcedony			1		1	2.08
Dark Gray Chert	1		3	1	5	10.42
Gray Chert			5		5	10.42
Gray Grainy Chert	1		1		2	4.17
Gray Translucent Chert			1		1	2.08
Light Gray Opaque Chert	1				1	2.08
Rhyolite	3				3	6.25
TOTAL	10	1	36	1	48	100.00

The sample of ten bifaces includes three temporally diagnostic projectile points—one untyped Paleo point base (FS 12) made of light gray opaque chert and heavily reworked on its broken distal edge; one Late Archaic Brewerton corner-notched point (FS 32) manufactured from black chert; and one Terminal Archaic to Early Woodland Frost Island or Orient Fishtail point (FS 11) made from a gray (grainy) chert (Photograph 19-4). (Note that FS 12, tentatively identified as an Early Archaic specimen during preliminary analysis, has been reinterpreted based on completion of artifact analysis.) The remaining seven bifaces or biface fragments are nondiagnostic specimens. The single uniface (FS 4) was a utilized flake manufactured from dark-gray chert. The core (FS 37) is a freehand specimen made from black chert. These artifacts will be discussed in detail in the following Artifact Analysis section of this chapter. Based on the Phase Ib diagnostic artifact sample, Site 36LU288 was concluded to represent the remains of Early Archaic, Late Archaic and Terminal Archaic/Early Woodland occupations.



Photograph 19-4. Site 36LU288: Phase Ib Diagnostic Projectile Points

(left to right): Untyped Paleo Base (FS 12), Late Archaic Brewerton Corner Notched (FS 32), and Terminal Archaic/Early Woodland Frost Island or Orient Fishtail (FS 11)

A dispersed scatter of 34 historic artifacts was also found on the surface of the plowed field within Site 36LU288. These artifacts consist largely of kitchen-related materials (23 bottle/jar glass fragments, 5 ceramics, and 1 table glass) along with two pieces of window glass and three fragments of metal. These specimens represent a field scatter associated with cultivation of this landform; they do not represent an historic archaeological site.

Table 19-2.Site 36LU288: Phase Ib Historic Artifact Pattern Analysis

Class	Sub-Class	Ware Type/Object	Count	%
Activities	Hand Tools	crescent wrench, fragment	1	2.94%
	Misc. Hardware	hook	2	5.88%
		Activities Total	**3**	**8.82%**
Architecture	**Window Glass**	**window glass**	**2**	**5.88%**
Kitchen	Bottles/Jars	beer bottle	1	2.94%
		bottle glass	21	61.76%
		jar glass	1	2.94%
	Ceramics	redware, unglazed	4	11.76%
		redware, glazed	1	2.94%
	Decorative Table Glass	glass tableware	1	2.94%
		Kitchen Total	**29**	**85.29%**
		TOTAL	**34**	**100.00%**

Based on the results of Phase Ib investigations, GAI concluded that Site 36LU288 had a potential to yield diagnostic artifacts and cultural features that could contribute important information on the area's prehistoric use. GAI recommended that Site 36LU288 was potentially eligible for listing in the NRHP and recommended either site avoidance by proposed construction or Phase II testing to evaluate its NRHP eligibility. PHMC-BHP reviewed preliminary Phase Ib results as presented in GAI's Phase Ib Management Summary (Munford and Tuk 2008) and concurred with these recommendations in their March 2, 2009 review letter (see Appendix A).

Phase II Methods

At the request of UniStar, GAI performed a Phase II National Register site evaluation of Site 36LU288. Phase II investigations were conducted in accordance with GAI's Phase II Scope of Work (May 29, 2009) as approved by the PHMC-BHP (June 11, 2009) (see Appendices A and B). The study included field excavations and laboratory analysis. Phase II investigations were designed to (1) interpret the cultural affiliation and function of the site, (2) identify horizontal and vertical site limits, (3) determine site integrity, (4) assess research potential, and (5) evaluate site significance as defined by eligibility for listing in the NRHP. Phase II fieldwork was conducted between October 9 and November 4, 2009.

Prior to the start of field investigations, the previously-cultivated field containing the site was plowed and disked and was rain washed in order to provide good ground surface visibility. GAI surveyors established a grid across the site using a total station. The survey grid covered an area measuring 160x265 meters (524.9x869.4 feet). Stakes were placed at 20-meter (65.6-foot) intervals along north/south and east/west baselines at the edges of the site and at 20-meter intervals throughout the site area. Ground surface elevation was recorded at each survey stake. Subsequent excavations were designated by their coordinates within this grid.

Phase II fieldwork included controlled surface collection (CSC) followed by judgmental shovel testing, test unit excavation, plowzone stripping (mechanical trenches), feature sampling, mapping, and photo-documentation. Due to the need for mechanical plowzone stripping, the Luzerne County Conservation District required preparation and implementation of an Erosion and Sedimentation Control (E&S) Plan for the site (see Appendix L). In accordance with this plan, GAI installed silt fencing along the northern and eastern edges of the cultivated field.

Phase II fieldwork began with a CSC of the entire 160x265-meter (524.9x869.4-foot) site area, within 5x5-meter (16.4x16.4-foot) surface collection blocks (Figure 19-4, Photographs 19- 5 and 19-6). GAI archaeologists examined the ground surface within each block and observed artifacts were collected, bagged, and provenienced according to the southwest corner grid coordinates of the collection block. A total of 1,600 surface collection blocks were examined during the CSC.

Photograph 19-5. Site 36LU288: View of Phase II Controlled Surface Collection, Facing Northeast

Photograph 19-6. Site 36LU288: View of Northern Portion of Site, Facing East

Based on the results of the surface collection, and previous Phase Ib investigations, 56 judgmental STPs were excavated in areas of relatively higher artifact density across the site (see Figure 19-4). STPs measured 50 cm (1.6 feet) in diameter and were hand-excavated by natural stratigraphy to a depth of approximately 80 cm (2.6 feet) below ground surface.

GAI excavated 20 1x1-meter (3.3x3.3-foot) test units (TUs 1-20) in select areas of the site to sample areas of higher artifact density, possible features or possible activity areas, and to refine site stratigraphy (Photographs 19-7 and 19-8). Test units were hand-excavated in 10-cm (0.3 foot) levels within natural strata, to a depth of approximately 80 cm (2.6 feet) below ground surface. Fourteen of the 20 units were excavated in the site's northwest quadrant, five were situated in the northeast quadrant, and one was placed in the southwest corner of the site (see Figure 19-4).

Photograph 19-7. Site 36LU288: View of Test Unit Excavation, Facing Southwest

Photograph 19-8. Site 36LU288: View of Test Unit Excavation, Facing Northwest

The 14 units located in the northwest quadrant of the site include TUs 1 -10, 13, 17, 18, and 20. TU 1 (N157 E50), TU 2 (N170 E32) and TU 17 (162 E45) were excavated in the southern portion of the site's northwest quadrant, in an area of positive surface collection blocks (see Figure 19-4). Both TUs 1 and 2 sampled surface collection blocks that yielded projectile points—a nondiagnostic point and a Holcombe-like Paleo point base, respectively. TU 3 (N212 E55), TU 7 (N216 E47), TU 13 (N215 E52), and TU 20 (N210 E47) were situated in the northwest quadrant in a cluster of six positive surface collection blocks and two positive shovel tests, just west of the low swale that bisects the site. TU 10 (N236 E50) was excavated to the north of this cluster, along the west edge of the swale, to investigate the area of two positive surface collection blocks and one positive shovel test. TU 4 (N222 E30) and TU 18 (N228 E30) were located in an area of four contiguous positive surface collection blocks and two positive STPs, while TU 5 (N232 E20) sampled an area with two positive surface collection blocks and one positive STP, near the northwest edge of the site. TU 6 (N247 E15), TU 8 (242 E22), and TU 9 (N247 E28) were excavated in the northwest corner of the site to sample seven contiguous positive surface collection blocks and one positive STP.

Of the five test units located in the site's northeast quadrant (TUs 11, 12, 14, 15 and 16), four units (TU 11,14, 15 and 16 – see Photograph 19-9) were excavated as a block centered on a

prehistoric feature (Feature 1). TU 11 (N225 E122) was initially placed in the north central portion of this quadrant to investigate the area of three positive surface collection blocks. Upon identification of Feature 1 in the corner of TU 11, TU 14 (N224 E122), TU 15 (N225 E123), and TU 16 (N224 E123) were excavated to its south and east to fully expose and sample the feature. TU 12 (N250 E102) was placed near the site's northern edge, approximately 25 meters (82 feet) to the north of the block excavation, in the area of two positive surface collection blocks and one positive shovel test.

Photograph 19-9. Site 36LU288: Overview from Northeast Corner of Site* showing *Test Unit Block Excavation (TUs 11, 14, 15 and 16), Facing South

TU 19 (N47 E22), the sole unit in the southern half of the site, was excavated in the southwest corner within a positive surface collection block that yielded one Late Woodland Levanna projectile point.

Following the completion of hand excavations, GAI conducted mechanical stripping of the plowzone to investigate the presence of cultural features at the top of the subsoil. Eleven trenches (Trenches 1-11) were excavated (Figure 19-4) using two rubber-tired backhoes with flat-bladed buckets (Photographs 19- 10 and 11). The 2-meter (6.6-foot) wide trenches were oriented north/south and varied in length from 60 to 105 meters (197 to 344 feet). Within each trench the backhoe removed the plowzone, in increments, to the top of the B horizon. Excavated soils were deposited in piles along one side of each trench. GAI archaeologists then hand shovel-scraped the floor of the trench to expose soil anomalies or artifact concentrations representing possible cultural features.

Photograph 19-10. Site 36LU288: Trench 2 (Northwest Portion of Site) showing Exposed Subsoil, Facing North

Identified features were documented and sampled. Trenches were mechanically backfilled upon completion of investigations. GAI excavated 2,170 m^2 (23,358 ft^2) during plowzone stripping, representing approximately 5.5 percent of the site. Due to the near dearth of artifacts in the southern portion of the site, plowzone stripping was reduced from the proposed 3,800 m^2 (40,904 ft^2), and was concentrated in the site's northern half.

Photograph 19-11. Site 36LU288: Trench 8 (Northeast Portion of Site) showing Exposed Subsoil, Facing South

Five parallel trenches (Trenches 1-5) were situated in the northwest quadrant of the site (Photograph 19-12), in the area of relatively higher elevation, west of the low swale. These trenches were excavated at 10-meter intervals (E10 to E50) and measured 105 meters (344 feet) in length, extending from the N150 gridline to the N255 gridline, at the northern edge of the site. Four trenches (Trenches 6-9) were placed in the northeast quadrant of the site, on the opposite side of the low swale. Like Trenches 1-5, these four trenches were also set at 10-meter intervals (E100 to E130), measured 105 meters (344 feet), and extended from N150 to N255. Two trenches (Trenches 10 and 11) were excavated to sample the southwest portion of the site. Trenches 10 and 11 were located at E20 and E30, respectively, and were both 60 meters (197 feet) in length (gridlines N45 to N105).

Photograph 19-12. Site 36LU288: Overview of Plowzone Stripping in Northwest Portion of Site, showing Trenches 1-4, Facing Northeast

Phase II Soils and Geomorphology

Site 36LU288 is located in a low terrace/floodplain setting adjacent to the west bank of the Susquehanna River. The Luzerne County Soil Survey (Bush 1981) maps the area of the site with Pope (Ps) soils, which is characterized by deep, well drained soils that formed in alluvial sediments derived from sandstones and shales. Minor components associated with the Pope soils series include Holly silt loam (Ho), a more poorly-drained soil found within low depressions on the floodplain.

Based on the results of Phase Ia geomorphological reconnaissance, David Cremeens (GAI's Senior Lead Soil Scientist) concluded that soils within the site area are Late Holocene to recent in age. As shown in Figure 19-5, the field containing the site has a generally level to slightly undulating topography. Extending across Site 36LU288 are two of a series of shallow, poorly-drained, northwest/southeast-oriented swales that traverse the floodplain, generally in-line with the modern riverbank and levee. An additional swale lies in the field immediately west of the site (Area 7, Section 2). These roughly parallel, linear features likely represent former stream channels of the Susquehanna River and may have subsequently served as flood chutes as the river channel migrated eastward. The swales are flanked by slightly higher-elevation portions of the landform, representing the remnants of natural levees within the floodplain (Photographs 19- 13 and 14).

Photograph 19-13. Site 36LU288: Eastern Portion of Field showing Shallow Northwest/Southeast-Oriented Swale, Facing Southeast

Photograph 19-14. Site 36LU288: Overview from Northwest Corner of Site showing Shallow Northwest/Southeast-Oriented Swale, Facing Southeast

The broad, undulating micro-topography evident within the surface of the floodplain at Site 36LU288 appears to represent a series of remnant levees and channels/flood chutes with varying degrees of potential for the presence and preservation of archaeological deposits. Natural levees are formed at the edge of an active meandering stream channel, usually on the outside of a meander bend, such as the floodplain at Bell Bend (see Figure 19-1). The levee deposit is thickest at the channel margin (forming the topographic rise of the levee) and becomes thinner away from the

channel (forming the swale behind the levee, which also may serve as a flood chute during flood events). Levee deposits owe their character to the reduction of flow velocity when streams overflow their banks, causing the largest suspended particles to be deposited adjacent to the bank (Ritter et al. 2002). Consequently, levee deposits are generally more coarse-grained and well-drained than the swale or back floodplain deposits, and are accreted more rapidly (although sporadically).

The drier and slightly higher landform of the levee creates an attractive and periodically stable land surface for prehistoric occupation/use within proximity of riparian resources. If the stability of the surface (a lack of significant erosion or deposition) is of sufficient length of time, the surface deposits are subjected to pedogenesis and the formation of an A horizon. Subsequent overbank deposition within the levee can be rapid and substantial, burying the A horizon and potentially preserving related archaeological remains. After this rapid deposition, during a subsequent period of stability, the surface of the new deposit undergoes A horizon formation. However, the thickness of the new deposit may separate and preserve the original buried A horizon. The repetition of this rapid but sporadic process through time creates the stacked sequences of weakly developed buried A and B horizons sometimes noted within the soil profiles of remnant levee deposits in the floodplain. As discussed below, a buried A horizon sequence was found within the soil profiles at two locations within the remnant levee deposits at Site 36LU288.

The lower lying and more poorly drained areas of the swales within the back floodplain exhibit less potential for prehistoric occupation/use and preservation of remains. Within the back floodplain, deposition of finer-grained sediments within the swales is characterized by relatively moderate rates of burial, by thinner accretion, and/or with more time between deposition episodes, resulting in the slow, incremental thickening of the A horizon (or stacked Ap horizons within cultivated lands). Such “cumulic” A horizons, or “cumulic soils" are common within the back floodplain and are in contrast to the stratified buried soils often found within the natural levees. However, portions of the “cumulic” or thickened A horizon may be potentially related to or temporally concurrent with the stable surfaces represented by the buried A horizons found within the adjacent levee deposits. The lack of accretion, overlay of soil formation through time, and potential erosion of deposits within the swale/flood chute environment complicate the recognition of this relationship. Thickened A horizons (or Ap horizons) were noted within the swale deposits during the Phase II investigations at Site 36LU288.

The entire area of Site 36LU288 (see Figure 19-5) has been plowed and test units and STPs, excavated to a depth of approximately 80 cm (2.6 feet) below surface, primarily exposed a simple plowzone-subsoil (Ap-Bw) soil horizon sequence across the majority of the site. The Ap horizon generally ranged from 31 to 45 cm (1.0 to 1.47-feet) in thickness. Typical stratigraphic profiles at the site, exemplified by the profiles of Phase Ib STPs A1 and E9 provided in Figure 19-3, consisted of approximately 38-cm (1.2-foot)-thick brown silt loam Ap horizon above a yellowish-brown silt loam Bw horizon that extended to a maximum excavated depth of 80 cm (2.6-feet) below surface. The profile of STP A15 (see Figure 19-3) shows the thickened Ap horizon found within swale deposits. Profiles exposed during the Phase II investigations generally verified the nature and extent of this stratigraphy across the site.

In one location, the block excavation of TUs 11, 14, 15, and 16 within the levee deposits (see Figure 19-5), an older or less frequently plowed layer (Ap2) was observed immediately below the surface plowzone (Ap1) (Figure 19-6). The Ap2 horizon measures only 1 to 4 cm in thickness and has diffuse boundaries. More importantly, a buried A (Ab) horizon was documented during the Phase II investigations within the soil profiles in six test units (TUs 10,

11, 12, 14, 15 and 16) and in four STPs (N210 E120, N215 E60, N250 E100 and N255 E105), all located near the northern end of the site (north of the N210 gridline) (see Figure 19-5).

As discussed above, this Ab horizon represents a former ground surface that was exposed and stable for sufficient time to undergo A horizon formation processes before being covered by overlying deposits. The Ab horizon at Site 36LU288 was encountered within the levee deposits, primarily in the northeast quadrant of the site (five test units and three STPS), as well as in two separate locations in the site's northwest quadrant (one test unit and one STP) (see Figure 19-5). Four of these five test units in the northeastern quadrant (TUs 11, 14, 15 and 16) represent a block of contiguous units excavated to expose and sample Feature 1. Photograph 19-15 shows the Ab horizon as exposed in the north wall profile of excavated TUs 11 and 15.

Photograph 19-15. Site 36LU288: TUs 11 and 15, North Wall Profile showing Buried A (Ab) Horizon, Facing North

The soil profile in those areas of Site 36LU288 containing a buried A horizon generally consisted of an Ap(Ap1/Ap2)-Bw-Ab-Bwb soil horizon sequence. The Ab horizon was encountered at a depth of between 51 and 66 cm below surface and was approximately 30 cm (0.98 feet) thick. As illustrated in the west wall profile for TUs 11 and 14 (see Figure 19-6) the upper portion of the soil profile included a 35-cm (1.15-foot) thick dark-grayish-brown silt loam Ap1 horizon (upper plowzone), an approximately 4-cm (0.13-foot) thick brown silt loam Ap2 horizon (older/lower plowzone), and a 26-cm (0.85-foot) thick yellowish-brown silt loam Bw horizon. The Bw horizon overlays a 30-cm (0.98-foot) thick dark yellowish-brown Ab horizon and a yellowish-brown Bwb horizon that extended to the base of the unit at an excavated depth of 1.15 meters (3.8 feet) below surface. A prehistoric hearth feature (Feature 1) (described below) was identified in the Ab horizon in TUs 11, 14, 15, and 16.

