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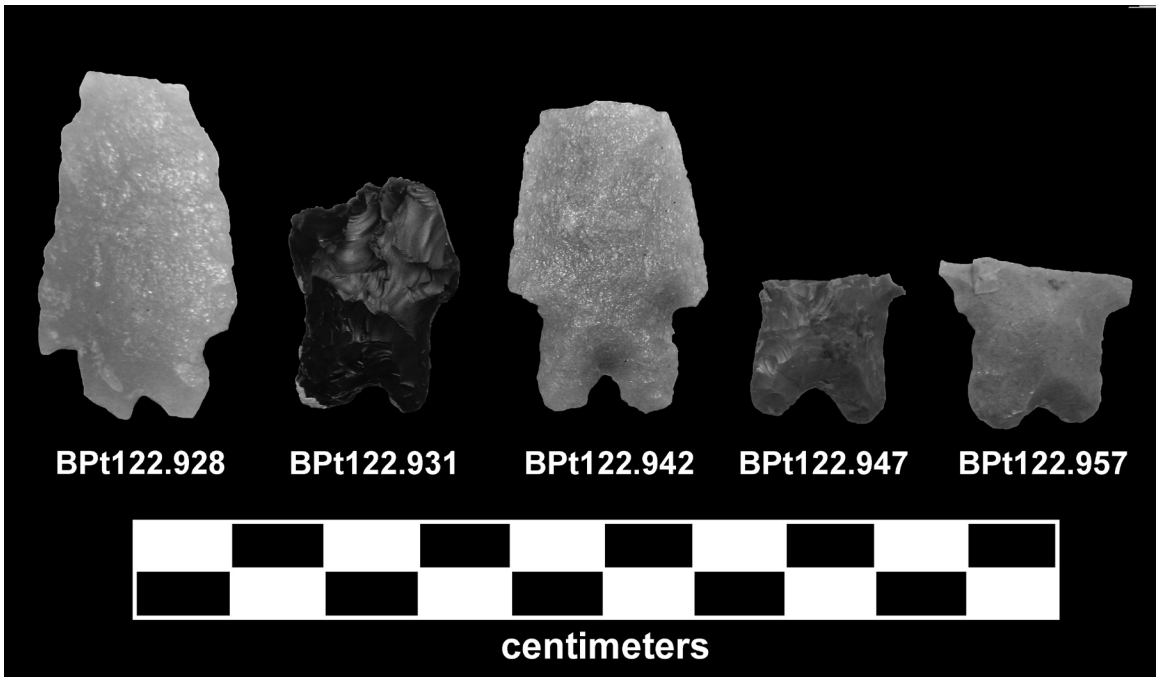

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On the Cover:

Projectile points from SW5815. See article by Heidi Humphreys this issue.

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ARCHAEOLOGICAL EXCAVATION AT SITE 48SW5815, SWEETWATER COUNTY, WYOMING

by
Heidi Humphreys

ABSTRACT

Data recovery excavations at archaeological site 48SW5815 were completed by Western Archaeological Services in the winter of 2012-2013. 48SW5815 yielded an assemblage of remains suggesting the site area was primarily a locus of repeated low intensity, short-term occupations by hunter-gatherer groups practicing a highly organized subsistence strategy using task specific activity areas which employed greater mobility within a broad spectrum collecting/foraging system. The excavation of the three blocks yielded 19 features, 3,339 pieces of FCR, 55 chipped stone tools (44 non-diagnostic tools and eleven projectile points), one groundstone fragment, 3,394 debitage specimens, and 1,446 faunal specimens, representing at least six cultural occupations spanning 2720 years of the Archaic period, including the transition period between the Opal and Pine Spring phases.

INTRODUCTION

Archaeological site 48SW5815 is located in the Green River Basin of southwest Wyoming (Figure 1). The Green River is west of the site, with the Blacks Fork River to the south. Prominent landforms in the general area include Whiskey Buttes and Blue Point. The site is located on the western flank of a small ridge extending southwest from a larger ridge, part of a string of erosion resistant landforms marking the western extent of the channel cut by the Green River. The smaller ridge descends 0.68 mi from an elevation of 6610 ft above sea level (ASL), slightly south and east of the site area, to an elevation of 6510 ft ASL. The site is located at an elevation 6544 ft ASL.

The excavations at 48SW5815 resulted in documentation of an Archaic-aged component consisting of multiple occupations. Four of the occupations date to the Opal phase of the Early Archaic period, and two are Late Archaic period occupations dating to the Pine Spring phase. The data recovery effort consisted of the excavation of three block areas centered on buried cultural materials identified during mechanical testing conducted by Western Archaeological Services in 2012 (Figure 2). Trench A block consisted of 23.5 1x1 m units over Trench A, Trench B block consisted of 30 1x1 m units over Trench B, and Trench C block consisted of 17 1x1 m units situated over Trench C.

Stratigraphic separation of cultural components at 48SW5815 was not readily observable during data recovery because soils in the site area are unbedded eolian deposits, and only extremely limited staining occurred outside of features, i.e., component staining was essentially non-existent. The six stratigraphic units identified during the geoarchaeological analysis of the site broadly correspond with radiocarbon ages by association of specific strata with dated features (Table 1). However, based on the results of radiocarbon dating and observations during the fieldwork phase, 48SW5815 represents a single Archaic-aged component consisting of multiple, mixed occupations.