Overall, floodplains are dynamic and complex sedimentary environments, undergoing continual change by covering or eroding previous deposits during flood events and channel meanders (Goldberg and Macphail, 2006). Because of this, archaeological remains of disparate ages can be associated with seemingly incongruous vertical and horizontal positions within the floodplain deposits. For example, historic to recent sediments may cover younger artifacts with 1-2 meters of alluvium at one location while, a short distance away, older artifacts may be at or near the current ground surface (Guccione et al., 1998, Goldberg and Macphail, 2006). Conversely, cultural remains of comparable age may be found in apparently different pedo-stratigraphic contexts. This latter situation appears to have occurred at Site 36LU288. Two similarly dated cultural features were identified in seemingly different contexts (see Figure 19-5), one within the thickened A horizon toward the edge of a levee landform near a swale (Feature 2) and one within a buried A horizon on the slightly elevated crest of the same levee (Feature 1). Evidence

suggests that the prehistorically occupied land surface (stable A horizon) was differentially buried, with the crest of the levee receiving thicker flood deposits and the area near the swale (either having less deposition or having been subjected to periods of erosion) receiving less overall accretion of deposits.

Phase II Results

Phase II testing at Site 36LU288 consisted of controlled surface collection of 1,600 5x5-meter (16.4x16.4-foot) blocks, the excavation of 56 judgmental shovel test and 20 test units, mechanical plowzone stripping, and feature sampling. This work produced 284 prehistoric artifacts, 103 historic artifacts and documented two prehistoric cultural features (Features 1 and 2) (Table 19-3). The Phase II prehistoric artifact assemblage included 11 bifaces, 5 unifaces, 211 lithic debitage, and 57 fire-cracked rocks (Table 19-4). The sample of 103 Phase II historic artifacts consisted largely of bottle/jar glass, window glass, and ceramics.

Table 19-3. Site 36LU288: Phase II, Stratigraphic Distribution of Prehistoric Artifacts by Testing Method

Horizon	CSC*	STPs	TUs	Plowzone Stripping	Total	%
Surface	59			2	61	21.48%
Ap		7	92	11	110	38.73%
Bw		6	45		51	17.96%
Ab			12		12	4.22%
Feature Fill			29	21	50	17.61%
TOTAL	**59**	**13**	**178**	**34**	**284**	**100.00%**

*Controlled Surface Collection

Table 19-4. Site 36LU288: Phase II, Stratigraphic Distribution of Prehistoric Artifacts by Artifact Class

Soil Hz	Biface	Debitage	FCR	Uniface	Total	%
Surface	7	49	1	4	61	21.48%
Ap	3	105	1	1	110	38.73%
Ab	1	3	8		12	4.23%
Bw		47	4		51	17.96%
Feat 1		4	25		29	10.21%
Feat 2		3	18		21	7.39%
TOTAL	**11**	**211**	**57**	**5**	**284**	**100.00%**

Controlled Surface Collection

Controlled surface collection (CSC) of 1,600 5x5-meter (156.4x16.4-foot) blocks across the site area produced just 59 prehistoric lithic artifacts from 55 positive blocks and 54 historic/modern specimens from 48 blocks (see Table 19-3; see Figure 19-5). One diagnostic prehistoric artifact, a Late Woodland Levanna projectile point, was recovered from Block N45 E20, in the southwest corner of the site. Prehistoric artifact density was exceedingly low, with 50 of the 54 positive blocks yielding single artifacts; the four remaining blocks each produced just two lithics. Over three quarters (76 percent, *n*=45) of the prehistoric artifacts recovered during controlled surface collection were found in the northern half of the site (north of the N150 gridline), including 34

artifacts from a low density concentration in the northwest quadrant and 11 from the northeast quadrant. Only 14 prehistoric artifacts were recovered from the southern half of the site during the surface collection.

The 54 historic artifacts recovered during surface collection were widely dispersed across the entire site area. However, contiguous positive surface collection occurred in a band near the center of the field (approximately N150 to N165 gridlines).

Judgmental Shovel Testing

The excavation of 56 judgmental shovel tests produced 13 prehistoric lithics from eight positive STPs (including one which also yielded historic artifacts) as well as 13 historic artifacts from an additional eight shovel tests (see Table 19-3; Figure 19-5).

Prehistoric artifact density ranged from one to three lithics per shovel test. These artifacts all consisted of debitage; no diagnostic artifacts were recovered from Phase II shovel tests.

Judgmental shovel testing documented a low-density scatter of prehistoric artifacts in the northwest corner of the site (see Figure 19-5). The eight prehistoric positive STPs were all located in the northern end of the site (north of the N200 gridline), with seven clustered in the northwest corner and one isolated positive STP in the northeast portion. Stratigraphically, the meager sample of prehistoric artifacts was recovered in nearly equal numbers from the Ap and Bw horizons (see Table 19-3).

The sample of 13 historic artifacts recovered from positive STPs was situated primarily in the site's northwest quadrant (north of the N150 gridline). Three widely scattered historic positive STPs occurred in the southern half of the site, including one near the center, one at the west edge and one along the south edge of the site. All but one of these 13 historic artifacts were found in plowzone contexts.

Test Unit Excavations

The excavation of 20 test units (Table 19-5) produced 178 prehistoric lithics and exposed one prehistoric cultural feature (Feature 1, described below) (see Table 19-5); 28 historic specimens were also recovered. The test unit lithic assemblage (inclusive of the feature recoveries) includes 4 bifaces, 1 uniface, 135 debitage and 38 fire-cracked rocks. The sample of bifaces consists of one diagnostic projectile point—a Holcombe-like Paleo point base (FS 159) recovered from the plowzone in TU 2, in the northwest portion of the site.

Table 19-5. Site 36LU288: Phase II Test Unit Summary

TU	Location	Soil Stratigraphy (Depth=cm below ground surface)	Prehistoric Artifact Total	Historic Artifact Total	Comments
1	N 157 E 50	Ap=0-34 cm, Bw=34-84 cm	7	2	No features present.
2	N 170 E 32	Ap=0-38 cm, Bw=38-80 cm	4	1	No features present.
3	N 212 E 55	Ap=0-44 cm, Bw=44-80 cm	12	0	No features present.
4	N 222 E 30	Ap=0-34 cm, Bw1=34-44 cm, Bw2=44-84 cm	7	1	Plowscars at Ap-Bw interface. No features present.
5	N 232 E 20	Ap=0-30 cm, Bw=30-80 cm	7	1	No features present.
6	N 247 E 15	Ap=0-30 cm, Bw=30-80 cm	5	1	No features present.
7	N 216 E 47	Ap=0-29 cm, Bw=29-80 cm	10	0	No features present.

TU	Location	Soil Stratigraphy (Depth=cm below ground surface)	Prehistoric Artifact Total	Historic Artifact Total	Comments
8	N 242 E 22	Ap=0-30 cm, Bw=30-80	4	0	No features present.
9	N 247 E 28	Ap=0-26 cm, Bw=26-80 cm	5	1	No features present.
10	N 236 E 50	Ap=0-40 cm, Bw=40-50 cm, Ab=50-80 cm	3	2	No features present. Ab horizon.
11	N 225 E 122	Ap=0-35 cm, Ap2=35-38 cm, Bw=38-56 cm, Ab=56-84 cm, Bwb=84-104 cm	5	0	Plowscars at Ap-Bw interface. Feature 1 (hearth) in Ab.
12	N 250 E 102	Ap=0-37 cm, Bw=37-53 cm, Ab=53-85 cm	2	0	Plowscars at Ap-Bw interface. No features present. Ab horizon.
13	N 215 E 52	Ap=0-44 cm, Bw=44-80 cm	14	1	No features present.
14	N 224 E 122	Ap=0-35 cm, Ap2=35-39 cm, Bw=39-65 cm, Ab=65-95 cm, Bwb=95-115 cm	16	1	Plowscars at Ap-Bw interface. Feature 1 (hearth) in Ab.
15	N 225 E 123	Ap=0-33 cm, Ap2=33-35 cm, Bw=33-63 cm, Ab=63-86 cm, Bwb=86-111 cm	9	5	Plowscars at Ap-Bw interface. Feature 1 (hearth) in Ab.
16	N 224 E 123	Ap=0-31 cm, Ap2=31-35 cm, Bw=31-57 cm, Ab=57-93 cm, Bwb=93-113 cm	23	5	Plowscars at Ap-Bw interface. Feature 1 (hearth) in Ab.
17	N 162 E 45	Ap=0-28 cm, B=28-80 cm	2	1	No features present.
18	N 228 E 30	Ap=0-30 cm, Bw=30-80 cm	7	0	No features present.
19	N 47 E 22	Ap=0-30 cm, Bw=30-80 cm	3	5	No features present.
20	N 210 E 47	Ap=0-35 cm, Bw=35-82 cm	4	1	No features present.
11/14/ 15/16	N224-225 E122-123		29	0	Feature 1 (hearth) at center of block of four units
		TOTAL	178	28	

As described above (Phase II Soils and Geomorphology), test units generally exposed an Ap-Bw soil horizon sequence within the site. Representative profiles of this sequence occurring across the extent of the site are provided for TUs 2, 8, 13, and 19 within Figures 19-7, 19-8, 19-9, and 19-10, respectively. However, as shown in Figure 19-5, a buried A (Ab) horizon was encountered in six test units (Table 19-5), including five units in the northeast portion of the site (TUs 11, 12, 14, 15, and 16) and one in the northwest portion (TU 10). As previously discussed above and as shown by the profile in Figures 19- 6 and 19-11, the deposits found within the block excavation of TUs 11, 14, 15, and 16 documented a 30 cm (0.98 feet) thick Ab horizon at a depth of between 51 and 66 cm below surface within the levee deposits in the northeastern corner of the site. The excavation of TU 12, located approximately 30 m (49.2 ft) northwest of the block excavation within the same levee landform (see Figure 19-5), also encountered an Ab horizon at a depth of 53 cm below ground surface (Figure 19-12). Within the northwest portion of the site, in a second remnant levee deposit, the excavation of TU 10 exposed a south wall profile (see Figure 19-13) with an Ab horizon at a depth of 50 to 55 cm below surface.

Stratigraphically, approximately one half (52 percent, *n*=92) of the Phase II test unit lithic assemblage was found in the plowzone (Ap horizon). The remaining artifacts were recovered largely from the Bw horizon (25 percent, *n*=45), and in lower frequencies from the Ab horizon (7 percent, *n*=12) and feature fill (16 percent, *n*=29) (Table 19-6).

Table 19-6. Site 36LU288: Phase II Test Units, Stratigraphic Distribution of Prehistoric Artifacts by Artifact Class

Soil Hz	Biface	Debitage	Fire Cracked Rock	Uniface	Total	%
Ap	3	87	1	1	92	51.69%
Bw		41	4		45	25.28%
Ab	1	3	8		12	6.74%
Feature Fill		4	25		29	16.29%
TOTAL	**4**	**35**	**38**	**1**	**178**	**100.00%**

Prehistoric artifact density was very low, ranging from 2 to 23 lithics per test unit. Of the 20 units excavated, 16 units produced ten or fewer lithics (Table 19-7). Only one unit (TU 16) yielded more than 20 artifacts. Note that the 29 artifacts recovered from Feature 1, situated at the intersection of TUs 11, 14, 15, and 16, could not be separated by test unit and are listed separately. This block of four contiguous units (TUs 11, 14, 15, and 16), excavated in the northeast portion of the site to expose Feature 1, yielded nearly half (*n*=82, 46 percent) of the test unit assemblage.

Table 19-7. Site 36LU288: Phase II Test Units, Stratigraphic Distribution of Prehistoric Artifacts

TU	Ap	Bw	Ab	Feature Fill	Total	%
1	3	4			7	3.93%
2	4				4	2.25%
3	6	6			12	6.74%
4	7				7	3.93%
5	7				7	3.93%
6	5				5	2.81%
7	10				10	5.62%
8	4				4	2.25%
9	5				5	2.81%
10			3		3	1.69%
11	5				5	2.81%
12	1	1			2	1.12%
13	11	3			14	7.87%
14	3	10	3		16	8.99%
15	3	5	1		9	5.06%
16	2	16	5		23	12.92%
17	2				2	1.12%
18	7				7	3.93%
19	3				3	1.69%
20	4				4	2.25%
11 / 14 / 15 / 16				29*	29	16.29%
TOTAL	**92**	**45**	**12**	**29***	**178**	**100.00%**

* Total artifacts from Feature 1, which spans portions of TUs 11, 14, 15 and 16.

Test unit excavations identified one prehistoric cultural feature (Feature 1, described below), a prehistoric hearth initially encountered in the southeast corner of TU 11 at a depth of

approximately 66 cm (2.2 feet) below ground surface, within the buried A horizon. TUs 14, 15 and 16 were excavated to the south and east of TU 11 to fully expose the feature. Following completion of Feature 1 excavation, these four units were excavated an additional four 10-cm levels to sample the Ab horizon (see Figures 19-6 and 19-11; see Photograph 19-15). Excavation was terminated in the Bwb horizon at a depth of approximately 115 cm below surface. As shown in Table 19-7, nine prehistoric artifacts were recovered from the Ab horizon in these units, while no artifacts were found in the underlying Bwb horizon.

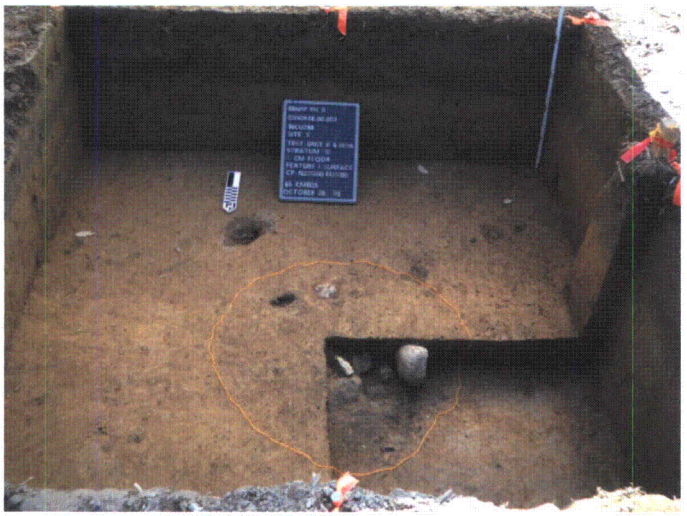
Plowzone Stripping

Plowzone stripping within eleven trenches (Trenches 1-11, comprising a total surface area of 2,170 m^2 /23,358 ft^2) resulted in the identification of one prehistoric cultural feature (Feature 2) (see Figure 19-5) as well as the recovery of 13 prehistoric lithic artifacts and eight historic artifacts. The 13 recovered lithics represent a nonsystematic collection of artifacts observed during this task; they include two lithics found on the surface and 11 found within the plowzone (see Table 19-3). Feature 2 (described below) was a prehistoric hearth feature (center point = N185.62 E100.36) identified in Trench 6, located in the northeast portion of the site. It was exposed at the Ap/Bw horizon contact, at a depth of 40 cm (1.3 feet) below ground surface, during hand-shovel scraping of this trench.

Features

Phase II testing of Site 36LU288 documented two prehistoric cultural features (Features 1 and 2), both representing hearth features.

Feature 1 is a prehistoric hearth feature located in the northeast portion of the site at N225.00 E123.00 (see Figure 19-5). The feature was initially identified in TU 11, where it was observed as an area of dark staining with charcoal flecking and fire-cracked rock in the southeast corner of the unit, at a depth of approximately 80 cm (2.6 feet) below ground surface and 20 cm (0.6 feet) below the top of the buried A (Ab) horizon. Based on detailed examination of the soil profile in the south and east walls of TU 11, it was determined that the uppermost surface of the feature occurred at a depth of approximately 66 cm (2.2 feet) below ground surface (elevation of approximately 505.467 feet amsl), just 2-3 cm below the Bw/Ab horizon contact. The upper portion of the feature was not clearly visible in planview and was removed during excavation of Levels 8 and 9 of this unit (no artifacts were recovered from these levels). Three additional test units (TUs 14, 15 and 16) were subsequently opened and hand-excavated to the upper surface of the feature (approximately 66 cm/2.2 feet below ground surface) to fully expose the feature (Photograph 19-16). The stratigraphic position of Feature 2 within TUs 14 and 15 are shown in Figures 19- 4 and 19-15, respectively.



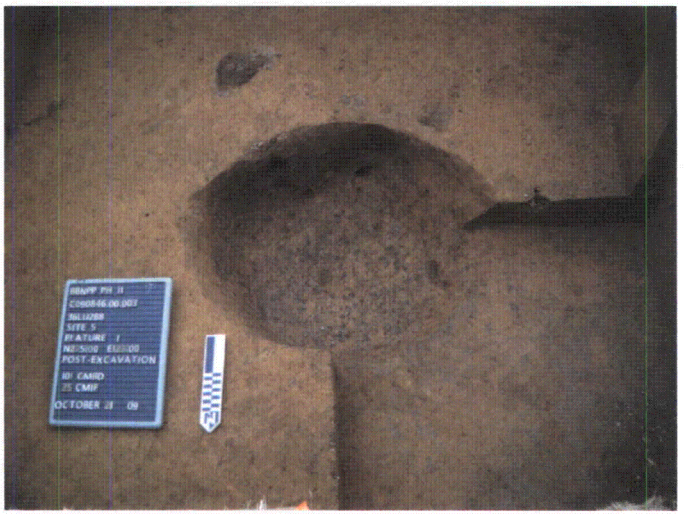
Photograph 19-16. Site 36LU288: Feature 1* Planview *as Exposed in the Southeast Corner of TU 11 (Approximately 80 cm Below Ground Surface) and in TUs 14, 15 and 16 (Approximately 66 cm Below Ground Surface), with String Marking Outline of Feature, Facing South

Feature 1 is roughly circular in planview (Figure 19-16) and has dimensions of 75x80 cm (2.5x2.6 feet). It has a basin-shaped profile (Figure 19-17) with a maximum depth of 28 cm (0.9 feet). No evidence of stratification was observed in the profile. The feature fill consists of dark-grayish-brown (10YR 3/2) silt loam with charcoal flecking and fire cracked rock.

The feature was mapped and photographed in planview (see Figure 19-16, see Photograph 19-16). It was then bisected along an east/west axis (Photographs 19-17 and 19-18) and the north half of the feature was removed in three 10-cm arbitrary levels and screened. Following recordation of the feature profile the south half of the feature was fully excavated in three 10-cm levels (Photograph 19-19). Flotation samples (approximately 7 to 8.5 liters each) were collected from each level and the remaining soil was screened through ¼ inch mesh. Charcoal samples for radiocarbon dating were also hand-collected during excavation.

Photograph 19-17. Site 36LU288: Feature 1,* Planview *of Partially Excavated Northern Half showing Fire-Cracked Rocks, Facing South

Photograph 19-18. Site 36LU288: Feature 1, South Profile, Facing South



Photograph 19-19. Site 36LU288: Feature 1,* Planview *of Excavated Feature, Facing South

Hand-excavation of Feature 1 yielded 25 pieces of fire-cracked rock; no chipped stone artifacts were found during feature excavation. However, four micro flakes were recovered during subsequent processing of flotation samples (see Table 19-8).

Table 19-8. Site 36LU288: Feature 1, Crosstabulation of Artifact Class by Lithic Raw Material

Material Type	Debitage	Fire Cracked Rock	Total	%
Quartz		8	8	27.59%
Quartzite		3	3	10.34%
Sandstone		14	14	48.28%
Shriver/Helderberg	4*		4	13.79%
TOTAL	4*	25	29	100.00%

*micro flakes recovered during flotation processing

Flotation samples were processed at GAI and the carbonized specimens recovered from the heavy and light fractions (7.63 grams [0.27 oz]), as well as the hand-collected charcoal samples, were submitted to Justine McKnight for archaeobotanical analysis (see Appendix K). Archaeobotanical analysis of these samples identified wood charcoal including oak, ring porous taxa, and deciduous taxa. No carbonized plant food remains were identified.

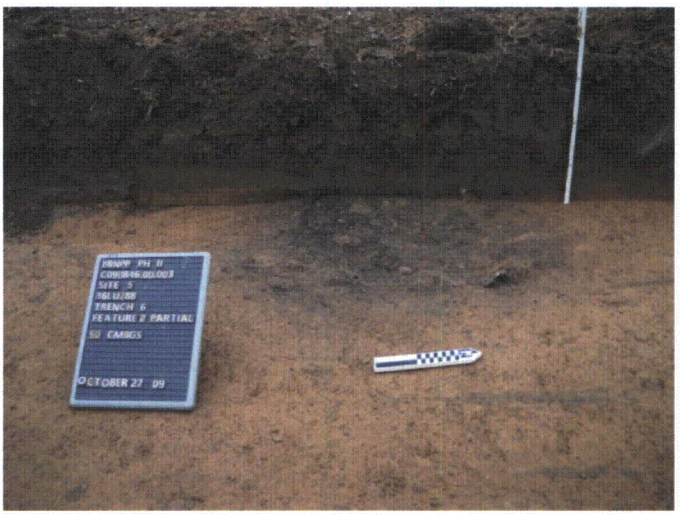
Following completion of archaeobotanical analysis, hand collected charcoal samples from Feature 1, Level 2 were submitted to BetaAnalytic for a radiocarbon assay (see Appendix M). AMS counting analysis provided a radiocarbon age for Feature 1 of ca. 3710 +/- 40 BP (Beta 275531), with calibration intercept dates of BC 2130, BC 2080 and BC 2060, and with a 2 sigma range of BC 2200 to 2010 and BC 2000 to 1980. This indicates occupation/use of the site and formation of Feature 1 during the Late Archaic period.

Feature 1 was interpreted as a basin-shaped hearth that was excavated by the site's prehistoric inhabitants for heat, and possibly for cooking, during a short-term Late Archaic period occupation of this locality. Given the lack of subsistence remains within the feature, however, extensive food processing activities are not indicated.

Feature 2 is a prehistoric hearth feature exposed during mechanical stripping of the plowzone within Trench 6, in the northeast quadrant of the site. It has a center point of N185.62 E100.36 and lies approximately 45 meters (147.6 feet) south of Feature 1 (see Figure 19-5). Feature 2 was identified at the top of the Bw horizon, approximately 40 cm (1.3 feet) below ground surface (elevation of 505.064 feet amsl). The upper portion of the feature has been truncated by plowing (Photograph 19-20) and a plow scar was observed extending north/south through the feature fill.

Photograph 19-20. Site 36LU288: Feature 2, Planview in Base of Trench 6, Facing West

The remaining portion of the feature has a shallow basin shape (Photograph 19-21). The western edge of Feature 2 extends into the wall of Trench 6 (Photograph 19-22); the feature was not fully exposed during excavations.



Photograph 19-21. Site 36LU288: Feature 2, West Profile, Facing West

Photograph 19-22. Site 36LU288: Feature 2, Planview of Excavated Feature in Base of Trench and Profile of Western Edge of Feature in West Wall of Trench 6, Facing West

Feature 2 is roughly circular in planview, with dimensions of its exposed portion measuring 90x100 cm (Figure 19-18). It has a basin-shaped profile with a maximum depth of 12 cm (Figure 19-19) and it extends slightly into the wall of Trench 6 (Figure 19-20). The central portion of the feature fill consists of very dark-brown (10YR 2/2) silt loam with charcoal flecking. A mottled zone of dark-brown and dark yellowish-brown (10YR3/3 and 10YR 3/4) silt loam lines the darker feature fill.

Feature 2 was cross-sectioned along its north/south axis and the east half was removed in two 10-cm arbitrary levels (Photograph 19-21). Flotation samples (approximately 7 to 8.5 liters each) were collected from each level and the remaining soil was screened through ¼ inch mesh. Eighteen fire-cracked rocks were collected from the feature fill (Table 19-9); no chipped stone artifacts were recovered from the feature fill or from the immediate surrounding area during plowzone stripping. However, three micro flakes were found during laboratory processing of flotation samples collected from the feature fill.

Charcoal identified in combined flotation samples collected from Feature 2, Level 1 was submitted to Justine McKnight Archeobotanical Consultant for archeobotanical analysis (see Appendix K). Based on the results of this analysis, wood charcoal—white oak and deciduous taxa—as well as non-carbonized (modern) seeds were identified within the feature fill. No carbonized plant food remains were identified within Feature 2.

Following completion of archaeobotanical analysis, charcoal from Feature 2, Level 1 flotation samples were submitted to BetaAnalytic for a radiocarbon assay (see Appendix M**).** AMS counting analysis yielded a radiocarbon age for Feature 2 of ca. 3420 +/- 40 BP (Beta 275532), with a calibration intercept date of BC 1740, and with a 2 sigma range of BC 1870 to 1840, BC 1820 to 1790, and BC 1780 to 1620. This indicates occupation/use of the site and formation of Feature 2 during the Late Archaic period.

Like Feature 1 (described above), Feature 2 was interpreted as a basin-shaped hearth that was excavated by the prehistoric inhabitants for heat and potentially cooking activities within a probable short-term habitation setting during the Late Archaic period. Based on the lack of subsistence remains within the feature, food processing was not a primary function of the feature.

Table 19-9. Site 36LU288: Feature 2 Crosstabulation of Artifact Class by Lithic Raw Material

Material Type	Debitage	Fire Cracked Rock	Total	%
Quartz		1	1	4.76%
Quartzite		5	5	23.81%
Sandstone		12	12	57.14%
Shriver/Helderberg	3*		3	14.29%
TOTAL	3*	18	21	100.00%

*micro flakes recovered during flotation processing

Phase I/II Artifact Analysis

Phase I and II excavations of Site 36LU288 yielded 332 prehistoric lithic artifacts and 137. The prehistoric assemblage includes 21 bifaces, 6 unifaces, 1 core, 247 pieces of debitage and 57 fire-cracked rocks (Table 19-10). Two-thirds (66 percent) of the prehistoric lithics were found in plow-disturbed contexts (surface or Ap horizon) (Table 19-11). The remaining lithics were recovered from the Bw horizon (15 percent) and, in lower frequencies, from the buried A (Ab) horizon, or feature fill. Importantly, 27 of the 28 tools, including all temporally diagnostic artifacts, were recovered from the plow-disturbed surface or Ap horizon.

The 137 historic specimens consist largely of bottle/jar glass and window glass, as well as low frequencies of other items, and represent non-site field scatter; these historic artifacts will be described at the end of this section.

Table 19-10. Site 36LU288: Phase Ib and II, Summary of Count, Weight and Mean Weight by Artifact Class

Artifact Class	Count	Total Weight (g)	Mean Weight (g)
Biface	21	148.56	7.07
Uniface	6	16.39	2.73
Core	1	71.69	71.69
Debitage	247	407.42	1.65
Fire Cracked Rock	57	23788.06	417.33
TOTAL	**332**	**24432.12**	**73.59**

Table 19-11. Site 36LU288: Phase Ib and II, Crosstabulation of Prehistoric Artifact Class by Soil Horizon

Soil Horizon	Biface	Core	Debitage	Fire Cracked Rock	Uniface	Total	%
Surface	15	1	68	1	5	90	27.11%
Ap	5		122	1	1	129	38.86%
Bw			47	4		51	15.36%
Ab	1		3	8		12	3.61%
Feat 1			4	25		29	8.73%
Feat 2			3	18		21	6.33%
TOTAL	**21**	**1**	**247**	**57**	**6**	**332**	**100.00%**

The buried A (Ab) horizon was identified in 10 test excavations (six test units—TUs 10, 11, 12, 14, 15, and 16— and four STPs) in the northern portion of the site. This horizon produced just 41 artifacts, including 12 from excavation of levels within the Ab horizon and 29 from Feature 1 (see Table 19-11). Over three-quarters of these artifacts consisted of FCR (*n*=33, 80 percent), including 22 sandstone, 8 quartz and 3 quartzite (Table 19-12). The remaining artifacts included one nondiagnostic biface manufactured from indeterminate chert and seven pieces of Shriver/Helderberg chert debitage. Outside of the block excavation (TUs 11, 14, 15, and 16) associated with Feature 1, only three artifacts were recovered from the Ab horizon, all in TU 10. The Ab horizon in TU 12 and the four STPs was culturally sterile. Based on this data, the artifacts in the Ab horizon represent an extremely low-density artifact scatter, focused on the location of Feature 1. Accordingly, the Ab horizon on Site 36LU288 does not appear to represent a long-term or heavily utilized prehistoric living surface.

Table 19-12. Site 36LU288: Buried A Horizon, Crosstabulation of Artifact Class by Testing Location

Testing Location	Biface	Debitage	Fire Cracked Rock	Total	%
TU 10	1	2		3	7.32%
TU 14			3	3	7.32%
TU 15			1	1	2.43%
TU 16		1	4	5	12.19%
Feature 1		4	25	29	70.73%
TOTAL	1	7	33	41	100.00%

Lithic Raw Material Types

Lithic analysis identified 20 raw material types within the assemblage (Table 19-13). These include 13 varieties of chert, along with low frequencies of sandstone, rhyolite, quartz, quartzite, jasper, and chalcedony. Locally-available Shriver/Helderberg Chert is the most common raw material, accounting for nearly 42 percent of the assemblage (*n*=139). Sandstone, used almost exclusively as fire-cracked rock, represents 12 percent of the artifacts (*n*=41), while Onondaga-like chert, black chert, gray chert, and rhyolite each comprise between approximately 5 to 9 percent (*n*=16 to 31). The remaining raw material types account for one to 11 artifacts each.

Table 19-13. Site 36LU288: Phase Ib and II, Crosstabulation of Artifact Class by Lithic Raw Material Type

Raw Material	Biface	Core	Debitage	Fire Cracked Rock	Uniface	Total	%
Bald Eagle Jasper (red)			1			1	0.30%
Black Chert	4	1	22			27	8.13%
Blue-gray Chert			3			3	0.90%
Chalcedony			1			1	0.30%
Dark gray Chert	1		3		1	5	1.51%
Dark Greenish Gray Chert					1	1	0.30%
Gray Chert			18			18	5.42%
Gray grainy Chert	1		5			6	1.81%
Gray translucent Chert			9			9	2.71%
Indeterminate Chert	1		4			5	1.51%
Jasper			3			3	0.90%
Light gray opaque Chert	1					1	0.30%
Onondaga-like Chert	1		29		1	31	9.34%
Oolitic Chert			4			4	1.20%
Quartz			2	9		11	3.31%
Quartzite				8		8	2.41%
Rhyolite	4		12			16	4.82%
Sandstone			1	40		41	12.35%
Shriver/Helderberg Chert	8		128		3	139	41.87%
Tan Chert			2			2	0.60%
TOTAL	21	1	247	57	6	332	100.00%

Four of the raw material types identified in the assemblage (Shriver/Helderberg chert, Onondaga chert, Bald Eagle jasper, and rhyolite) can be associated with known geological sources (see Figure 2-3). Shriver-Helderberg chert is available from local outcrops of the Helderberg formation, which extends from West Virginia and Virginia through Pennsylvania. Onondaga

chert occurs in primary sources in New York as well as in secondary cobble deposits in stream beds within the immediate project vicinity and in the surrounding region. Bald Eagle jasper can be obtained from outcrops associated with the Nittany formation in central Pennsylvania, approximately 130 kilometers (80 miles) to the west, while rhyolite outcrops approximately 150 kilometers (90 miles) to the southwest, along the Maryland-Pennsylvania border near South Mountain.

Remnant cortex was recorded on 18.5 percent (*n*=51) of the flaked stone assemblage (Table 19-14). Of this total, 8.7 percent (*n*=24) is cobble type, either from nodules or loose pieces within alluvial contexts, 6.2 percent (*n*=17) is block type, probably from a bedrock outcrop or naturally eroded block, and 3.6 percent (*n*=10) is indeterminate as to type of cortex.

An examination of cortex type for individual raw materials can provide information on toolstone sources. For Shriver/Helderberg chert, the most common raw material in the assemblage, cortex was observed on 10.8 percent (*n*=15) of the 139 artifacts. These cortical specimens included ten with block cortex and five with indeterminate cortex, supporting acquisition of Shriver/Helderberg chert from primary bedrock outcrops. In contrast, the small sample of Onondaga chert artifacts (*n*=31 total) contained 35.5 percent (*n*=11) with cortex—all cobble cortex, indicating a secondary cobble source for this raw material. Thirty-seven percent (*n*=8) of the black chert artifacts retained cortex, consisting largely of block cortex (*n*=6) along with two specimens each with cobble cortex and indeterminate cortex. This distribution suggests that black chert may have been obtained from both primary and, to a lesser degree, secondary sources.

Table 19-14. Site 36LU288: Phase Ib and II Crosstabulation of Cortex Type by Lithic Raw Material

Raw Material	Absent	Block Cortex	Cobble Cortex	Indeterminate Cortex	Total	%
Bald Eagle Jasper (red)	1				1	0.36%
Black chert	17	6	2	2	27	9.82%
Blue-gray Chert	2		1		3	1.09%
Chalcedony	1				1	0.36%
Dark gray chert	5				5	1.82%
Dark Greenish Gray Chert			1		1	0.36%
Gray Chert	12	1	5		18	6.55%
Gray grainy	4		1	1	6	2.18%
Gray translucent	9				9	3.27%
Indeterminate Chert	4			1	5	1.82%
Jasper	3				3	1.09%
Light gray opaque	1				1	0.36%
Onondaga-like	20		11		31	11.27%
Oolitic	3			1	4	1.45%
Quartz	2				2	0.73%
Rhyolite	15		1		16	5.82%
Sandstone			1		1	0.36%
Shriver/Helderberg	124	10		5	139	50.55%
Tan Chert	1		1		2	0.73%
TOTAL	224	17	24	10	275	100.00%

Analysis of lithic raw material types indicates that the prehistoric occupants of Site 36LU288 relied heavily on locally-available outcrops of Shriver/Helderberg chert as a lithic toolstone source. Onondaga chert was collected in substantially lower quantities from secondary cobble deposits, also available locally. The presence of low frequencies of non-local Bald Eagle jasper

and rhyolite in the assemblage may indicate either travel to these source areas or trade with other groups from these regions.

Bifaces

The sample of 21 bifaces recovered from the site includes nine projectile points, four late-stage bifaces, three middle-stage bifaces, one early-stage biface, and four indeterminate specimens (Table 19-15). Shriver-Helderberg chert was used to manufacture eight (38 percent) of these bifaces, while black chert and rhyolite were each used for four bifaces (19 percent each). The remaining five bifaces were made from five different chert varieties (Onondaga-like chert, dark-gray chert, gray grainy chert, light gray opaque chert and indeterminate chert) (see Table 19-14). The single early-stage specimen, manufactured from black chert, retains block cortex; cortex is absent from the other bifaces. All but one of the bifaces was recovered from the surface or plowzone; a single indeterminate biface fragment was found in the Ab horizon of TU 10. As illustrated in Figure 19-21, the 21 bifaces are widely scattered across the entire site, with a slight increase in the northwest quadrant (*n*=8 total bifaces) coincident with the overall distribution of artifacts within the site.

Table 19-15. Site 36LU288: Crosstabulation of Biface Type by Lithic Raw Material

Raw Material	Projectile Points	Early-Stage Bifaces	Middle-Stage Bifaces	Late-Stage Bifaces	Indeterminate Biface Fragments	Total	%
Black chert	1	1	1		1	4	19.05%
Dark gray chert				1		1	4.76%
Gray grainy	1					1	4.76%
Indeterminate Chert				1		1	4.76%
Light gray opaque	1					1	4.76%
Onondaga-like					1	1	4.76%
Rhyolite	1		1	2		4	19.05%
Shriver/Helderberg	5		1		2	8	38.10%
TOTAL	9	1	3	4	4	21	100.00%

The nine projectile points in the assemblage include five temporally diagnostic specimens—two Paleoindian points (one untyped fluted specimen and one Holcombe-like point), one Late Archaic Brewerton point, one Terminal Archaic/Early Woodland Frost Island or Orient Fishtail specimen, and one Late Woodland Levanna point, as well as four untyped specimens (one tip, one base, one broken untyped and one complete untyped stemmed point) (Table 19-16; Photograph 19-23). All projectile points were recovered from the surface or plowzone.

As shown in Figure 19-21, the nine recovered projectile points are scattered widely across the site. As with the distribution of total bifaces, the site's northwest quadrant produced a relatively higher density of points (*n*=4) than the other quadrants. However, the distribution of the five temporally diagnostic points is broadly dispersed and indicates no horizontal patterning. The Paleoindian Holcombe-like point and the Terminal Archaic/Early Woodland Frost Island or Orient Fishtail point were both recovered from the northwest quadrant of the site; the untyped Paleoindian point was found in the northeast quadrant; the Late Woodland Levanna specimen was recovered from the southwest quadrant and the Late Archaic Brewerton point was found in the extreme southeast corner of the site.

Photograph 19-23. Site 36LU288: Sample of Projectile Points

Top—Untyped Paleo Base (FS 12), Holcombe-like Paleo Base (FS 159), Late Archaic Brewerton Corner Notched (FS 32); Bottom—Terminal Archaic/Early Woodland Frost Island or Orient Fishtail (FS 11), Late Woodland Levanna (FS 47), Untyped Stemmed (FS 195) and Untyped (FS 76)

The two Paleoindian points both represent broken basal and mid-section portions of fluted specimens (see Photograph 19-23). The Holcombe-like point (FS 159) is made from Shriver/Helderberg chert and exhibits a diagonally break across the blade. Its base is deeply notched and it is fluted on both faces, with the flute on one face being very short. The untyped fluted point (FS 12), manufactured from light gray opaque chert, has a shallow basal notch and is fluted on both faces. This point is broken across the blade and the steeply angled break exhibits heavy unifacial retouch, indicating that the specimen was reworked to serve as a cutting or scraping tool when it was no longer viable as a projectile point. The presence of potlids indicates that this point was subject to thermal alteration.