The site is located on the eastern flank of

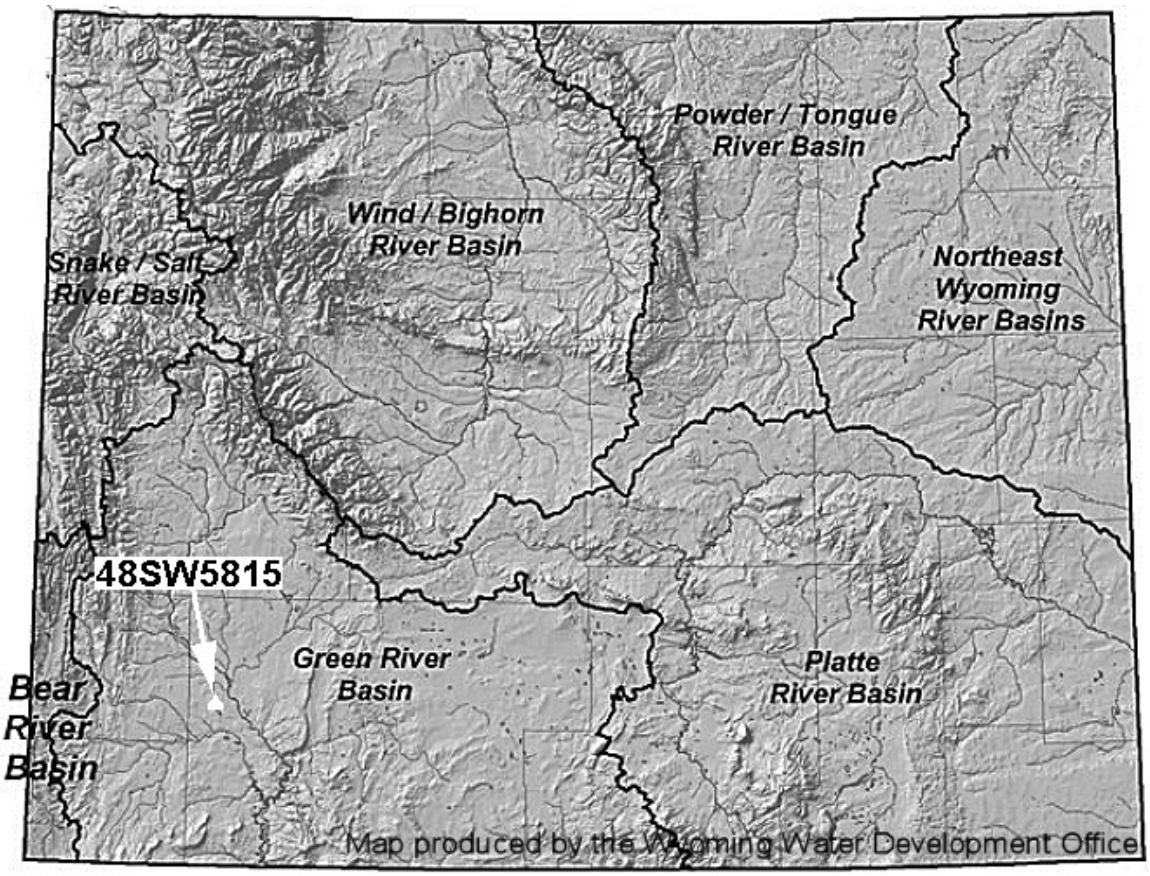

Figure 1: Shaded relief map of Wyoming showing major river basins and 48SW5815.

an internally drained playa basin. In a high desert environment, these natural water reserves provide a temporary water source resulting in an environmentally productive patch within an otherwise less hospitable landscape. The unique environmental setting of the site near the margin of a natural playa basin is an important factor which probably conditioned the repeated use of the area by local hunter/gatherer groups, and likely influenced resource procurement strategies on the basis of both seasonal rounds and resource selection.

Occupations at 48SW5815 date to the climatically transitory Late Middle Holocene and Early Late Holocene periods. Paleoclimatic research (Eckerle 2015) suggests general conditions in the Green River Basin were transitioning between the xeric Altithermal and more mesic, summer/wet conditions of the Neoglacial between 5200 and 1700 years B.P. While the overall trend suggests arid conditions similar to modern conditions, annual seasonal variability and the effects of localized microenvironmental factors (such as the playa) remains unknown. The high site density recorded in the area around Tailings Pond #3, and the broad span of documented radiocarbon dates from four previous data recovery projects at sites in the area, suggests the local landscape was intensely used throughout prehistory, and the playa was a primary factor informing the subsistence strategies of local inhabitants.

MATERIAL CULTURE

Excavations at 48SW5815 resulted in recovery of 19 features, 3,394 pieces of lithic debitage, 55 stone tools, 3,339 pieces of scattered, thermally-altered rock (FCR), and 1,446 faunal remains. Radiocarbon dates from nine features are the basis for defining six occupa-

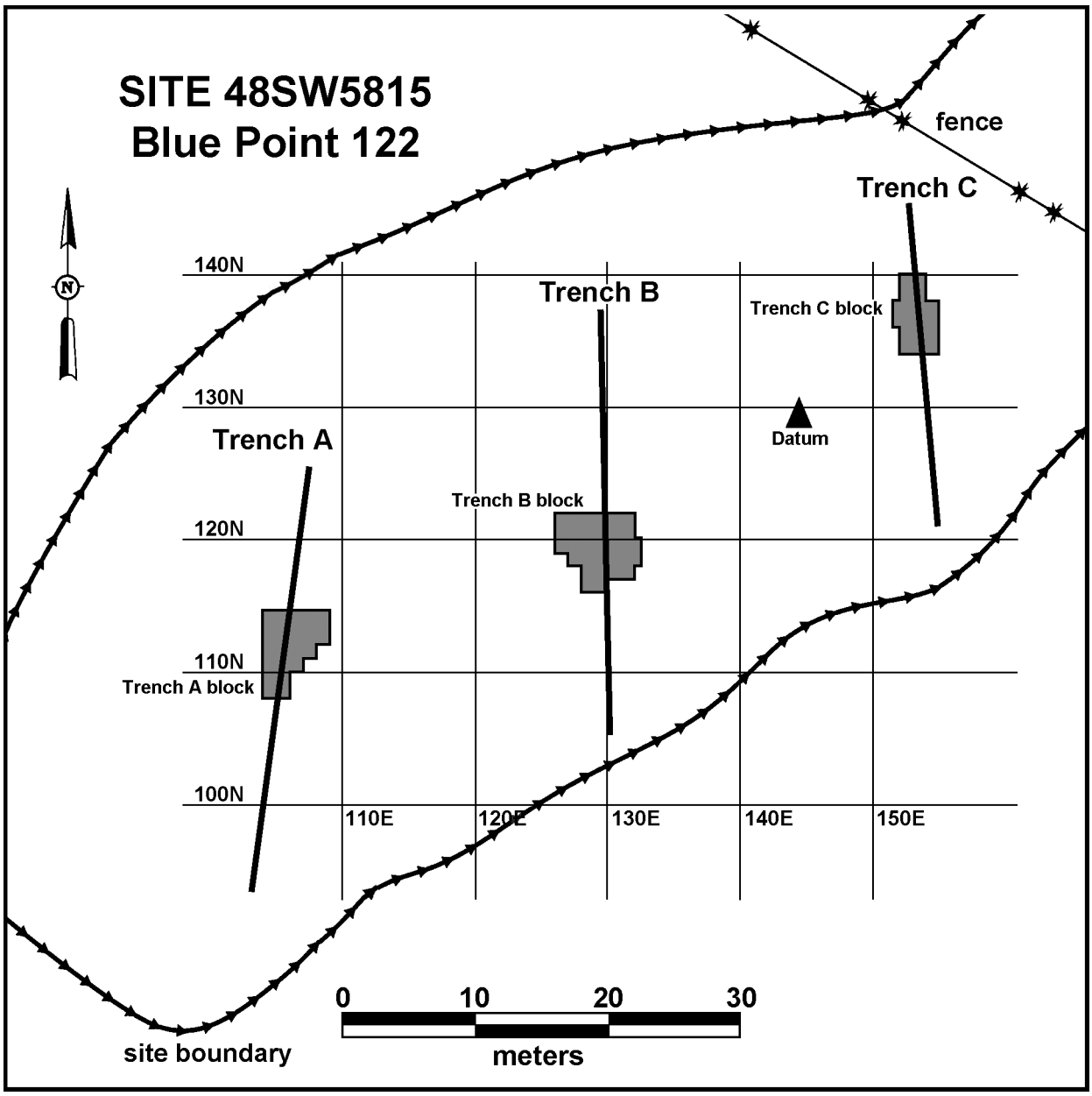

Figure 2: Sketch map of 48SW5815 showing test trenches and excavation blocks.

tions of the site during the Archaic period. The dated cultural occupations broadly correspond to stratigraphic units identified during geoarchaeological analysis at the site; however these were best discerned by chemical analysis, and were not readily observable in the field during excavation. As a result, only the dated features, and materials directly associated with the dated features (i.e., recovered from feature fill), could be related to distinct cultural occupations.