The Late Archaic Brewerton corner notched point (FS 32) is a heavily reworked complete specimen made from black chert (see Photograph 19-23). Bifacial retouch on the distal edge and margins of the blade has resulted in a rounded shape for this nearly-exhausted specimen. The Terminal Archaic/Early Woodland Frost Island or Orient Fishtail point (FS 11) is a complete specimen made from gray grainy chert. The Late Woodland Levanna point (FS 47), manufactured from Shriver/Helderberg chert, represents a nearly complete specimen; a small portion of one margin and an ear are missing.

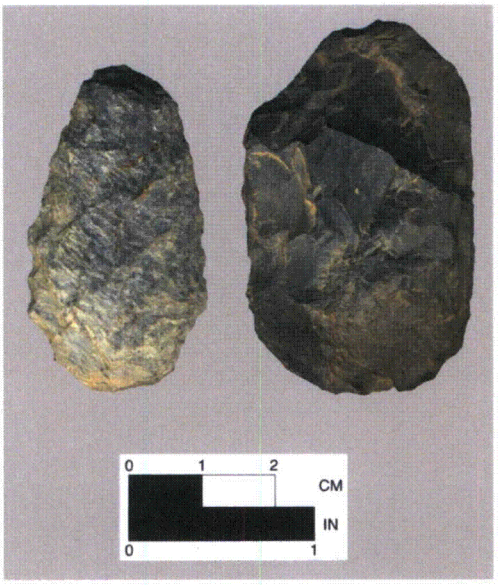
Table 19-16. Site 36LU288: Summary of Lithic Tools

FS#	N	E	STP	TU	Horizon	Wt (g)	Material	Artifact Type	Cortex	Condition	L (mm)	W (mm)	Th (mm)	Point Type	Temporal Period*
12	456.65	428.08			Surface	2.43	Light gray opaque	Projectile Point	Absent	Base		28.1	5.2	untyped fluted	Paleo
159	170	32		2	Ap	2.69	Shriver/Helderberg	Projectile Point	Absent	base			5.9	Holcombe-like	Paleo
32	315	405	A15		Ap	2.74	Black chert	Projectile Point	Absent	whole	21.9	21.8	4.2	Brewerton CN	LA
11	510.8	342.1			Surface	7.44	Gray grainy	Projectile Point	Absent	whole	44.7	22.9	6.3	Frost Island or Oriental Fishtail	TA/EW
47	45	20			Surface	1.38	Shriver/Helderberg	Projectile Point	Absent	broken	22		4.2	Levanna	LW
17	344.9	447.8			Surface	3.65	Rhyolite	Projectile Point	Absent	tip			7.25		
76	155	50			Surface	4.81	Shriver/Helderberg	Projectile Point	Absent	broken		20.8	8.4	Untyped,	
195	215	52		13	Ap	2.47	Shriver/Helderberg	Projectile Point	Indeterm	whole	2.07	1.87	6.2	untyped, stemmed	
102	210	120			Surface	3.23	Shriver/Helderberg	Projectile Point	Absent	base			6.2	Untyped, straight stem	
1	555.2	409.9			Surface	12.32	Black chert	Early-Stage Biface	Block	broken			11.4		
16	333.6	439.65			Surface	11.42	Black chert	Middle-Stage Biface	Absent	medial		28.1	11.4		
212	210	47		20	Ap	20.28	Rhyolite	Middle-Stage Biface	Absent	medial		41.2	10		
52	85	15			Surface	25.08	Shriver/Helderberg	Middle-Stage Biface	Absent	whole	51.1	32.3	13.6		
7	417	316.4			Surface	5.93	Rhyolite	Late-Stage Biface	Absent	broken			5.2		
15	451.5	439.11			Surface	7.38	Dark gray chert	Late-Stage Biface	Absent	base			12.4		
189	236	50		10	Ab	5.01	Indeterminate Chert	Late-Stage Biface	Absent	broken	3.66		0.71		
25	356.4	371			Surface	9.27	Rhyolite	Late-Stage Biface	Absent	whole	45.5	26	8.3		
28			A4		Ap	4.37	Black chert	Indeterminate Biface	Absent	medial			8		
84	165	30			Surface	3.52	Shriver/Helderberg	Indeterminate Biface	Absent			23.9	7.3		
57	95	125			Surface	11.35	Shriver Helderberg	Indeterminate Biface	Absent				15.6		
125	240	20			Surface	1.79	Onondaga-like	Indeterminate Biface	Absent				7.3		
37					Surface	71.69	Black chert	Freehand Core	Block		58.3	53.1	24.9		
159	170	32		2	Ap	0.92	Onondaga	Notched Flake	Absent	broken		2.3	0.41		
75	155	35			Surface	1.39	Shriver/Helderberg	Notched Flake	Absent	broken		16.7	4.2		
4	557.8	324.1			Surface	5.13	Dark gray chert	Utilized Flake	Absent		28.1	27	6.3		
105	215	55			Surface	3.48	Dark Greenish Gray Chert	Utilized Flake	Cobble	whole	25.2	18.8	6.3		
50	60	15			Surface	2.9	Shriver/Helderberg	Utilized Flake	Indeterm	whole	28.1	19.8	4.2		
112	225	30			Surface	2.57	Shriver/Helderberg	Utilized Flake	Block		21.9	16.7	6.3		

*Paleo=Paleoindian; LA=Late Archaic, TA/EW=Terminal Archaic/Early Woodland, LW=Late Woodland

Of the four nondiagnostic projectile points, three were manufactured from Shriver/Helderberg chert. These include one complete untyped stemmed point (FS 195) that has been extensively reworked, one untyped specimen (FS 76) that is missing its base, and one untyped straight stemmed point base (FS 102) (see Photograph 19-23). One rhyolite point tip (FS 17) was also recovered.

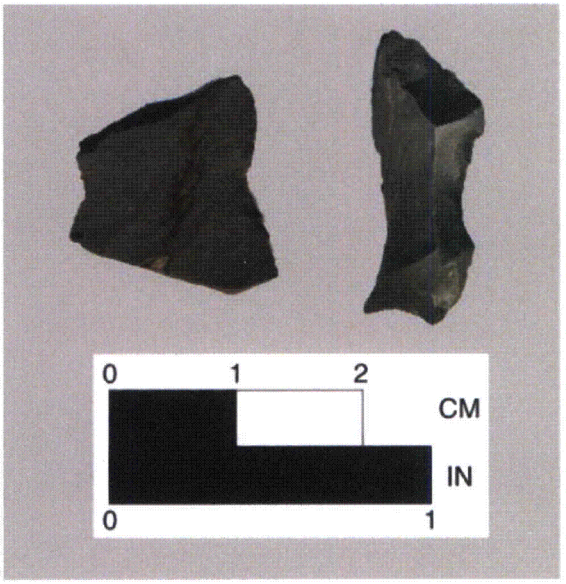
The single early-stage biface (FS 1) in the assemblage is a broken specimen made from black chert (see Table 19-16). The three middle stage bifaces include one complete specimen (FS 52) (Photograph 19-24) and two medial fragments. The sample of four late-stage bifaces consists of one complete specimen (FS 25) made from rhyolite (see Photograph 19-24), as well as one basal fragment and two broken specimens. The four indeterminate bifaces all represent specimens that are too fragmentary to allow further classification.



Photograph 19-24. Site 36LU288: Sample of Bifaces—Late-Stage Biface (FS 25), Middle-Stage Biface (FS 52)

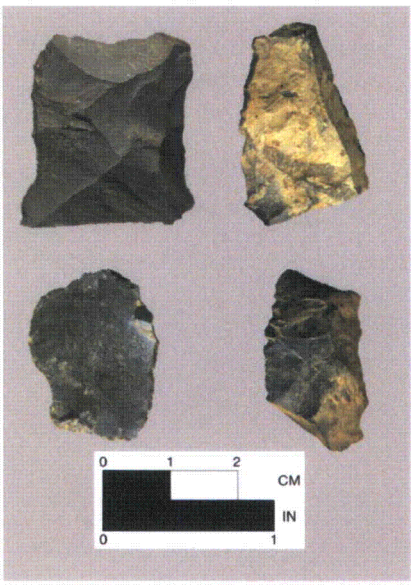
Unifaces

The sample of unifaces (*n*=6) includes two notched flakes and four utilized flakes; no formal unifacial tools were recovered. Shriver/Helderberg chert was used to manufacture three of these tools (see Table 19-16). The two notched flakes (FS 75 and 159) are both small specimens (0.92 g and 1.39 g) that exhibit unifacial retouch in a shallow notch along one margin (Photograph 19-25). Such tools served to scrape and/or shape wood or bone implements.



Photograph 19-25. Site 36LU288: Notched Flakes (FS 75 and FS 159)

The four utilized flakes (FS 4, 50, 105 and 112) each show evidence of use wear along one margin (Photograph 19-26). These flakes vary in weight (2.9 g, 2.57 g, 3.48 g, and 5.13 g) but are all above the mean flake weight for the assemblage (1.65 g). Three of the four utilized flakes retain cortex. Utilized flakes represent temporary, expedient tools used for a variety of cutting and scraping tasks.



Photograph 19-26. Site 36LU288: Utilized Flakes
(Top—FS 4 and FS 50, Bottom FS 105 and FS 112)

The small number of unifaces (notched or utilized flakes) in the assemblage indicates a limited use of expedient tools for cutting/scraping tools activities. All of the unifaces were recovered from the surface or the Ap horizon. Five of the six unifaces were recovered from the northwest quadrant of the site in a widely dispersed scatter (see Figure 19-21).

Photograph 19-27. Site 36LU288: Freehand Core (FS 37)

Cores

The single core in the site assemblage is a freehand core of black chert (FS 37) (Photograph 19-27). A freehand core is defined here as a cobble or block of raw material that has had flakes detached, but that has not been shaped into a tool or used for other tasks. This specimen retains block cortex, suggesting that the raw material was obtained from a primary bedrock outcrop. FS 37 was recovered from the plow-disturbed surface.

Debitage

Phase Ib and II investigations of Site 36LU288 produced 247 pieces of debitage, representing approximately three quarters (74.4 percent) of the total lithic artifacts (*n*=332; including FCR) and 90 percent of all chipped stone artifacts (*n*=275) (see Table 19-11). The debitage assemblage includes 87 biface reduction flakes, 9 block shatter, 13 decortication flakes, 14 early reduction flakes, 123 flake fragments and 1 bipolar reduction flake (Table 19-17).

As presented in Table 19-16, over three quarters (*n*=190; 76.9 percent) of the debitage was recovered from plow-disturbed surface or Ap horizon contexts. The remaining debitage was found largely in the Bw horizon (*n*=47; 19 percent), while the Ab horizon produced just three flakes, and the two prehistoric features yielded between three and four flakes each.

Table 19-17. Site 36LU288: Crosstabulation of Flake Type by Soil Horizon

Soil Horizon	Biface Reduction	Bipolar Flake	Block Shatter	Decortication	Early Reduction	Flake Fragments	Total	%
Surface	11	1	1	6	7	42	68	27.53%
Ap	50		4	4	4	60	122	49.39%
B	24		4	3	3	13	47	19.03%
Ab	2					1	3	1.21%
Feat 1						4	4	1.62%
Feat 2						3	3	1.21%
TOTAL	87	1	9	13	14	123	247	100.00%

Seventeen lithic raw material types were identified in the debitage sample (Table 19-18). As with the overall artifact assemblage, Shriver/Helderberg chert is the most common raw material, accounting for 51.8 percent (*n*=128) of the flakes. It is followed in much lower frequencies by Onondaga-like chert (*n*=29; 11.7 percent), black chert (*n*=22; 8.9 percent), gray chert (*n*=18; 7.3 percent) and rhyolite (*n*=12; 4.9 percent). The remaining raw materials each represent less than 4 percent of the total debitage.

Table 19-18. Site 36LU288: Phase Ib and II Debitage, Crosstabulation of Flake Type by Lithic Raw Material

Raw Material	Bipolar Reduction	Bipolar Reduction	Block Shatter	Decortication	Early Reduction	Flake Fragments	Total	%
Bald Eagle Jasper (red)						1	1	0.40%
Black chert		1	1	3	2	10	22	8.91%
Blue-gray Chert						1	3	1.21%
Chalcedony						1	1	0.40%
Dark gray chert						1	3	1.21%
Gray Chert			3	1	2	5	18	7.29%
Gray grainy					1	3	5	2.02%
Gray translucent						3	9	3.64%
Indeterminate Chert						3	4	1.62%
Jasper						2	3	1.21%
Onondaga-like			2	5	1	14	29	11.74%
Oolitic				1		1	4	1.62%
Quartz			1			1	2	0.81%
Rhyolite					1	8	12	4.86%
Sandstone					1		1	0.40%
Shriver/Helderberg			2	2	6	68	128	51.82%
Tan Chert				1		1	2	0.81%
TOTAL		1	9	13	14	123	247	100.00%

Cortex was recorded on 18.2 percent (*n*=45) of the debitage sample, including 11 of the 17 lithic raw material types (Table 19-19). Of those specimens with identifiable cortex, 14 flakes (manufactured from Shriver/Helderberg, black chert and gray chert) exhibit block cortex and 28 flakes (made from eight different raw material) retain cobble cortex; cortex is present but indeterminate on nine flakes. Cortex occurs largely on specimens of Shriver/Helderberg chert, Onondaga chert, black chert and gray chert, with one to two cortical specimens observed within six other raw material types. Cortex observed on Shriver/Helderberg chert debitage consists predominantly of block type (*n*=9, 7.0 percent of total Shriver/Helderberg debitage), while cortex on Onondaga chert specimens is exclusively cobble type (*n*=11, 37.9 of total Onondaga debitage). Black chert and gray chert specimens exhibit both block and cobble cortex. Analysis of cortical surfaces on the debitage sample supports the interpretation of Shriver/Helderberg chert as being obtained predominantly from primary sources (block cortex) and of Onondaga chert as occurring as secondary cobble sources (cobble cortex).

The analysis of debitage recorded flake type for each specimen. Decortication, early reduction, and block shatter flake types are characteristic of early stages of lithic reduction. Biface reduction flakes represent middle to late-stage reduction, usually associated with the manufacture of bifacial tools or the refurbishing of projectile points. Flake fragments are not diagnostic of specific stages of lithic reduction.

Table 19-19. Site 36LU288: Crosstabulation of Cortex Type by Lithic Raw Material

Raw Material	Absent	Block	Cobble	Indeterminate	Total	%
Bald Eagle Jasper (red)	1				1	0.40%
Black chert	14	4	2	2	22	8.91%
Blue-gray Chert	2		1		3	1.21%
Chalcedony	1				1	0.40%
Dark gray chert	3				3	1.21%
Gray Chert	12	1	5		18	7.29%
Gray grainy	3		1	1	5	2.02%
Gray translucent	9				9	3.64%
Indeterminate Chert	3			1	4	1.62%
Jasper	3				3	1.21%
Onondaga-like	18		11		29	11.74%
Oolitic	3			1	4	1.62%
Quartz	2				2	0.81%
Rhyolite	11		1		12	4.86%
Sandstone			1		1	0.40%
Shriver/Helderberg	116	9		3	128	51.82%
Tan Chert	1		1		2	0.81%
TOTAL	**202**	**14**	**23**	**8**	**247**	**100.00%**

Of the 247 flakes in the debitage sample, 35.2 percent (*n*=87) are classified as biface reduction flakes. By contrast, flake types representative of early stage lithic reduction (decortication, early reduction, block shatter) constitute 14.6 percent (*n*=36) of the total debitage. Nearly one half (*n*=123; 49.8 percent) of the recovered debitage consists of nondiagnostic flake fragments. Based on this overall analysis, later stage lithic reduction activities were more common at the site than were initial lithic reduction activities.

When flake type distribution is examined by individual raw material types other patterns are observed. For locally-available Shriver/Helderberg chert, the dominant raw material type in the assemblage, flake type analysis indicates that 39.0 percent (*n*=50) of the Shriver/Helderberg debitage consists of biface reduction flakes, while only 7.8 percent (*n*=10) is associated with early stage lithic reduction (combined categories of decortication, early reduction and block shatter). In contrast, for Onondaga chert and black chert debitage (represented by a total of 29 and 22 flakes, respectively) the percentage of flake types characteristic of early stage lithic reduction (27.6 and 27.3 percent, respectively) is slightly higher than the percentage of later stage biface reduction flakes (24.1 and 22.7 percent, respectively). Of the 18 gray chert flakes, 38.9 percent (*n*=7) are biface reduction flakes and 33.3 percent (*n*=6) are associated with early stage lithic reduction. The sample of 12 rhyolite flakes includes 3 biface reduction flakes (25.0 percent) and one early reduction flake (8.3 percent).

This pattern of flake type distribution suggests an emphasis on later stage lithic reduction of locally-available Shriver/Helderberg chert. The majority of this material likely arrived at the site in the form of partially-worked bifaces, which were further reduced or resharpened on site; a limited amount of early stage reduction of this raw material also occurred at the site. A limited amount of both early and later stage reduction of Onondaga chert, black chert and gray chert was likely conducted at the site. Such interpretations of these three materials, and of the remaining raw materials, may be skewed by small sample size.

Fire-Cracked Rock (FCR)

Fifty-seven pieces of FCR were recovered from the site (see Table 19-11). Nearly three quarters (70 percent, *n*=40) of the FCR was sandstone, with the remainder consisting of quartz (*n*=9) and quartzite (*n*=8). Three quarters of the FCR was recovered from feature fill (Feature 1 = 29 FCR and Feature 2 =18 fragments). The remaining 14 FCR were found in surface (n-1), plowzone (n-1), Bw horizon (*n*=4) and Ab horizon (*n*=8) contexts; eight of these were recovered from the block excavation (TU 11, 14, 15, and 16) associated with Feature 1.

Historic Artifact Assemblage

The sample of 137 historic artifacts recovered from the site consists predominantly of kitchen-related specimens (76.6 percent, *n*=105), along with lower frequencies of architectural debris (17.5 percent) and activities-related items (5.1 percent) (Table 19-20). The kitchen artifacts largely represent bottle/jar glass (*n*=84,) as well as redware, whiteware, ironstone and porcelain ceramics (*n*=19). The sample of architectural specimens includes window glass (*n*=21) and three indeterminate nail fragments. The activities-related artifacts consist of two hooks and single fragments of chain link, a tail light, a terra cotta flowerpot, a wrench and a whiteware figurine.

Table 19-20. Site 36LU288: Phase Ib and Phase II Historic Artifact Pattern Analysis

Class	Sub-Class	Ware Type/Object	Count	%
Activities	Activities-Other	chain link	1	0.73%
	Automobile Related	tail light	1	0.73%
	Flowerpots	terra cotta	1	0.73%
	Hand Tools	crescent wrench, fragment	1	0.73%
	Household Items	whiteware, plain figurine	1	0.73%
	Misc. Hardware	hook	2	1.46%
		Activities Total	**7**	**5.11%**
Architecture	Nails,Spikes,Etc.	nail, indeterminate	3	2.19%

Class	Sub-Class	Ware Type/Object	Count	%
	Window Glass	window glass	21	15.33%
		Architecture Total	**24**	**17.52%**
Kitchen	Bottles/Jars	beer bottle	3	2.19%
		bottle glass	79	57.66%
		jar glass	1	0.73%
		milk bottle	1	0.73%
	Ceramics	hardpaste porcelain, underglaze handpainted	1	0.73%
		ironstone, plain	1	0.73%
		redware, glazed	7	5.11%
		redware, paste	1	0.73%
		redware, unglazed	5	3.65%
		whiteware, plain	4	2.92%
	Decorative Table Glass	glass tableware	1	0.73%
	Kitchen-related-Other	canning jar lid liner	1	0.73%
		Kitchen Total	**105**	**76.64%**
Unidentifiable	Indeterminate	glass	1	0.73%
		TOTAL	137	100.00%

The historic artifact sample contains 22 temporally diagnostic specimens, predominantly bottle/jar glass and ceramics (Table 19-21). The 15 pieces of diagnostic bottle/jar glass include one blown in mold specimen (1800 to 1870), one cobalt blue fragment (1890 to 1960), and two with maker's marks that date to the second quarter of the twentieth century; the remaining fragments of bottle glass (e.g. machine made, applied color label, and stippled specimens) have date ranges that extend to the present. Diagnostic ceramics include one fragment of plain ironstone exhibiting a maker's mark (1866 to 1875) and five pieces of plain whiteware (1830 to 2008). Also included in the assemblage is a single canning jar lid liner (1869 to 1950). In total, the temporally diagnostic artifacts provide a mean date of 1936 and a *terminus post quem* (TPQ) of 1939 for the historic artifact assemblage.

As noted previously, these artifacts represent a very low density field scatter associated with cultivation activities within this large agricultural field. They do not represent an historic archaeological site.

Table 19-21. Site 36LU288: Phase Ib and Phase II, Dating Analysis Historic Artifacts

Ware Type/Object	Reference	Begin Date	End Date	Count
whiteware, plain	Price 1979; Noël Hume 1980	1830	2008	5
ironstone, plain, maker's mark: ..RIAL; ..one china; ..chetwyn..	www.thepotteries.org/allpotters/284.htm	1866	1875	1
canning jar lid liner	Toulouse 1971	1869	1950	1
bottle glass; maker's mark: R in a triangle	Toulouse 1971: 432	1927	1956	1
bottle/jar glass; blown in mold	Deiss 1981	1800	1870	1
bottle/jar glass; machine made	Deiss 1981	1903	2008	2
bottle/jar glass; applied color label	Deiss 1981: 95	1935	2008	1
bottle/jar glass; stippled; makers mark Brockway Glass Co.	Busch 1983; Toulouse 1971; Deiss 1981	1939	2008	1
bottle/jar glass; Owen Illinois maker's mark; stippled	Toulouse 1971; Busch 1983	1939	1954	1
bottle/jar glass; cobalt	IMAC 1984	1890	1960	3

Ware Type/Object	Reference	Begin Date	End Date	Count
bottle/jar glass; Glenshaw Glass Co. maker's mark	Toulouse 1971	1932	2008	1
bottle/jar glass; stippled	Busch 1983	1939	2008	4
			TOTAL	22
			Mean	1936.0
			TPQ	1939

Settlement Pattern Analysis

In order to assist in the evaluation of Site 36LU288, a comparison with nearby prehistoric sites was undertaken, using data available through the PHMC-BHP's on-line Cultural Resources Geographic Information System (CRGIS). This on-line database lists 140 prehistoric sites within the surrounding Central Susquehanna River Watersheds B and D, with 107 having datable components. Utilizing the CRGIS, the number of recorded prehistoric sites and areas of professional archaeological survey was examined for a roughly 4 mile (6.4 kilometer) radius around Site 36LU288. This data was grouped into three categories based on basic landform regions--lowlands, uplands, and transitional. The lowlands include the Susquehanna floodplain and what appears to be the first terrace. The uplands consist of elevated broad areas consisting of flat land and rolling hills. Finally, the transitional area includes the tributary valleys of the Susquehanna and the more rugged slopes and undulating hills positioned between the lowlands and the uplands.

Within the 4-mile (6.4-kilometer) radius area roughly equal areas of lowlands (532 ha [1,315 ac]) and uplands (566 ha [1,399 ac]) have been subjected to archaeological survey, with the transitional areas between the two being subjected to substantially more survey (1,275 ha [3,150 ac] – primarily due to the performance of one large project covering much of a single tributary valley). Within the professionally-surveyed portions of these three landform categories, no prehistoric sites have been recorded in the transitional area, only two prehistoric sites have been recorded in the uplands, and 17 prehistoric sites have been recorded in the lowlands. Twelve additional prehistoric sites have been recorded in the lowlands by informant interview or avocational survey. Of the total 29 recorded sites within the lowlands, two occur on islands, six occupy terrace landforms, and 21 are located on floodplains; Site 36LU288 is one of the recorded floodplain sites.

Based on the results of the current GAI studies (this report) and prior surveys by other consultants (Bohlin and Braun 1995; Hayes et al. 1981) performed on the right bank (west floodplain) of the Susquehanna River within the Bell Bend project vicinity, it appears that all of the prehistoric sites contained within the floodplain, including 36LU288, are situated on remnant levees or other low micro-topographic rises above the broader floodplain. This trend has been documented elsewhere in the Susquehanna Valley and is a common pattern noted in other large river valleys. Presumably, these slightly elevated areas provided a consistently drier setting that was subjected to less flooding than the surrounding floodplain, yet still afforded easy access to desired resources of the valley bottoms.

As previously shown by the background research (see Chapter 4, Table 4-2), with the exception of one cemetery and two longer-term camps (all three in the lowlands), the recorded sites in this area are generally multi-component short-term camps that represent locales which were repeatedly reused over hundreds or even thousands of years. Temporal periods represented span from the Early Archaic through the Late Woodland. However, no distinct settlement pattern is apparent based on chronology.

The prehistoric use of the study area around 36LU288 seems to show a focus on short duration resource procurement forays. The presence of a Native American cemetery site (the Knouse Site/36LU43) in the vicinity is an anomaly that is only representative of a contact/historic period use. Some of the sites may be temporary camps for mobile groups revolving around seasonal availability of resources, while others may represent short-term satellite camps for the purposes of supplying a nearby semi-sedentary or sedentary group perhaps occupying a village. Each of these scenarios may be represented at the same site but for different periods of use. Two possible village sites have been identified in the vicinity, one located across the river on the east bank (the Sapphire Site/36LU90) just upstream and one on the west bank approximately 6 km (4 mi) downstream (Beach Haven I/36LU270).

Based on the results of GAI's Phase II study, Site 36LU288 consists of a low-density lithic scatter (*n*=275 flaked stone and 57 FCR) and two fire-related cultural features (each of which exhibited no evidence of subsistence remains and contained only three and four micro flakes recovered during flotation of feature fill). Of the nine other recorded sites on the same floodplain (Table 19-22, see Figure 4-1), only two contain identified cultural features. At one of those sites (36LU16) the features yielded lithics, ceramics, and bone. The average recovered flaked stone artifact count for all nine sites is 122, with a range of 6 to 360. These nine sites represent a wide range of temporal periods, and four of the sites contain diagnostics from multiple periods. The temporal periods of all ten sites, including 36LU288, are comprised of possible Paleoindian, Late Archaic, Transitional, Early Woodland, Middle Woodland, and Late Woodland. Site 36LU288, as multi-component, low-density artifact scatter, is consistent with the majority of the previously recorded lowland sites in the project vicinity. The artifact count is low (total of 332), and although cultural features were identified, these features lack evidence of subsistence remains and produced only three to four micro flakes each. The physical setting of Site 36LU288 also is common for short-term camps within this area. Like Site 36LU288, the nine other sites recorded on the same floodplain are located on the edge and/or crest of levees or other areas slightly elevated above the surrounding floodplain (see Figure 4-1). Overall, Site 36LU288 appears to be typical of the many other sites on the same landform, both in its limited cultural material and setting.

Table 19-22. Recorded Archaeological Sites within the Floodplain near Site 36LU288

Site Number	Temporal Period	Flaked Stone Count	Features
36LU0015	Late Archaic	330	None
36LU0016	Late Archaic, Early Woodland, Middle Woodland, Late Woodland	360	3 features; lithics, ceramics, bone
36LU0017	Late Archaic, Transitional, Late Woodland	26	None
36LU0048	Unknown Prehistoric	6	None
36LU0049	Late Archaic, Transitional, Early Woodland, Late Woodland	146	1 feature; lithics
36LU0050	Late Archaic	145	None
36LU0051	Late Woodland	61	None
36LU0052	Late Archaic, Transitional, Early Woodland	8	None
36LU183	Early Archaic	19	None

Summary and Evaluation

Site 36LU288 is situated in a cultivated field on a low terrace/floodplain adjacent to the North Branch Susquehanna River. This landform has a gently undulating surface with two shallow northwest/southeast oriented swales representing former stream channels/flood chutes of the Susquehanna River, and the slightly higher elevation areas to their east and west consisting of natural levee remnants. The site consists of a low-density prehistoric lithic scatter with dimensions of 152x260 meters (500x850 feet). Phase I and II investigations yielded 332 prehistoric artifacts and 137 historic artifacts and identified two prehistoric hearth features. Based on the recovery of diagnostic projectile points and the radiocarbon dating of two Late Archaic hearth features, the site consists of the remains of multiple, Paleoindian, Late Archaic, Transitional/Early Woodland and Late Woodland prehistoric occupations.

The prehistoric artifacts consisted entirely of lithics, manufactured primarily from locally available Shriver/Helderberg chert, along with lower frequencies of other chert types. Analysis of lithic raw material types indicates a reliance on locally occurring raw materials, along with more limited trade and/or travel to source areas including central Pennsylvania and the southern Pennsylvania/Maryland.

The relatively higher percentage of middle to late stage bifaces and of later-stage lithic reduction debitage suggests that the focus of lithic reduction activities at the site was the manufacture and/or maintenance of bifaces or other formal tools. A limited amount of early stage lithic reduction also occurred. In addition, the recovery of six unifaces (notched and utilized flakes) indicates that site occupants used expedient tools for cutting and scraping activities, likely associated with preparation of hides, wood or other soft material.

Prehistoric artifacts occurred in a widely dispersed, low-density scatter across the large cultivated field, with a slight concentration in the northern portion of the field. No distributional patterning was observed for diagnostic projectile points (including two Paleoindian points, one Late Archaic Brewerton point, one Terminal Archaic/Early Woodland Frost Island or Orient Fishtail specimen, and one Late Woodland Levanna point); these artifacts appear to be scattered across the site. Additionally, with the exception of two Paleoindian points, each identified temporal period is represented by only one diagnostic specimen.

Stratigraphically, two-thirds of the prehistoric assemblage, including 27 of the 28 tools and all five diagnostic specimens, were found in plow-disturbed contexts (surface and Ap horizon). Accordingly, the nondiagnostic flaked stone artifacts cannot be segregated by individual components.

A discontinuous buried A horizon was documented in localized areas on the slightly higher-elevation levee remnants in the northern portion of the site.This horizon, encountered at depths of 51 to 66 cm below surface, represents a former stable ground surface that was covered by rapid deposition.The buried A horizon produced one prehistoric Late Archaic hearth feature (Feature 1) and 41 nondiagnostic artifacts—of which 33 (80 percent) were fire-cracked rock. Outside of the block excavation (TUs 11, 14, 15, and 16) associated with Feature 1, only three artifacts were recovered from the Ab horizon (TU 10). Based on this data, the Ab horizon is characterized by an extremely low-density prehistoric artifact scatter, focused on the location of Feature 1. Accordingly, the Ab horizon on Site 36LU288 does not appear to represent a long-term or heavily utilized prehistoric living surface.

Both prehistoric features were located in the northeast quadrant of the site and, although found in different stratigraphic contexts, were similar in form, content and age. Feature 1 occurred in the buried A horizon at a depth of 66 cm (2.2 feet) below ground surface and

yielded a Late Archaic date of 3710+/- 40 BP (Beta 275531). Feature 2, the truncated remains of a second Late Archaic prehistoric hearth (3420+/- 40 BP/Beta 275532), was exposed at the Ap/B horizon contact, at a depth of 40 cm (1.3 feet) below surface. Artifacts associated with both features consisted almost exclusively of fire-cracked rock; chipped stone artifacts were limited to three or four nondiagnostic micro flakes recovered during laboratory processing of flotation samples. Both features lacked evidence of subsistence remains. Additionally, neither feature area was characterized by an increase in artifact density. Based on these data, Features 1 and 2 were likely used for heat and, possibly, for cooking.

Phase Ib and Phase II investigations indicate that the integrity of Site 36LU288 is mixed. Disturbances within the site appear to be limited to cultivation, along with possible erosion associated with the former stream channels. The identification of Feature 1 indicates that the site contains small areas of intact cultural deposits. Feature 2, however, was truncated by plowing. Most importantly, separate prehistoric components at the site cannot be segregated horizontally or vertically, as highlighted by the recovery of Paleoindian through Late Woodland diagnostic artifacts from surface/plowzone contexts in a dispersed scatter across the site.

Due to the site's mixed, multicomponent nature, low artifact density, and primarily plow-disturbed context, GAI recommends that prehistoric materials in the upper-soil profile (<80 cm/2.6 feet) of Site 36LU288, investigated by the current Phase II study, do not meet the minimum criteria for listing on the NRHP. Although the buried A horizon identified in scattered localities within the northern portion of the site has a potential for additional intact prehistoric cultural materials, the near-absence of artifacts associated with this soil horizon, as well as its extremely localized extent, suggests that its information potential is limited. Further investigations at this site would likely yield redundant data. In the event that modifications in project design should result in deeper impacts within Site 36LU288, additional Phase II Site Evaluation may be required to investigate more deeply buried deposits in this locality.

Site 36LU288 Recommendations

Site 36LU288 is a low-density, multicomponent prehistoric site representing the remains of small, short-term, Paleoindian, Late Archaic, Terminal Archaic/Early Woodland, and Late Woodland occupations on a low terrace/floodplain adjacent to the North Branch Susquehanna River. Due to the shallow proposed depth of project impact, GAI's Phase Ib and II studies investigated only the upper portion of the soil profile (approximately 0-80 cm /0-2.6 feet below surface) in this locality. Based on the results of this work, Site 36LU288 has a mixed integrity; it retains small areas of intact cultural deposits (i.e. Feature 1 area) but the majority of the site has poor integrity, as characterized by mixed Paleoindian through Late Woodland diagnostic projectile point found in a surface/plowzone context and nondiagnostic remains that cannot not be segregated by individual components. Phase I and II investigations yielded 332 prehistoric artifacts and 137 historic artifacts and identified two Late Archaic prehistoric hearth features. Prehistoric artifacts occurred in a dispersed scatter across the large cultivated field, with a concentration in the northern portion of the field. Two-thirds of the prehistoric assemblage, including 27 of the 28 tools and all diagnostic specimens, were found in plow-disturbed contexts (surface and Ap horizon). A discontinuous buried A horizon, documented in the northern portion of the site, produced one Late Archaic hearth feature (Feature 1) and 41 nondiagnostic artifacts, consisting largely of fire-cracked rock. Feature 2 (the second Late Archaic hearth) was identified at the Ap/B horizon contact. Both features primarily yielded FCR; no evidence of subsistence remains was found.

Based on the low density and mixed multicomponent nature of the recovered artifacts, and the near-absence of artifacts associated with the two prehistoric features, GAI recommends that prehistoric materials in the upper portion of the site's soil profile do not have a potential to contribute important information on the prehistoric occupation of this area. GAI recommends that the portion of Site 36LU288 investigated by this study is Not Eligible to the National Register under Criterion D. Accordingly, no further investigations of this site are recommended.

In the event that modifications in project design should result in deeper impacts within Site 36LU288, additional Phase II Site Evaluation may be required to investigate more deeply buried deposits.

Figure 19-1. Site 36LU288 Location

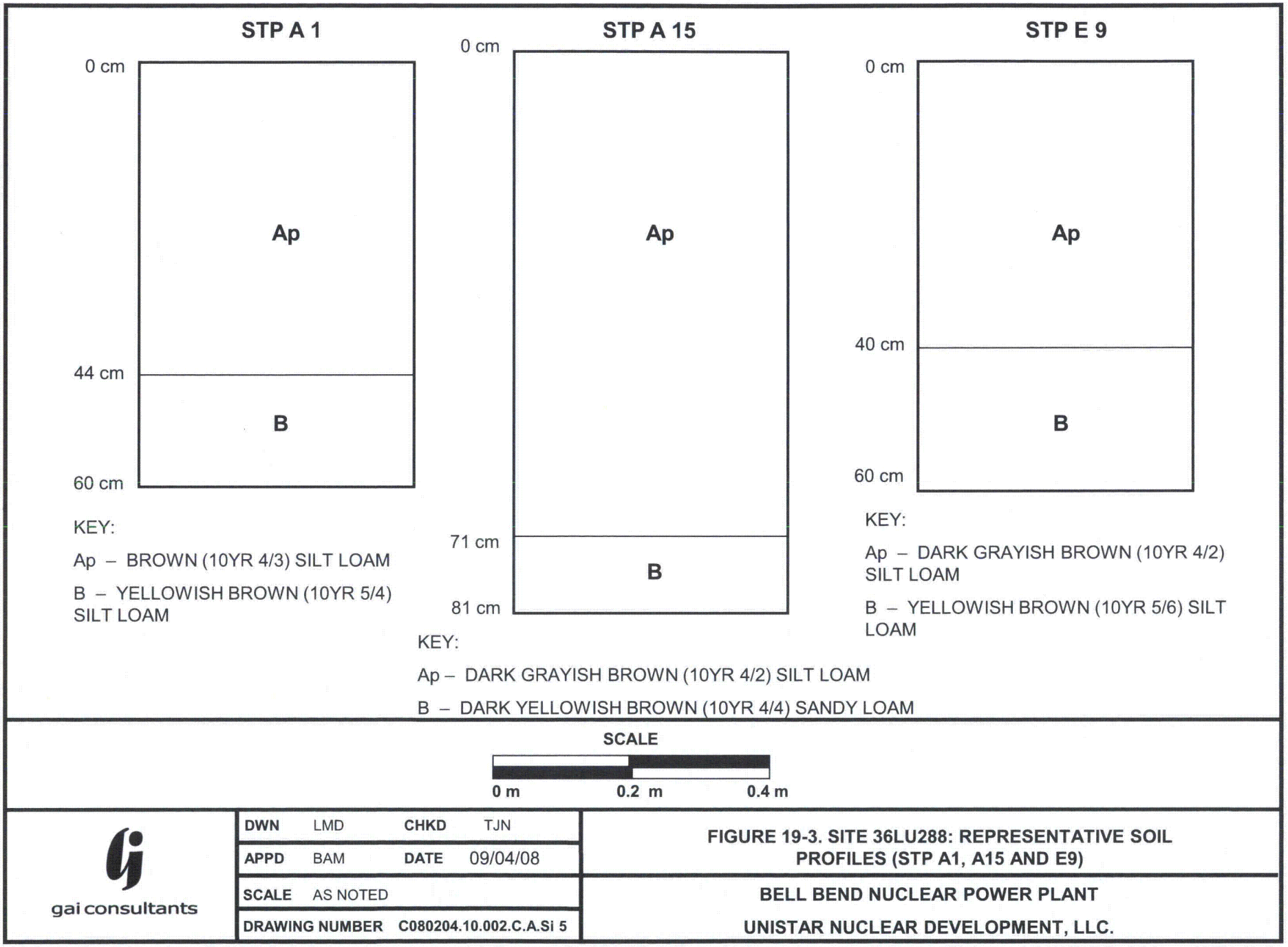
REDACTED Figure 19-1
Site 36Lu288 Location

Figure 19-2. Site 36LU288 showing Phase Ib Testing Locations
11x17

REDACTED Figure 19-2
Site 36Lu288 showing Phase Ib
Testing Locations

(back of 19-2)

Side two of REDACTED Figure 19-2



gai consultants

DWN	LMD	CHKD	TJN
APPD	BAM	DATE	09/04/08
SCALE	AS NOTED		
DRAWING NUMBER	C080204.10.002.C.A.Si 5		

FIGURE 19-3. SITE 36LU288: REPRESENTATIVE SOIL PROFILES (STP A1, A15 AND E9)

BELL BEND NUCLEAR POWER PLANT

UNISTAR NUCLEAR DEVELOPMENT, LLC.