The assemblages of lithic debris, including stone tools, and faunal debris recovered outside dated features were not separable into direct relationships with the dated features because of the absence of observable component staining and vertical separation. Most of the lithic debris assemblage was recovered from outside of features (85.26%). Only 501 flakes (14.74%) were recovered from feature fill, of which 41 flakes (1.2% of the debitage) were associated

Table 1: 48SW5815 feature radiocarbon dates and associated cultural phase and soil strata.

EXCAVATION BLOCK STRATUM	OCCUPATION # PHASE	FEATURE	FEATURE TYPE CATALOG NUMBER	BETA SAMPLE NUMBER	CONVENTIONAL RADIOCARBON AGE BEFORE PRESENT (B.P)	2-SIGMA CALIBRATED AGE RANGE BEFORE PRESENT (B.P.)*	CALIBRATED CALENDRIC AGE
Trench C Block Stratum IIIa	5 Pine Spring	2	shallow basin BPt.122.28	343923[1]	3580± 30	3970-3940 3930-3830	2020-1990 BC
Trench C Block Stratum IIa	3 Opal	6	shallow basin BPt.122.3	343924[2]	4510± 30	5310-5040	3360-3090 BC
Trench C Block Stratum IIa	2 Opal	7	hearth clean-out BPt.122.4	343925[2]	5290± 30	6180-5990 5970-5950	4230-4040 BC 4020-4000 BC
Trench C Block Stratum IIIa	6 Pine Spring	9	shallow basin BPt.122.35	343926[1]	3110±30	3380-3320 3310-3260	1430-1370 BC 1360-1310 BC
Trench C Block Stratum IIa	1 Opal	11	shallow basin BPt.122.7	343927[2]	5830±30	6720-6700 6690-6680 6680-6600 6590-6560	4770-4750 BC 4740-4730 BC 4730-4650 BC 4640-4610 BC
Trench A Block Stratum IIa	1 Opal	12	deep basin BPt.122.26	343928[2]	5800±30	6670-6500	4720-4550 BC
Trench A Block Stratum IIa	1 Opal	14	deep basin BPt.122.27	343929[2]	5780± 30	6660-6490	4710-4540 BC
Trench B Block Stratum IIa	4 Opal	16	shallow basin BPt.122.25	343930[2]	4350± 30	5030-5020 4970-4850	3080-3070 BC 3020-2900 BC
Trench B Block Stratum IIIb	5 Pine Spring	17	shallow basin BPt.122.24	343931[2]	3590± 30	3980-3830	2030-1880 BC

1= organic sediment
2= charred material

with dated features. Faunal material was also recovered from both within features (n=488) and outside of features (n=958).

FEATURE TYPES

Nineteen features were identified at 48SW5815 (Figures 3-6). Based on largely on morphologic traits, three feature types were identified: basin hearths, hearth clean out/dump, and FCR midden (Table 1) with most being basin hearths. These include Features 2, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15a, 16, 17, and 18. These hearth features are typical of those found throughout southwestern Wyoming, consisting of well-defined charcoal staining roughly basin-shaped and hemispherical in profile. Features 16 and 17 were rock-filled, while the remaining basin hearths contained little to no FCR.

Features 7 and 15 were hearth clean-outs, distinguished from basin hearths by an oblong shape and shallow depth. Both features occurred in close horizontal association with another larger, basin hearth.

Features 1 and 3 were FCR middens. The excavations at 48SW5815 encountered extensive scattered FCR fragments, likely related to the ready availability of quartzite cobble in the area. The two midden areas were identified based on the density of the FCR debris, the absence of patterning or staining suggesting a deflated rock filled hearth, and the presence of unburnt faunal and lithic debris intermixed with the FCR.

Analysis of feature surface area to feature volume of the excavated features shows the features fall into the general size ranges of small (<15 liters), medium (15-30 liters), large (30-80 liters), and extra-large (>80 liters). The size break-down was arbitrarily determined based on data clustering. It is acknowledged truncation of the features by the trenches has probably affected both surface area and volume.

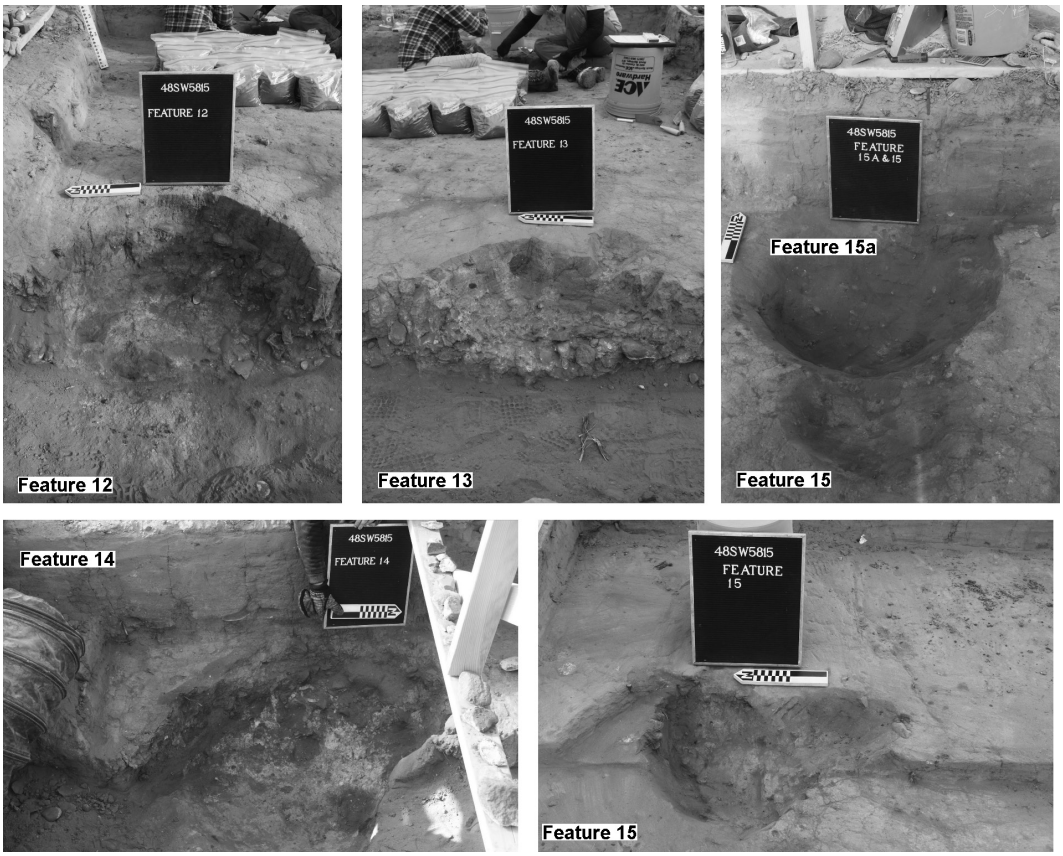

Figure 3: Features recovered from Trench A block.

Figure 4: Features recovered from Trench B block.

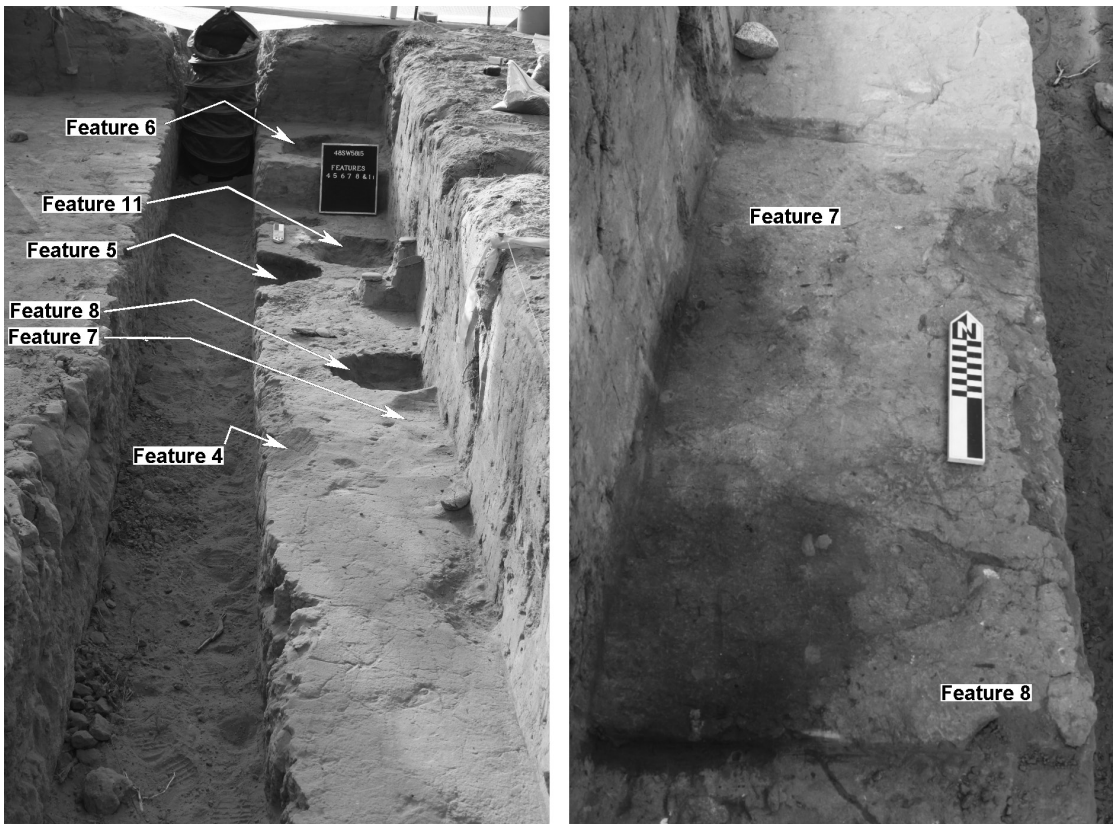

Figure 6: Features recovered from Trench C block.

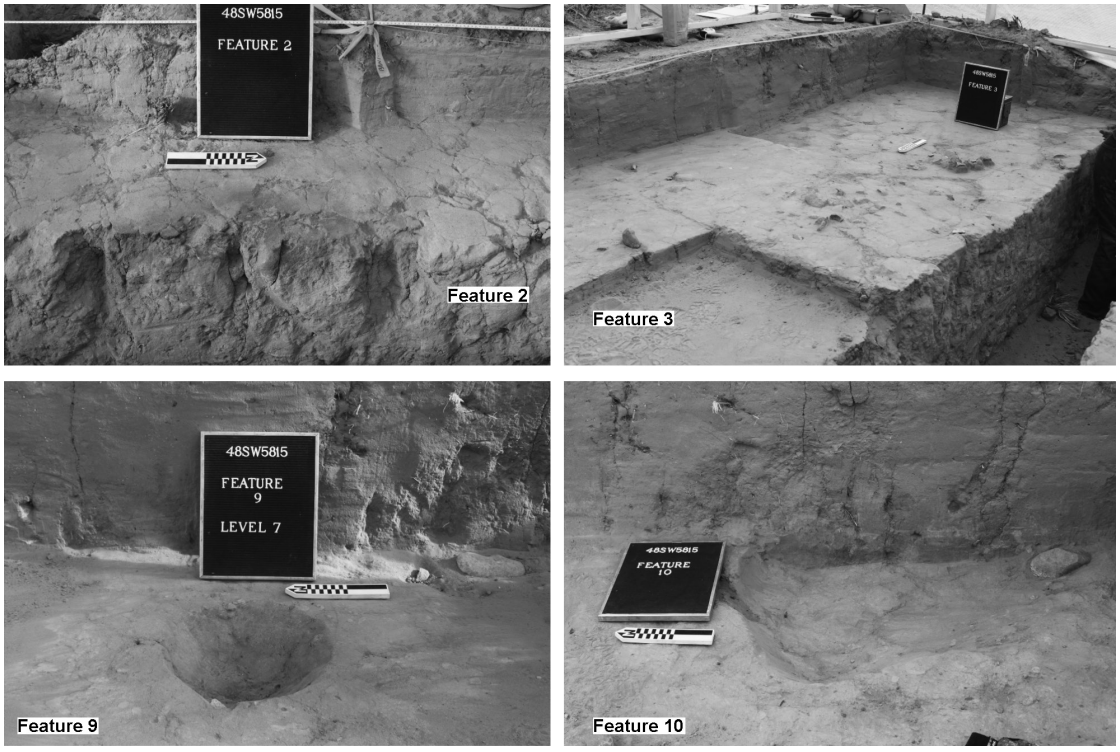

Figure 5: Features recovered from Trench C block.

However, since 72% of the features were cut by trenches, and all of the features were affected by erosion, this bias is relatively minimal. The average volume of features from 48SW5815 was 43.82 liters, however 63.1% of the features had a volume under 30 liters. Feature 7 was the smallest recovered feature with a volume of 5.63 liters, and Feature 14 was the largest with a volume of 251.33 liters.

Most of the features fall within the small (n=6) and medium range (n=6), including features truncated by the test trenches. Four features fall in the large range (Features 10, 12, 15a, and 16). Feature 12 was truncated by the test trench. The extra-large range includes three features (Features 1, 3, and 14), all of which were impacted by the test trenches.

Based on analysis of surface area to volume in this data set, this ratio is not necessarily an indicator of feature type. The basin hearths occurred in all four size ranges, and the hearth clean-outs occurred in both the small and large size ranges. Truncation by the test trenches also did not seem to skew the data because truncated features occurred in all four size ranges. The FCR midden features are natural outliers in the data set. Midden features, generally piles not formally constructed, would be expected to spread over the course of use, and probably have inflated dimensions as a result of erosional processes.

LITHIC RAW MATERIAL

Classification of the raw tool stone assemblage at 48SW5815 entailed use of three major categories based on the type of geological processes producing the original rock. These are chert, quartzite, and volcanogenic (obsidian). Each category is further divided into classes based on the formational environment which produced the raw material, such as algal colonies, ostracods, fossil soils, and other formation-specific parameters which can be detected by macroscopic examination of the artifact.

CHERT

Chert comprises 64.9% (n=2,204) of the debitage assemblage, and represents locally available materials from both primary and secondary deposits. Fossiliferous chert (69% of cherts) was more frequent than non-fossiliferous chert (31% of cherts) in the debris assemblage. Four classes of fossiliferous chert were identified including general fossiliferous chert (n=1118), Stromatolitic chert (n=316), Algalitic chert (n=2), and Whiskey Buttes chert (n=83). Five classes of non-fossiliferous chert were identified in the assemblage including general chert (n=291), Opaline chert (n=206), Alkali Creek chert (n=22), Moss Agate chert (n=164), and Granger Green chert (n=2) (Table 2).