(intentionally blank)

Figure 19-4. Site 36LU288: Phase II Testing Locations
B Size

REDACTED Figure 19-4
Site 36Lu288: Phase II Testing Locations

(back of 19-4)

[*Side two of REDACTED Figure 19-4*]

Figure 19-5. Site 36LU288: Phase II Testing Locations showing Distribution of Ab Horizon and Features

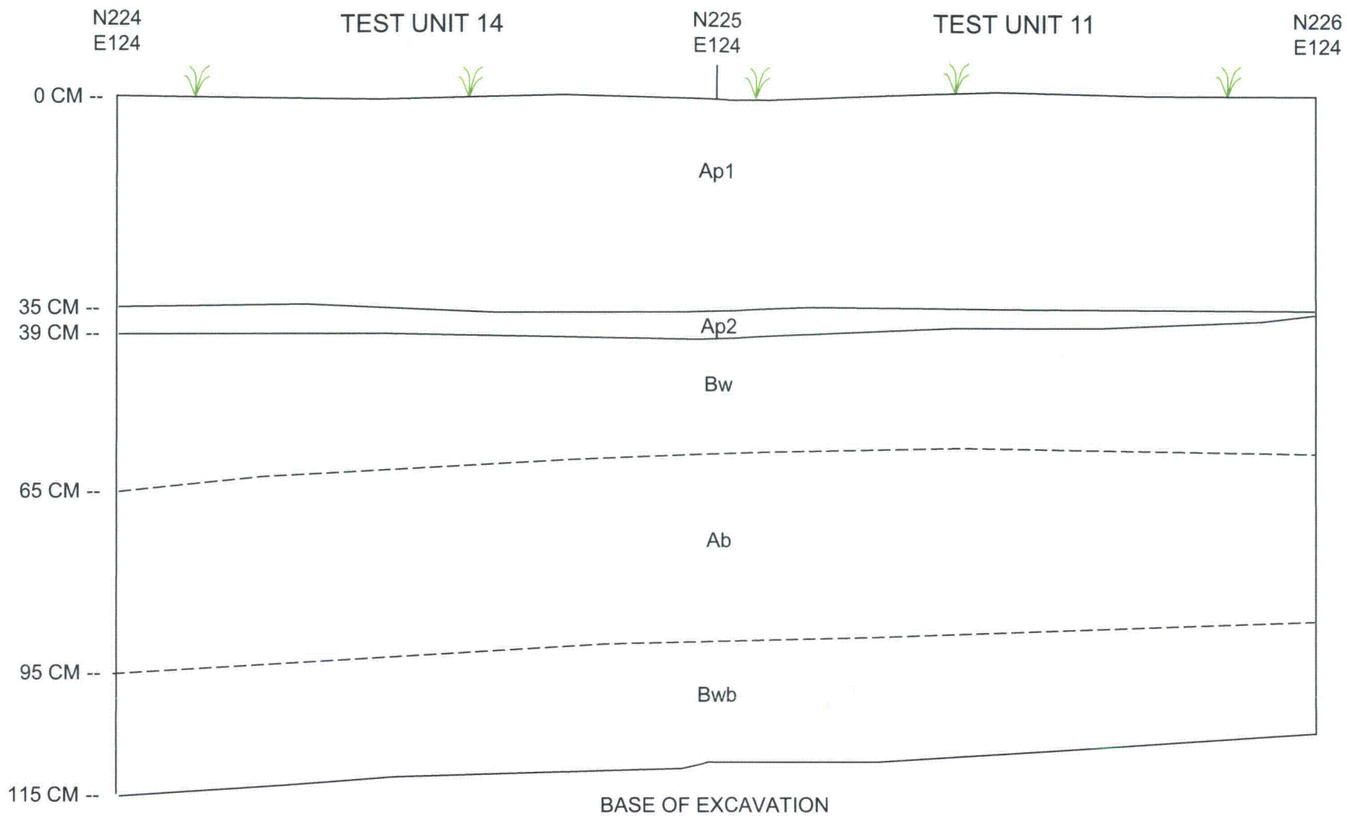
B Size

REDACTED Figure 19-5
Site 36Lu288: Phase II Testing Locations showing Distribution of Ab Horizon and Features

(back of 19-5)

Side two of REDACTED Figure 19-5

36LU288
TEST UNITS 14 AND 11
WEST WALL PROFILE



Ap1 – DARK GRAYISH BROWN (10YR 4/2) SILT LOAM
Ap 2 – BROWN (10YR 5/3) SILT LOAM
Bw – YELLOWISH BROWN (10YR 5/6) SILT LOAM
Ab – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
Bwb –YELLOWISH BROWN (10YR 5/4) SILT LOAM

LEGEND

– GROUND SURFACE

– DIFFUSE BOUNDARY

SCALE

0 CM 25 CM 50 CM

FIGURE 19-6.
SITE 36LU288: TEST UNITS 14 and 11
WEST WALL PROFILE

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BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.

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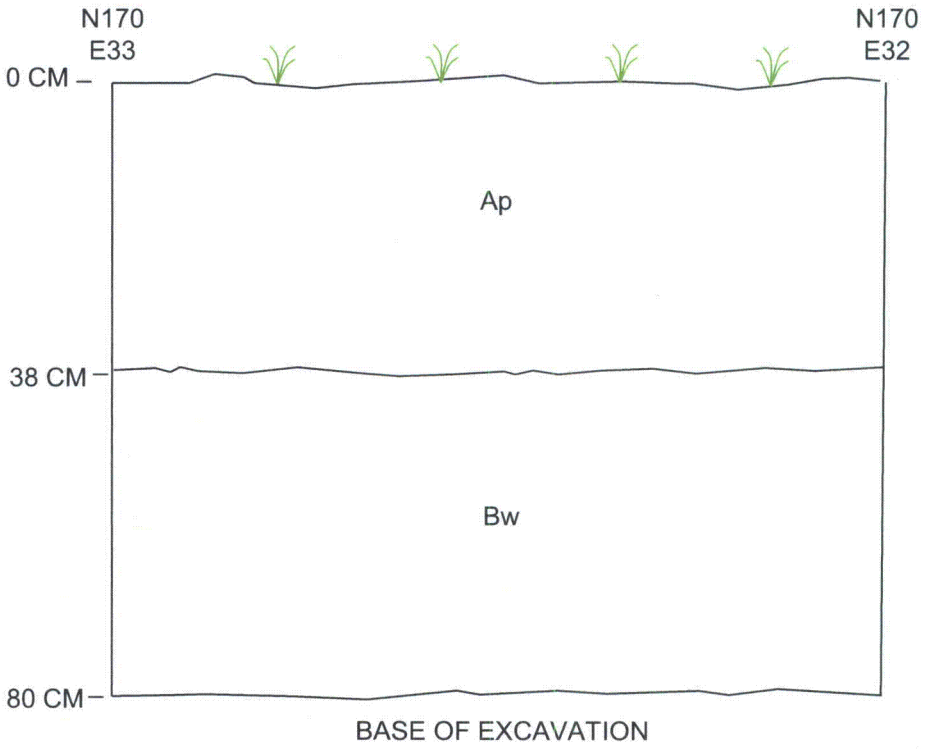
36LU288
TEST UNIT 2
SOUTH WALL PROFILE



Ap – BROWN (10YR 4/3) SILT LOAM
Bw – YELLOWISH BROWN (10YR 5//6) CLAY LOAM

LEGEND

GROUND SURFACE

SCALE

0 CM 25 CM 50 CM

FIGURE 19-7.
SITE 36LU288: TEST UNIT 2
SOUTH WALL PROFILE

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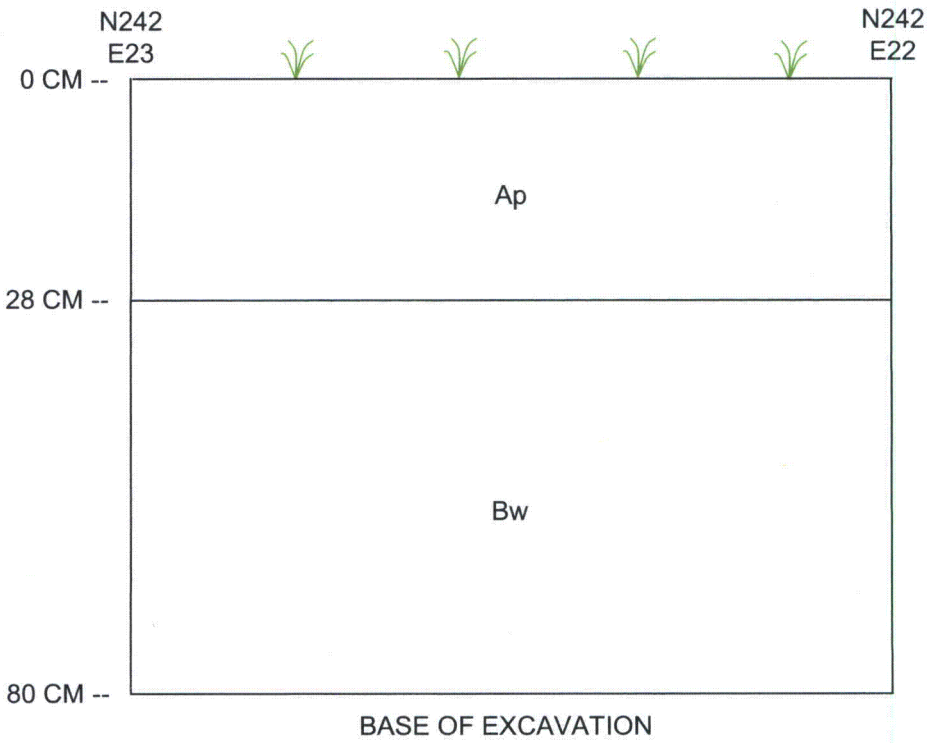
36LU288
TEST UNIT 8
SOUTH WALL PROFILE



Ap – BROWN (10YR 4/3) SILT LOAM
Bw – DARK YELLOWISH BROWN (10YR 4/6) CLAY LOAM

LEGEND

– GROUND SURFACE

SCALE

0 CM 25 CM 50 CM

FIGURE 19-8.
SITE 36LU288: TEST UNIT 8
SOUTH WALL PROFILE

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UNISTAR NUCLEAR DEVELOPMENT, LLC.

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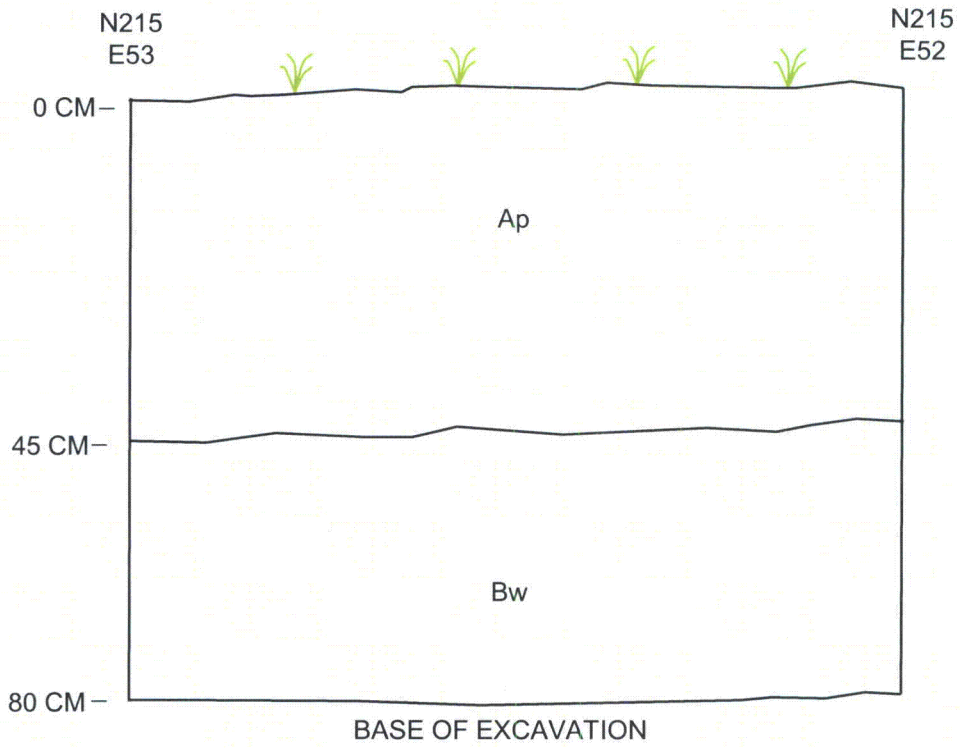
36LU288
TEST UNIT 13
EAST WALL PROFILE



Ap – BROWN (10YR 4/3) SILT LOAM
Bw – DARK YELLOWISH BROWN (10YR 4/6) SANDY SILT LOAM

LEGEND

– GROUND SURFACE

SCALE

0 CM 25 CM 50 CM

FIGURE 19-9.
SITE 36LU288: TEST UNIT 13
EAST WALL PROFILE

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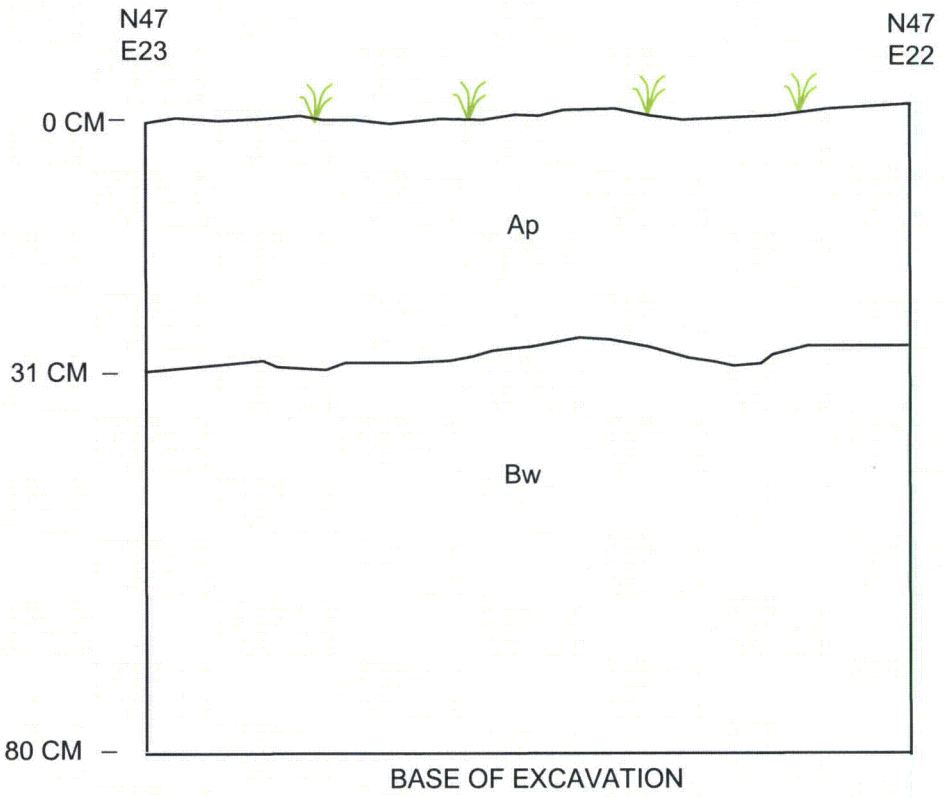
36LU288
TEST UNIT 19
SOUTH WALL PROFILE



Ap – BROWN (10YR 4/3) SILT LOAM
Bw – DARK YELLOWISH BROWN (10YR 4/6) SILT LOAM

LEGEND

– GROUND SURFACE

SCALE

0 CM 25 CM 50 CM

FIGURE 19-10.
SITE 36LU288: TEST UNIT 19
SOUTH WALL PROFILE

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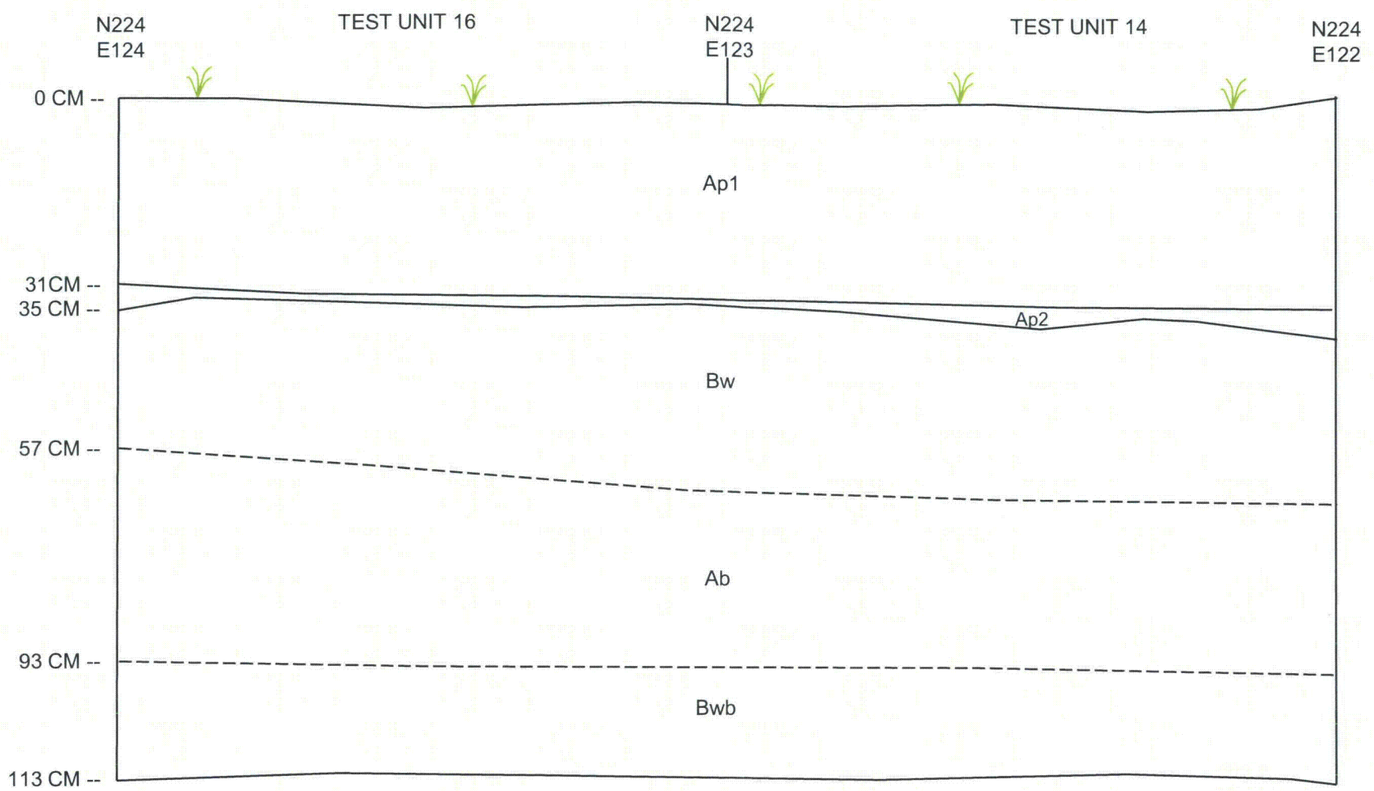
36LU288
TEST UNITS 16 AND 14
SOUTH WALL PROFILE



BASE OF EXCAVATION

Ap1 – DARK GRAYISH BROWN (10YR 4/2) SILT LOAM
Ap 2 – BROWN (10YR 5/3) SILT LOAM
Bw – YELLOWISH BROWN (10YR 5/6) SILT LOAM
Ab – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
Bwb –YELLOWISH BROWN (10YR 5/4) SILT LOAM

LEGEND

– GROUND SURFACE

– DIFFUSE BOUNDARY

SCALE

0 CM 25 CM 50 CM

FIGURE 19-11.
SITE 36LU288: TEST UNITS 16 and 14
SOUTH WALL PROFILE

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UNISTAR NUCLEAR DEVELOPMENT, LLC.

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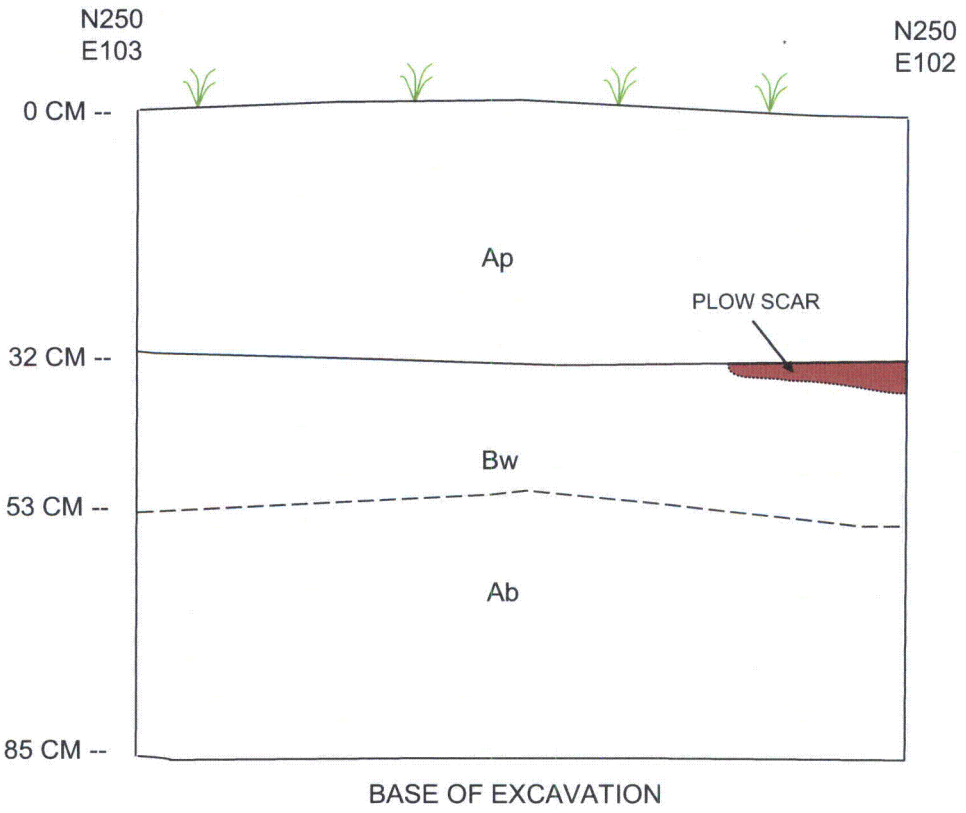
36LU288
TEST UNIT 12
SOUTH WALL PROFILE



Ap – DARK BROWN (10YR 3/3) SILT LOAM
Bw – YELLOWISH BROWN (10YR 5/4) SILT LOAM
Ab – DARK YELLOWISH BROWN (10YR 3/4) SILT LOAM

LEGEND

– GROUND SURFACE

– – – – – – DIFFUSE BOUNDARY

SCALE

0 CM 25 CM 50 CM

FIGURE 19-12.
SITE 36LU288: TEST UNIT 12
SOUTH WALL PROFILE

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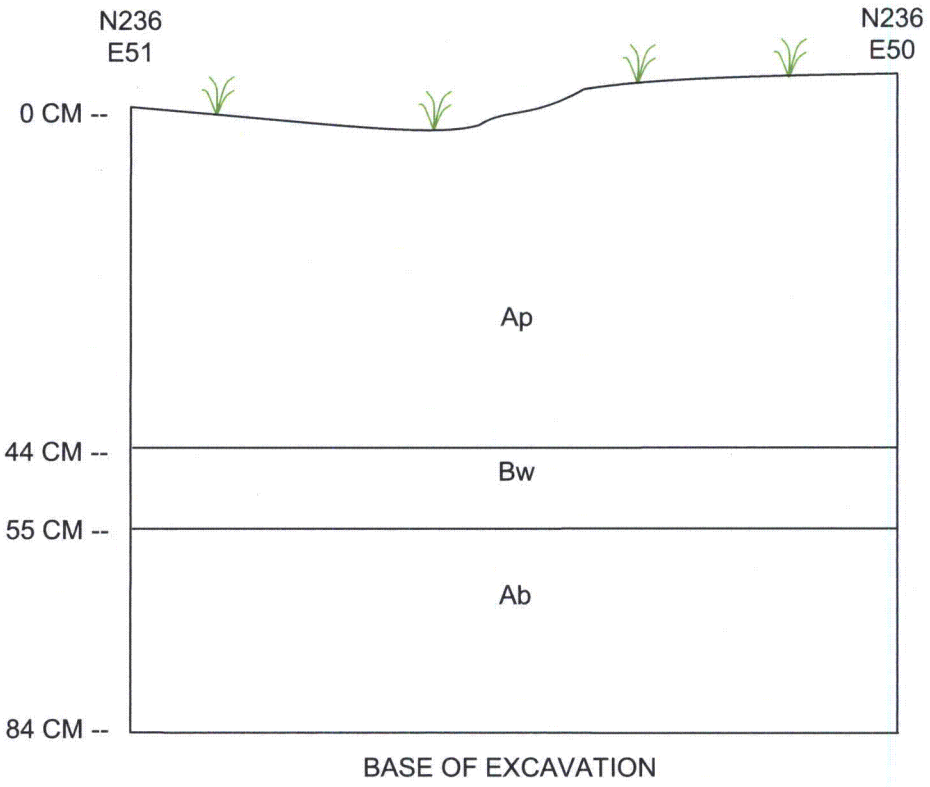
36LU288
TEST UNIT 10
SOUTH WALL PROFILE



Ap – BROWN (10YR 4/3) SILT LOAM
Bw – YELLOWISH BROWN (10YR 5/6) SANDY LOAM
Ab – DARK YELLOWISH BROWN (10YR 3/4) SANDY LOAM

LEGEND

– GROUND SURFACE

SCALE

0 CM 25 CM 50 CM

FIGURE 19-13.
SITE 36LU288: TEST UNIT 10
SOUTH WALL PROFILE

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UNISTAR NUCLEAR DEVELOPMENT, LLC.

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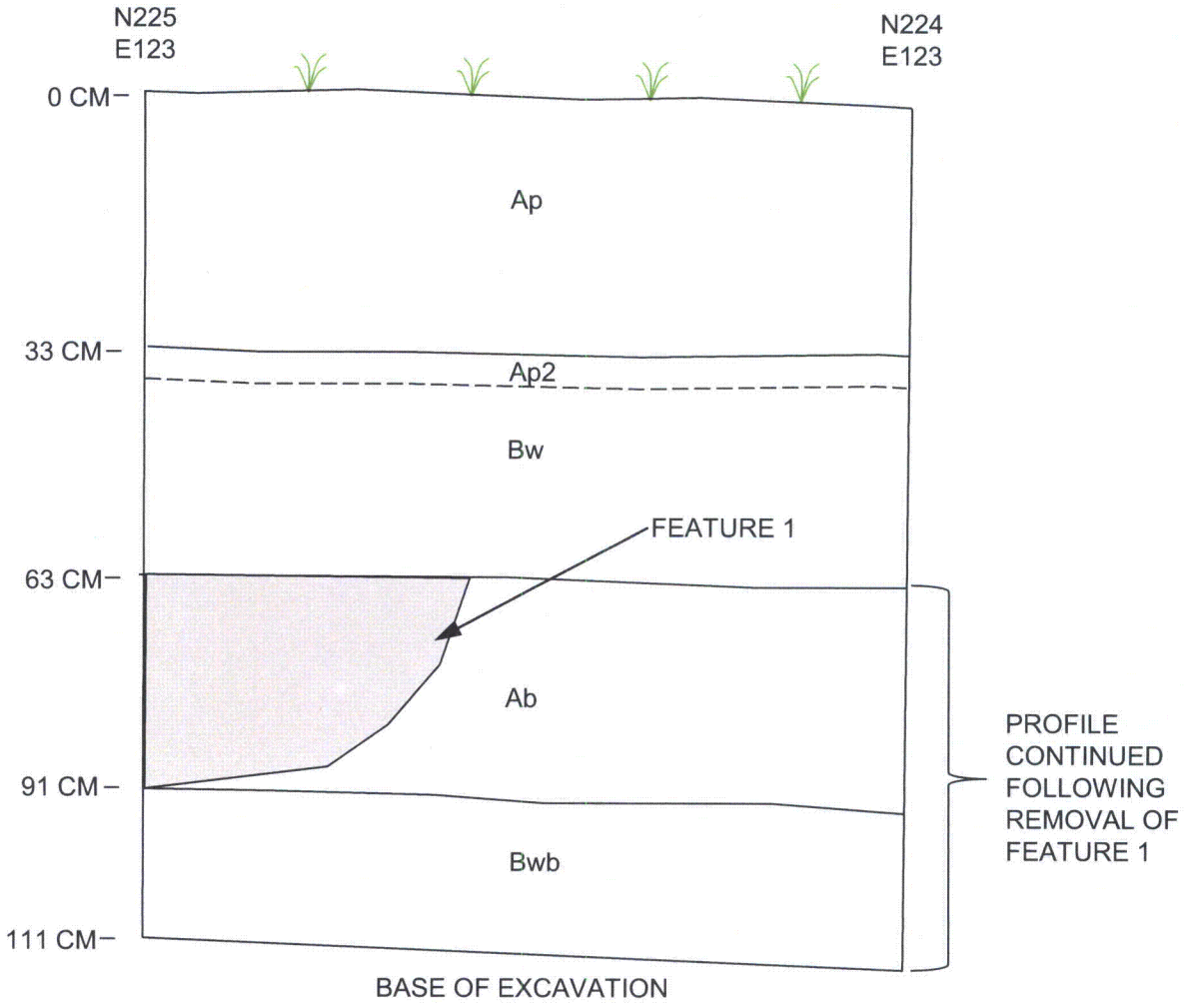
36LU288
TEST UNIT 14
EAST WALL PROFILE
SHOWING FEATURE 1



Ap – BROWN (10YR 4/2) SILT LOAM
Ap2 – BROWN (10YR 5/3) SILTY LOAM
Bw – YELLOWISH BROWN (10YR 5/6) SILT LOAM
Ab – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
FEATURE 1 – VERY DARK GRAYSIH BROWN (10YR 3/2) SILT LOAM WITH CHARCOAL FLECKING
Bwb – YELLOWISH BROWN (10YR 5/4) SILT LOAM

LEGEND

– GROUND SURFACE

– FEATURE FILL

SCALE

0 CM 25 CM 50 CM

FIGURE 19-14.
SITE 36LU288: TEST UNIT 14
EAST WALL PROFILE
SHOWING FEATURE 1

BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.
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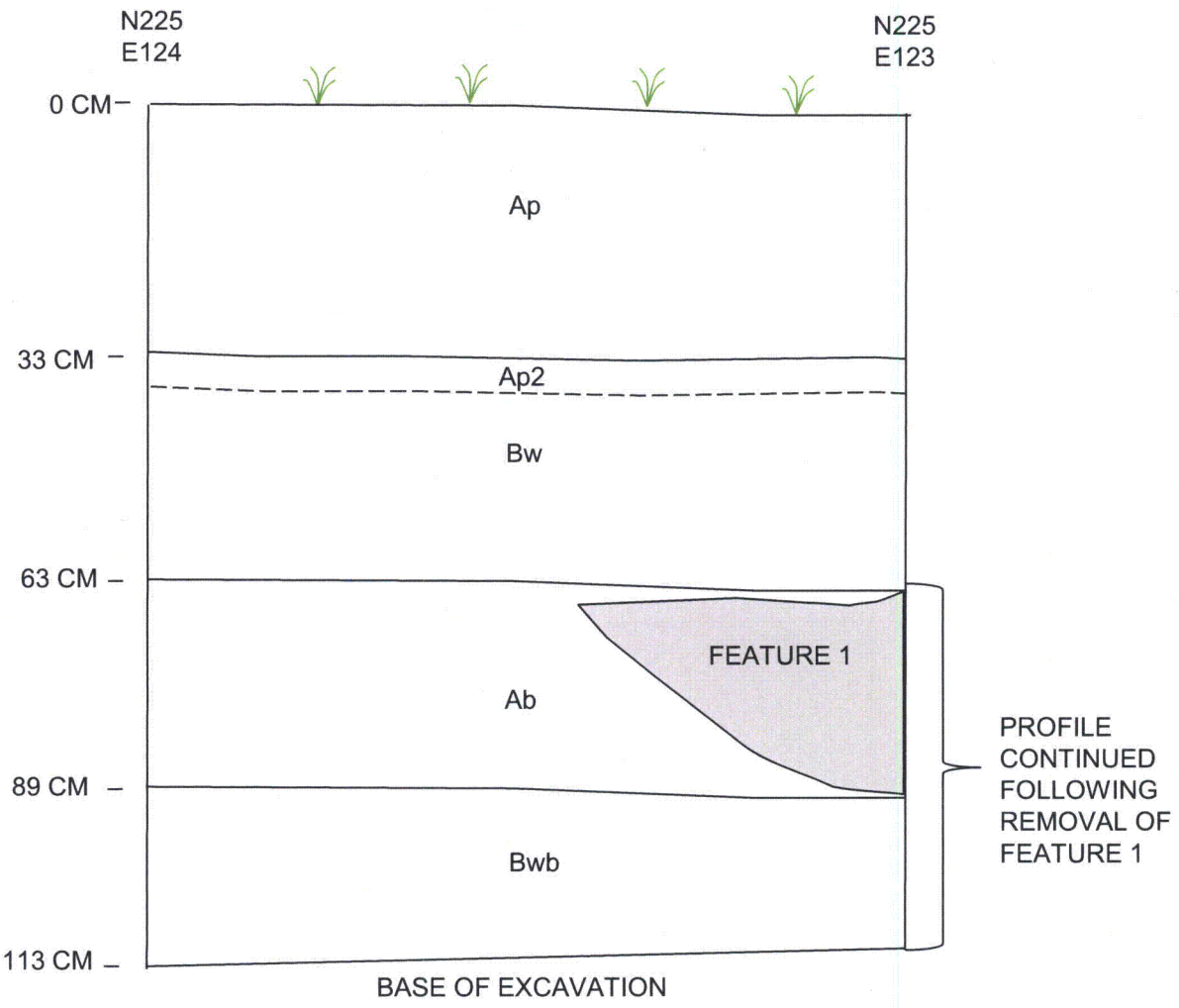
CHECKED: LMD APPROVED: BAM

36LU288
TEST UNIT 15
SOUTH WALL PROFILE
SHOWING FEATURE 1



Ap – BROWN (10YR 4/3) SILT LOAM
Ap2 – BROWN (10YR 5/3) SILT LOAM
Bw – YELLOWISH BROWN (10YR 5/6) SILT LOAM
Ab – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
FEATURE 1 – VERY DARK GRAYISH BROWN (10YR 3/2) SILT LOAM WITH CHARCOAL FLECKING
Bwb – YELLOWISH BROWN (10YR 5/4) SILT LOAM

LEGEND

– GROUND SURFACE

– FEATURE FILL

SCALE

0 CM 25 CM 50 CM

FIGURE 19-15.
SITE 36LU288: TEST UNIT 15
SOUTH WALL PROFILE
SHOWING FEATURE 1

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UNISTAR NUCLEAR DEVELOPMENT, LLC.