Cherts comprise 61.8% of the chipped stone tool assemblage. Fossiliferous varieties account for 45% of the tool assemblage and include general fossiliferous chert (29%), stromatolitic chert (5.4%) and Whiskey Buttes chert (1.8%). Non-fossiliferous varieties account for 16.4% of the tool assemblage and include general chert (3.6%), opaline chert (5.4%), and Moss Agate (3.6%) (Table 2).

QUARTZITE

Quartzite comprises 33.5% (n=1138) of the debitage assemblage (Table 2). It is represented with slightly greater frequency in the flaked stone tool assemblage (36.4%), occurring through the range of chipped stone tools from cores and retouched flakes to final stage biface tools and projectile points (Table 2).

OBSIDIAN

Obsidian recovered from 48SW5815 included 58 flakes and one tested material. The obsidian debitage comprises 1.5% of the debitage and 1.8% of the tool assemblage (Table 2).

RAW MATERIAL DISCUSSION

Examination of the frequency of material types across the excavated site found chert materials occurred with greater frequency than quartzite and obsidian. Chert comprises 64.9% (n=2204) of the debitage assemblage and 60.7%

Table 2: Count of material types by excavation block at 48SW5815.

DEBITAGE MATERIAL	TRENCH A	TRENCH B	TRENCH C	TOTALS	% OF TOTAL
Chert - Fossiliferous	325	577	617	1519	44.8%
Chert - Non fossiliferous	411	90	184	685	20.2%
Quartzite	192	802	144	1138	33.5%
Obsidian	14	11	27	52	1.5%
Totals	942	1480	972	3394	100.00%

TOOL MATERIAL	TRENCH A	TRENCH B	TRENCH C	TOTALS	% OF TOTAL
Chert - Fossiliferous	5	10	10	25	44.6%
Chert - Non fossiliferous	5	1	3	9	16.1%
Quartzite	4	15	1	20	35.7%
Obsidian	1	0	0	1	1.8%
Sandstone[1]	1	0	0	1	1.8%
Totals	16	26[2]	14	56	100.00%

[1] tool is a groundstone fragment that is included in the total tool count
[2] total includes a projectile point found on the surface near Trench B block

(n=34) of the tool assemblage (Table D.1). Within the chert group, fossiliferous chert (69% of cherts in debitage; 73% of cherts in stone tools) was more frequent than non-fossiliferous chert (31% of cherts in debitage; 27% of cherts in stone tools) across the assemblage as a whole, including the stone tool assemblage.

Among the identified fossiliferous chert varieties, Stromatolitic chert was more frequent (n=334, 22%) than Whiskey Buttes chert (n=83, 5.5%), although an equal number of stone tools manufactured from each of these types was noted (n=2, both types). Among the identified non-fossiliferous chert varieties, opalines were more frequent (n=206, 30%) than Moss Agate (n=164, 24%). This was mirrored in the tool assemblage where four specimens were manufactured from opaline chert and two specimens manufactured from Moss Agate. However, the identification of types within the fossiliferous group is highly dependent on the ability of the technician examining the assemblage.

Quartzite comprises 33.5% (n=1138) of the debitage assemblage at 48SW5815, and accounts for a similar composition of the tool assemblage (n=20, 35.7%). Obsidian recovered included 52 flakes, and one tested pebble in the chipped stone tool assemblage. This accounts for 1.5% of the debitage assemblage, and 1.8% of the stone tool assemblage.

The overall composition of the debitage and stone tool assemblage suggests site inhabitants may have favored chert materials over quartzite and obsidian for manufacturing tools. However, examination of the debitage assemblages recovered from each excavation block suggests subtle trends which may relate to periods of occupation.

In Trench A block (Occupation 1) material frequencies suggest a selection for non-fossiliferous chert (43.6%) over fossiliferous varieties (34.5%), and quartzite (20.3%) (Figure 3). Occupation 1 dates to the Opal phase of the Early Archaic period (5380-5780 B.P.) In Trench B block (Occupation 4, 4350 B.P.; and Occupation 5, 3970 B.P.), the lithic debris was primarily manufactured from quartzite (54.2%), with 39% fossiliferous chert, and only 6.1% non-fossiliferous chert, a departure from the general trend. In Trench C block (dated Occupations 1, 2, 3, 5, and 6,) the primary material type was fossiliferous chert (63.4%) followed by non-fos-

siliferous chert (18.9%), and quartzite (14.7%) which reflects the debitage assemblage as a whole. Obsidian accounted for only 1.5% of the lithic assemblage at 48SW5815 (n=52), most of which was recovered from Trench C block (n=27). One tested pebble recovered from Trench A block represents the obsidian tools (1.8%). In general, the tool assemblage from each block mirrors the composition of raw materials in the corresponding debitage assemblage (Table 2).

The variation in occurrence of the material types across the site area over time suggests selection for certain materials dictated the casual procurement of locally available raw materials. Given a ready source of quartzite was likely available to site inhabitants throughout the 2,720 years of occupation, the nearly 2:1 distribution of chert over quartzite in the assemblage suggests either the quality of local quartzite material was unsuitable for tool manufacture, or it was looked upon not as a material for making tools, but for use as a heating element in hearths. The occurrence of obsidian is so small as to suggest it was either not highly favored or it was a rarely encountered exotic material.

Examination of the lithic raw material frequencies by block and soil stratum finds no discernable pattern to explain the greater frequency of quartzite in Trench B block, and no apparent pattern in the frequencies which could be linked to periods of occupation. It is unlikely erosional processes selectively accumulated any particular material in any particular area of the site; therefore, the variations in material frequency are likely from human behavior.

DEBITAGE

The lithic debitage recovered during excavations included 501 flakes recovered from feature fill. Of the flakes recovered (n=3,394), 942 flakes were from Trench A block, 1480 flakes were in Trench B block, and 972 flakes were in Trench C block. The variation in the occurrence of flakes across the excavation blocks is likely related to both natural and cultural variables, including erosion and intensity of lithic activity during the various occupations. While there is no way to isolate any particular variable acting on the assemblage, this discussion of the debitage assemblage highlights some of the interesting differences observed within the assemblage.

The debitage assemblage at 48SW5815 was classified based on individual flake attributes such as flake size, cortex, and platforms. Flake attributes can represent a progression in reduction and change as various tools are manufactured. Seven flake types are recognized within the Western Archaeological Services cataloging system: primary, secondary, tertiary, bifacial thinning (with and without cortex), finishing/maintenance (pressure flake), flake fragment with cortex, flake fragment without cortex, and shatter/chunks.

Specimens representing every stage of lithic reduction were identified in the debitage assemblage from 48SW5815 (Table 3). The debitage assemblage consisted primarily of tertiary flakes (36.2%, n=1228), followed by pressure flakes (26%, n=884) and secondary flakes (15.8%, n=536). The remaining assemblage included primary flakes (5.2%), bifacial thinning flakes (6.3%), flake fragments (<1%), and shatter (10.3%).