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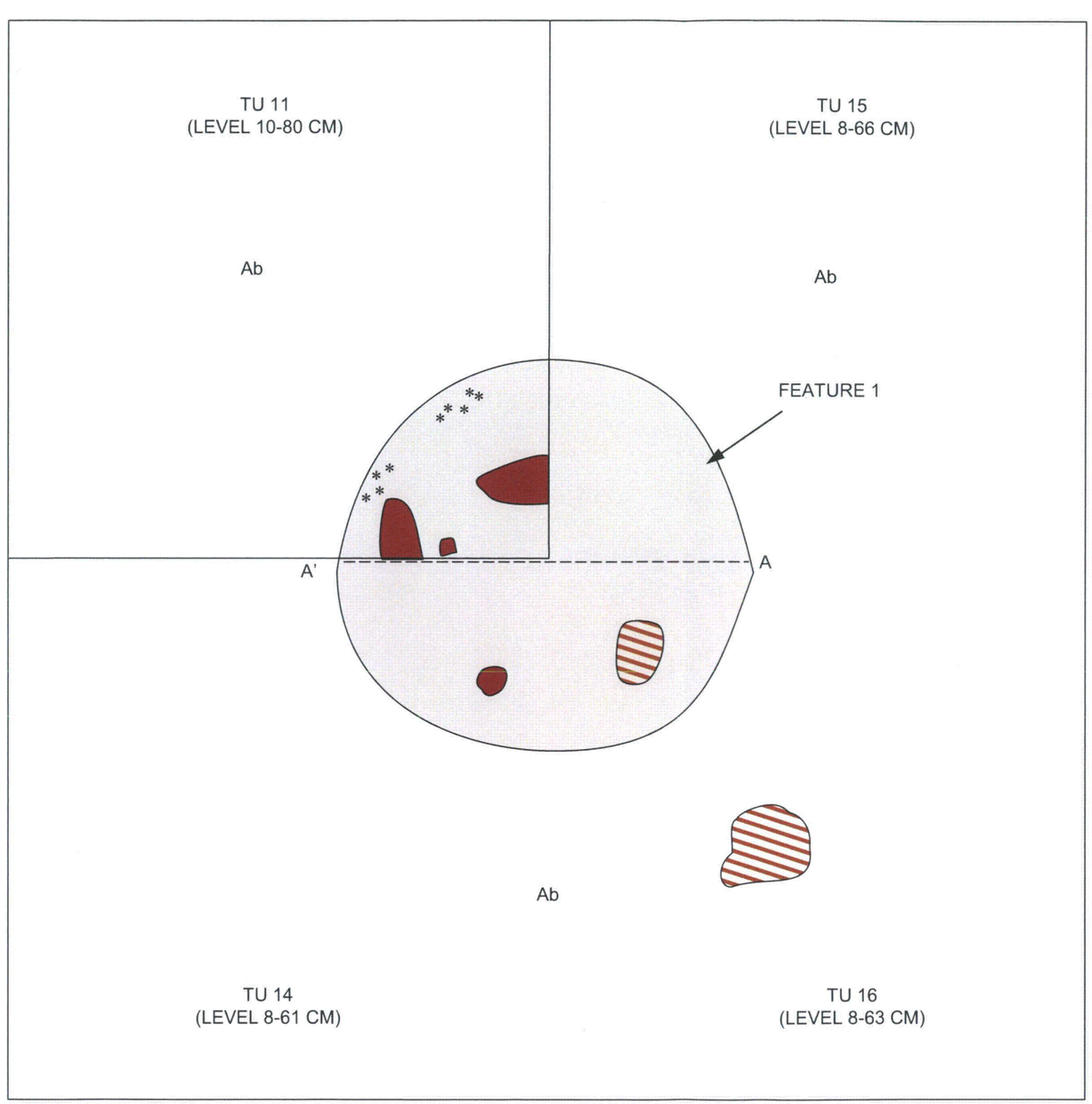
CHECKED: LMD APPROVED: BAM

SITE 36LU288
FEATURE 1 PLANVIEW
(TEST UNITS 11,14,15 AND 16)



LEGEND

: FIRE CRACKED ROCK

: BIOTURBATION

* : CHARCOAL

A – A' : BISECTION LINE

SCALE

0 CM 25 CM 50 CM

Ab – DARK YELLOWISH BROWN (10YR 4/4) SILT LOAM
FEATURE 1–VERY DARK GRAYISH BROWN (10YR 3/2) SILT LOAM WITH CHARCOAL FLECKING

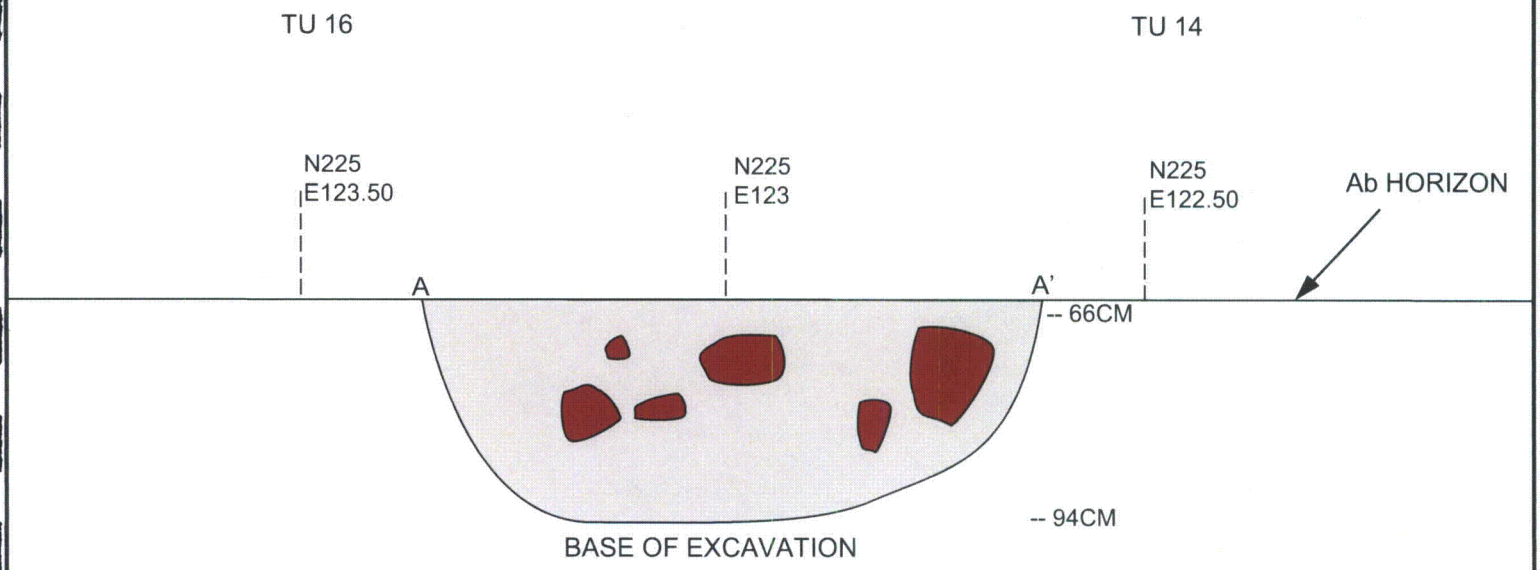
FIGURE 19-16.
SITE 36LU288: FEATURE 1 PLANVIEW

gai consultants

BELL BEND NUCLEAR POWER PLANT
UNISTAR NUCLEAR DEVELOPMENT, LLC.

DRAWN: SJS DATE: 5/3/10
CHECKED: LMD APPROVED: BAM

36LU288
FEATURE 1
SOUTH PROFILE



FEATURE 1 : VERY DARK GRAYISH BROWN (10YR3/2) SILT LOAM
Ab HORIZON: DARK YELLOWISH BROWN (10YR4/4) SILT LOAM

NOTE:
A – A': BISECTION LINE

LEGEND

:FIRE CRACKED ROCK

:FEATURE FILL

SCALE

0 CM 25 CM 50 CM

FIGURE 19-17.
SITE 36LU288: FEATURE 1
SOUTH PROFILE

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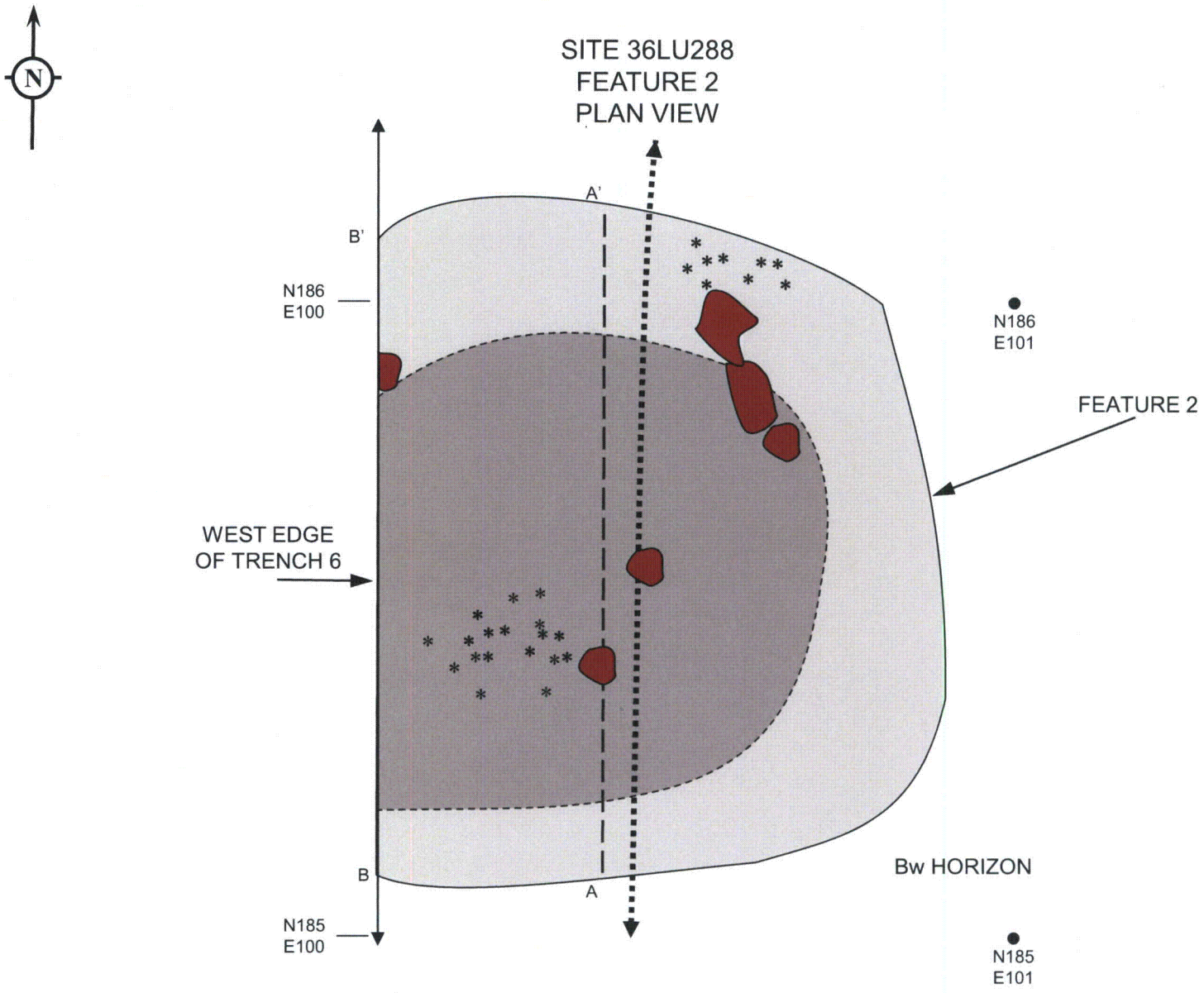

:FEATURE 2- VERY DARK BROWN (10YR2/2) SILT LOAM WITH CHARCOAL FLECKING

:FEATURE 2 – DARK BROWN (10YR3/3) MOTTLED WITH DARK YELLOWISH BROWN (10YR3/4) SILT LOAM

Bw HORIZON: DARK YELLOWISH BROWN 10YR3/4 SILT LOAM

NOTE:
A – A': BISECTION LINE (CENTER OF FEATURE)
B – B': BISECTION LINE (TRENCH 6 WALL)

LEGEND

:FIRE CRACKED ROCK

:PLOWSCAR

* :CHARCOAL FLECKING

------ :DIFFUSE BOUNDARY

SCALE

0 CM 25 CM 50 CM

FIGURE 19-18.
SITE 36LU288: FEATURE 2
PLAN VIEW

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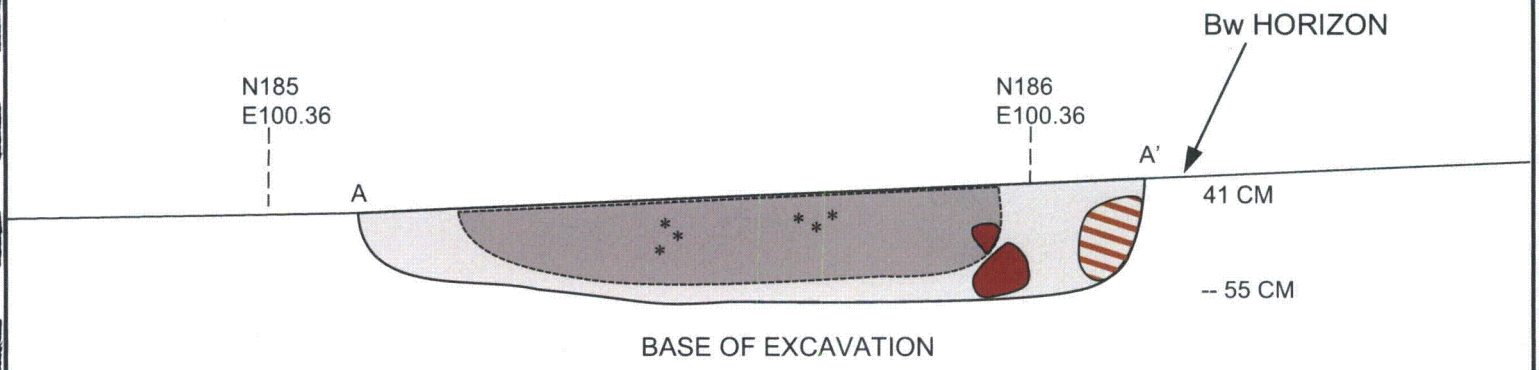
SITE 36LU288
FEATURE 2 WEST PROFILE



:FEATURE 2 - VERY DARK BROWN (10YR2/2) SILT LOAM

:FEATURE 2 – DARK BROWN (10YR 3/3) MOTTLED WITH DARK YELLOWISH BROWN (10YR3/4) SILT LOAM

Bw HORIZON : DARK YELLOWISH BROWN (10YR3/4) SILT LOAM

NOTE:
A – A': BISECTION LINE

LEGEND

------ : DIFFUSED BOUNDARY

*: CHARCOAL

: FIRE CRACK ROCK

: BIOTURBATION

SCALE

0 CM 25 CM 50 CM

FIGURE 19-19.
SITE 36LU288: FEATURE 2
WEST PROFILE

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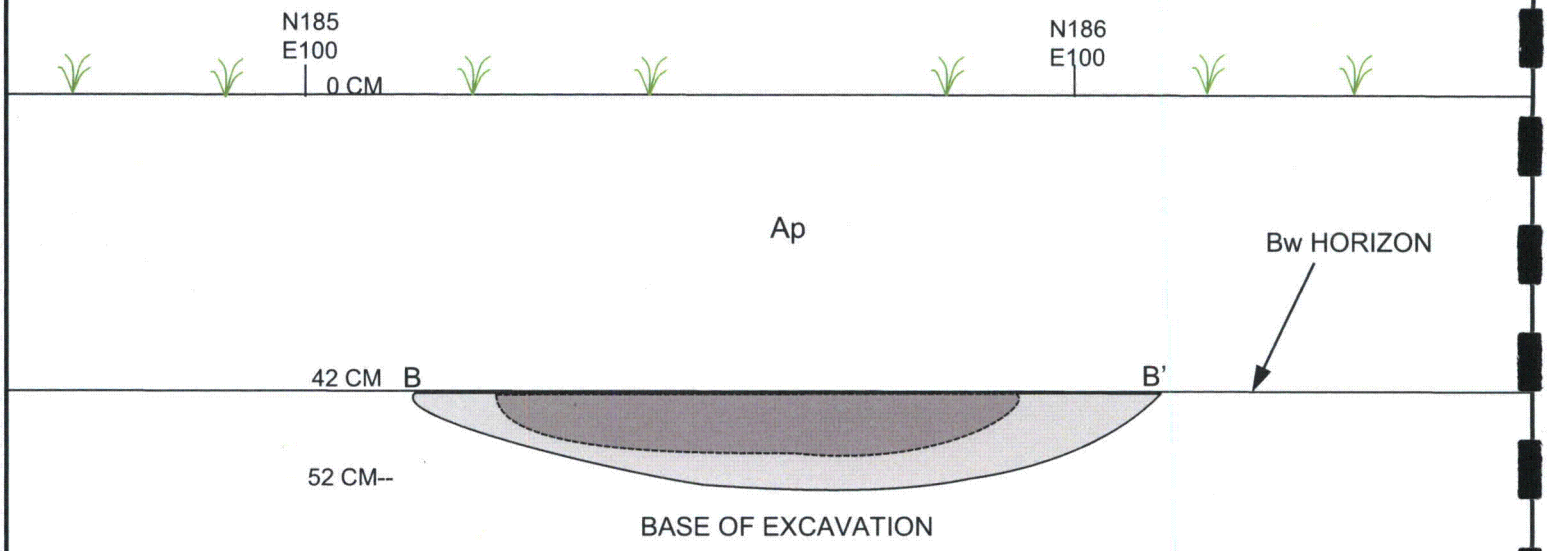
SITE 36LU288
FEATURE 2
WEST WALL IN TRENCH 6



Ap : DARK BROWN (10YR3/3) SILT LOAM

:FEATURE 2 - VERY DARK BROWN (10YR2/2) SILT LOAM

:FEATURE 2 –DARK YELLOWISH BROWN (10YR3/4) SITLY CLAY LOAM

NOTE:
B – B': BISECTION LINE

LEGEND

------ : DIFFUSED BOUNDARY

: GROUND SURFACE

SCALE

0 CM 25 CM 50 CM

FIGURE19-20.
SITE 36LU288: FEATURE 2
WEST WALL IN TRENCH 6

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UNISTAR NUCLEAR DEVELOPMENT, LLC.

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Figure 19-21. Site 36LU288: Distribution of Flaked Stone Tools
B Size

REDACTED Figure 19-21
Site 36Lu288: Distribution of
Flaked Stone Tools

(back of 19-21)

[*Side two of REDACTED Figure 19-21*]