The examination of flake stages within the assemblage suggests site occupants were likely engaged in stages of lithic reduction falling in the middle of the reduction continuum. The frequency of tertiary flakes and pressure flakes suggests the initial reduction of materials for suitable blanks was not the primary reduction activity. Rather, suitable blanks were likely at hand, and further reduction of these items towards the production of usable tools was the primary reduction activity at the site. The production of flake tools, including retouched flakes, was also a focus of reduction activities at the site. Additionally, maintenance of existing tools, as evidenced by the frequency of pressure flakes, was also carried out in the site area.

Table 3: Count of flake stage by excavation block at 48SW5815.

FLAKE STAGE	TRENCH A	TRENCH B	TRENCH C	TOTAL	% OF TOTAL
Primary Flake	76	60	42	178	5.2%
Secondary Flake	162	209	165	536	15.8%
Tertiary Flake	234	654	340	1228	36.2%
Pressure Flake	352	323	209	884	26%
Shatter	74	146	129	349	10.3%
Fragment w/cortex	1	0	0	1	<1%
Fragment w/o cortex	1	0	0	1	<1%
Bifacial thinning w/cortex	4	1	0	5	<1%
Bifacial thinning w/o cortex	38	87	87	212	6.2%
Total	942	1480	972	3394	100.0%

As with the occurrence of material types across the excavation blocks, there are subtle variations in the occurrence of flake stages between each excavation block, possibly indicating relationships to periods of occupation. The general trend set by the assemblage is followed within each excavation block assemblage (Table 3). For example, it is the case within each excavation block where the combined population of tertiary flakes and pressure flakes represent essentially half of the assemblage within each excavation block, mirroring the assemblage as whole. Unlike the assemblage as a whole, the debitage in Trench A block is composed primarily of pressure flakes (37.4%). Interestingly, representation of tertiary flakes, the most frequently occurring flake stage within the assemblage, is lowest in Trench A block. Another interesting deviation from the assemblage as a whole seen in the Trench A block assemblage is primary flakes make up a higher percentage of the assemblage than in the site as whole (5.2%), and the percentage (8.1%) is twice as high as in either Trench B block (4.1%) or Trench C block (4.2%).

Size grades are applied to all flake types, primarily as a means of refining the technological classification. The size grades are determined by the length of the long axis of the specimen where 0 mm-6.9 mm = size grade 1, 7 mm – 14.9 mm = size grade 2, 15 mm – 29.9 mm = size grade 3, and specimens >30 mm are classified as size grade 4. As would be generally expected, the relationship of size grade to flake stage is close. It is expected debitage classified as pressure flakes would also be classified as a smaller size grade (size grade 1 or 2) and primary flakes or bifacial thinning flakes, when recovered 'whole' would fall into the larger size grades (size grade 3 or 4).

Of the debitage assemblage recovered from 48SW5815, flakes classified as size grade 2 were most frequent (n=1509, 44.5%) (Figure 7, Table 4). This is expected, given most of the debitage was also classified as tertiary flakes (n=1227, 36.2%).

Table 4: Count of debitage size grades by excavation block at 48SW5815.

SIZE GRADE	TRENCH A	TRENCH B	TRENCH C	TOTAL	% OF TOTAL
Size 1	294	276	209	779	22.9%
Size 2	388	710	411	1509	44.5%
Size 3	184	353	255	792	23.3%
Size 4	76	141	97	314	9.3%
Total	942	1480	972	3394	100.0%

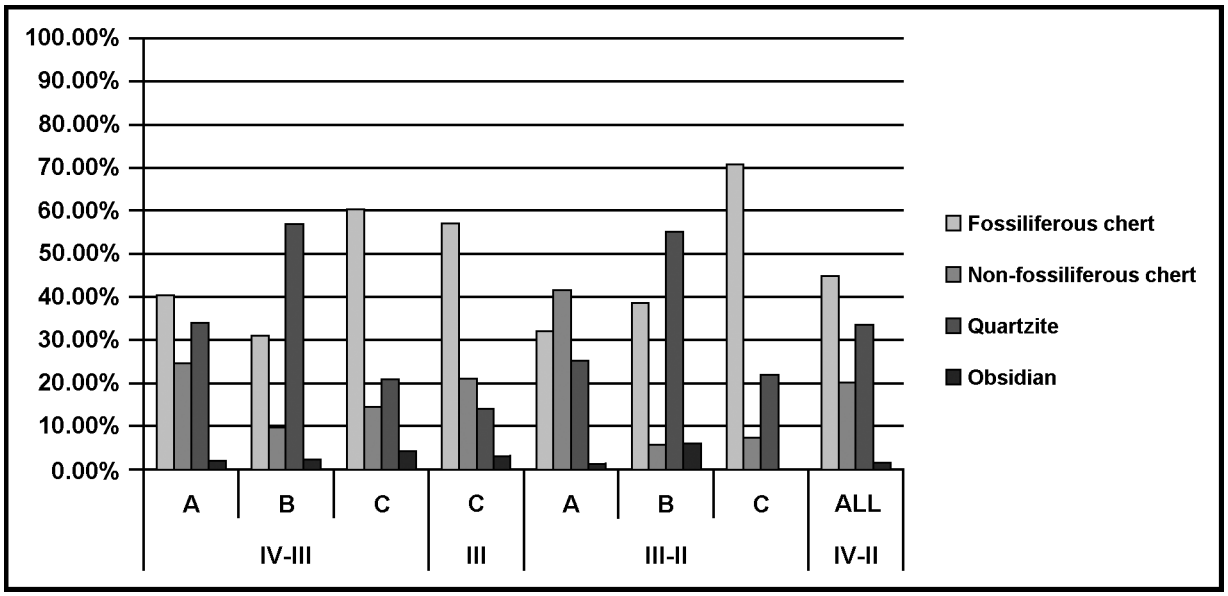

Figure 7: Bar graph showing distribution of raw material types by stratum and block at 4SW5815.

Debitage Discussion

Further investigation of the debitage assemblage included the cross tabulation of material type by flake stage, material type by size grade, and flake stage by size grade (Humphreys 2015). This exercise was applied to the debitage assemblage of the site as a whole and for each of the excavation blocks.

From this we see tertiary flakes (the most frequent flake stage across the assemblage) manufactured from quartzite occurred slightly more frequently (36.1%), within the assemblage than tertiary flakes manufactured from general fossiliferous chert (34.8%). And, within the debitage assemblage, flakes classified as size grade 2 and manufactured from general fossiliferous chert (36.2%) were slightly more frequent than those manufactured from quartzite (n=32%).

Within the debitage assemblage from Trench A block, pressure flakes manufactured from cherts (61.6%) occurred far more frequently than pressure flakes manufactured from quartzite (12%). In Trench B block and Trench C block, where tertiary flakes were most frequent, these were manufactured most often from quartzite (54.4%) in Trench B block, and from cherts (fossiliferous and non-fossiliferous= 88%) in Trench C block. In Trench C block, quartzite accounted for only 9% of tertiary flakes, a near reversal of the trend observed within the assemblage. While the distribution of material types, flake stages, and size grades, and cross-tabulations of these attributes suggest a cultural variable may be at play, it is impossible to determine whether human behaviors such as selection or preference evident in the debitage assemblage at 48SW5815 translate to a cultural practice which might be used to define a cultural period.

CHIPPED STONE TOOLS

Fifty-five stone tools (Table 5) were recovered, including eleven projectile point fragments. Because of the lack of vertical and horizontal separation between the features, it was difficult to assign specific tools to the various Archaic-aged occupations. Chipped stone tool fragments were recovered from Feature 1 (undated), Feature 9 (3110±30), Feature 10 (undated), and Feature 17 (3590±30). The remaining tools were located outside of features.

The chipped stone tools are presented in a format following the lithic reduction continuum based on the energy expended to produce the specific artifact. The main typology categories

Table 5: Distribution of stone tools across the excavation blocks at 48SW5815.

BLOCK	TESTED MATERIAL	CORE	UTILIZED FLAKE	RETOUCHED FLAKE	BLANK	PREFORM	FINAL*	TOTAL
Trench A	5	2	2	4	0	1	1	15
Trench B	4	4	1	4	0	1	10	24
Trench C	0	1	0	5	1	3	5	15
Surface	0	0	0	0	0	0	1	1
Total	9	7	3	13	1	5	17	55

are presented, although sub-categories indicating fragments or indeterminate artifacts were used at my discretion.

Basic metric measurements were taken on all chipped stone artifacts, including length, width, and thickness. Flake tools were orientated with the dorsal surface up. Descriptive observations included the condition of the artifact, the type of edge retouch, edge shape, and use-wear. A specific set of measurements were taken for the projectile points which included length, blade length, blade width, haft/neck width, base width, stem length, and thickness.

Because of the lack of vertical separation between the occupations it was difficult to assign the tools to any specific occupation of the site. The distribution of tools along the reduction continuum was fairly even including 28.5% tested material and cores, 28.5% retouched and utilized flakes, 7.1% blanks and preforms, and 35.7% final biface tools, including projectile points.

Tested Material

Nine tested cobbles were recovered from the excavation. Five cobbles (BPt122.906, BPt122.912, BPt122.913, BPt122.914, and BPt122.955) were recovered from Trench A block and four (BPt122.905, BPt122.927, BPt122.930, and BPt122.937) were recovered from Trench B block. No tested material was encountered in Trench C block. The tested material recovered from Trench A block includes unthinned nodules of quartzite (n=2), Stromatolitic chert (n=1), and obsidian with pebble cortex (n=1), with four to five flakes randomly removed. Specimens BPt122.906 and BPt122.914 appeared thermally altered. The four cobbles recovered from Trench B block included three quartzite cobbles and one crystalline quartz pebble, each with three to five flakes randomly removed. Specimen BPt122.905 appeared thermally altered.

Multidirectional Cores

Six multidirectional cores were recovered at 48SW5815. This includes two specimens from Trench A block (BPt122.919 and BPt122.922), three specimens from Trench B block (BPt122.926, BPt122.936, and BPt122.953), and one specimens from Trench C block (BPt122.945). The cores from Trench A block are both manufactured from quartzite with at least five flakes removed. Both specimens appear thermally altered. The cores from Trench B block include three quartzite specimens and one fossiliferous chert specimen. The fossiliferous chert core had about eight flakes removed and showed battering at both ends. Two quartzite specimens (BPt122.926 and BPt122.936) had four to ten flakes removed, and specimen BPt122.945 had no cortex remaining. All four cores from Trench B block appear thermally altered.

The core from Trench C block was manufactured from quartzite, and had more than seven flakes removed. It did not appear thermally altered.

Unidirectional Core

One unidirectional core was recovered in Trench B block (BPt122.936). The core is manufactured from quartzite and had at least

four flakes removed. The unidirectional core appeared thermally altered.

Utilized Flake

Utilized flakes are unmodified flakes with edges suitable for use without any further modification. These implements are considered expedient tools and must show clear evidence of use wear in the form of attrition. Since it is possible for flakes to obtain edge damage by other means, such as trampling, troweling, and transportation, a conservative approach was taken in this classification.

Three flakes were classified as utilized flakes. Two utilized flakes were recovered from Trench A block (BPt122.915 and BPt122.921) and one from Trench B block (BPt122.934). Two of the implements are made from fossiliferous chert (75%) and one from opaline chert (25%). The utilized flakes are all tertiary flakes ranging in thickness from 6.0 to 9.0 mm, with one utilized edge. General observations using a stereo microscope identified rounding, polishing, flaking, and edge crushing. The use wear patterns are suggestive of cutting and scraping activities.

RETOUCHED FLAKE

Thirteen retouched flakes were recovered from the site, including four specimens from Trench A block, four specimens from Trench B block, and five specimens from Trench C block. Based on morphological characteristics, two classes of retouched implements were identified: end scraper and graver.

End Scraper

Three end scrapers were recovered. These implements are made from percussion flakes and are generally teardrop shaped in outline. The distal end is crafted to form an arc-shaped working edge. Edge retouch is confined to the dorsal surface with edge retouch mainly along the distal end and partially along the lateral edges. Two specimens (BPt122.903 and BPt122.925) are complete and one specimen (BPt122.933) is a fragment. All three tools are manufactured from fossiliferous chert; Specimen BPt122.903 is manufactured from Stromatolitic chert. The steep edge angles along the lateral and distal end of each of these tools are consistent with edges most suitable for scraping tasks.

Graver

Two graver tools were recovered including one complete specimen (BPt122.911), and one graver fragment (BPt122.901), both from Trench C block. Any tool exhibiting a short, sturdy projection deemed suitable for scoring or perforating material can be described as a graver. BPt122.911 was manufactured from fossiliferous chert with a rectangular base diminishing to a narrow triangular point at the distal end. Narrow shoulders project slightly from the medial horizontal line of the tool. The ventral surface is unworked. Specimen BPt122.901 was also manufactured from fossiliferous chert and is likely the distal end of a graver, exhibiting retouch on the dorsal surface forming the end to a point.

BIFACIALLY THINNED TOOLS

Bifacial reduction of a flake or mass of raw material is employed to produce a variety of tools. Bifacial tool production is broken down into stages and end products recovered from the site.

Blank (Stage II)

One biface in the blank stage (II) was recovered from the excavation. BPt122. 952 is a complete specimen manufactured from Whiskey Buttes chert. The artifact measures 72 mm long, 54 mm wide, and 17 mm thick, with a roughly ovate shape. Reduction was focused along the lateral edges of the tool, and some cortex is visible near the lateral distal edge of the dorsal face. The artifact was recovered from Feature 10 in Trench C block, and appears to have been thermally altered.

Preforms (Stage III)

Four complete preforms were recovered from the excavation. Specimen BPt122.916 was recovered from Trench A block, and specimen BPt122.944, BPt122.949, and BPt122.951 were recovered from Trench C block. The preform

recovered in Trench A block was manufactured from opaline chert and was reduced to a roughly oval shape with no edge retouch. Specimen BPt122.944 and BPt122.951 were both manufactured from fossiliferous chert. Specimen BPt122.944 is roughly lanceolate in shape with no retouch. Specimen BPt122.951was recovered from Feature 9. The tool was manufactured from Whiskey Butte chert and is roughly acuminate in shape with some retouch at the distal end. Specimen BPt122.949 was manufactured from non-fossiliferous chert, and is ovate in shape with no bifacial retouch. The tool appears to have been the proximal medial portion of a larger preform reworked along what is now the distal edge of the tool.

Two preform fragments were also recovered from the excavation. Specimen BPt122.902 was recovered from Trench B block. It is the medial proximal portion of a fossiliferous chert preform rectangular in shape, with no bifacial retouch. Specimen BPt122.907 is the proximal portion of a biface preform also recovered from Trench B block. The tool was manufactured from fossiliferous chert displaying the crazing associated with thermal alteration. The fragment is too small to determine shape, and no bifacial retouch is evident.

Final Biface (Stage IV)

Five final bifaces were recovered from 48SW5815. Three specimens were recovered from Trench B block (BPt122.935, BPt122.939, and BPt122.954). Specimen BPt122.935 and BPt122.939 refit to form a complete final biface tool. It is manufactured from quartzite, is lanceolate in shape, and exhibits bifacial retouch along one lateral edge. Specimen BPt122.954 was also recovered from Trench B block. It is the medial distal fragment of a lanceolate shaped tool manufactured from quartzite. Bifacial retouch is evident along one lateral edge. Specimens BPt122.929 and BPt122.943 were recovered from Trench C block. Both artifacts appear to be pieces of projectile point bases with straight sides and convex bases. Specimen BPt122.929 was manufactured from general fossiliferous chert and specimen BPt122.943 was manufactured from general non-fossiliferous chert. Both artifacts display crazing and fracturing associated with thermal alteration.

PROJECTILE POINTS

Eleven projectile points were recovered from 48SW5815 (Figures 8-10). The projectile points included one complete projectile point, four projectile point fragments missing a portion of the tip and blade, four fragments consisting of the stem and base only, one fragment missing part of the blade, the stem and base, and one missing about half of the base. Most projectile points were recovered in Trench B block (63%). Two projectile point fragments were recovered from Trench C block (18%), and one reworked fragment was recovered in Trench A block (9%). One projectile point was identified on the surface during preparations to begin the excavation, and was located between Trench B block and Trench C block. The projectile points were divided into four subtypes, based on hafting attributes. Nearly half of the projectile points (n=5, 45%) recovered from the excavation are similar to specimens assigned to the Pinto series. These date from between 5000 - 3300 years B.P. (Heizer and Hester 1978) and fit within the range of dated features associated with the occupations at 48SW5815 (5830-3110 B.P.). One nearly complete projectile point fragment (BPt122.941), missing the tip, may represent an intrusive Late Prehistoric projectile point located in the southeast portion of Trench B block. Specimens BPt122.917 and BPt122.950 may represent Elko series points dating from 6000 – 3200 years B.P. (Aikens 1970).

Straight stemmed, basal notched specimens (n=5) were the most frequent projectile point type at 48SW5815, followed by corner notched specimens (n=3), and side notched (n=1). The remaining specimens are too fragmentary to classify (n=2). A variety of raw materials were represented in the projectile point assemblage including quartzite (n=5, 45%), fossiliferous

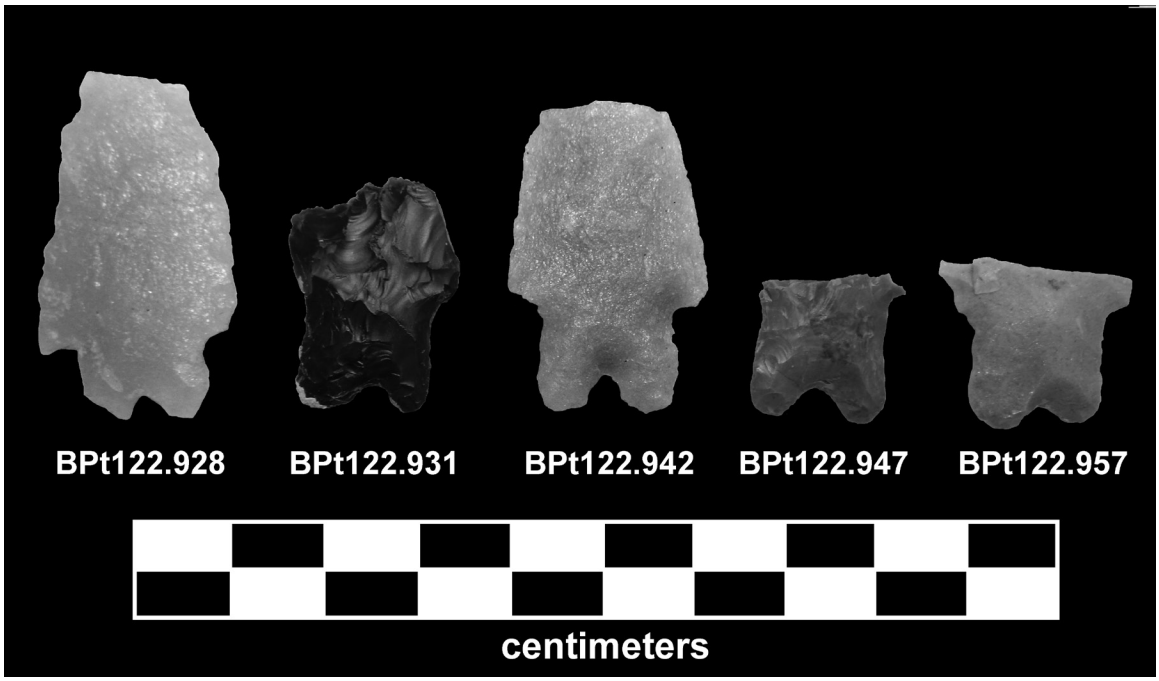

Figure 8: Type I projectile points from 48SW5815.

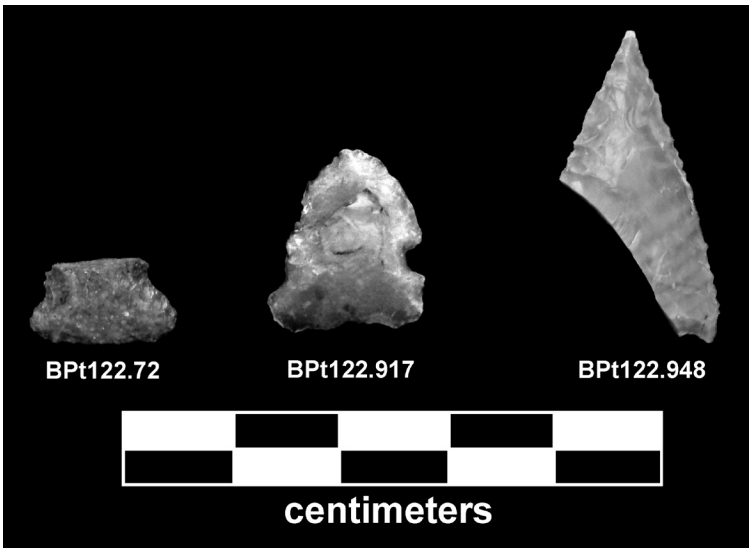

Figure 10: Type III-IV projectile points from 48SW5815.

chert (n=4, 36%), and general non-fossiliferous chert (n=2, 18%).

Type I: Straight stem with basal notch

Five Type I projectile points were recovered at 48SW5815, all of which were located in Trench B block (see Figure 8). Three of the five specimens were found in association with Feature 1 (BPt122.931, BPt122.947, and BPt122.957). Of the five Type I projectile points, two are proximal fragments missing the blade: BPt122.947 and BPt122.957. Specimen BPt122.928 is a medial proximal fragment ground on both lateral edges of the stem, and was not associated with Feature 1. The artifact is missing the tip, and a portion of the shoulder and base have also been snapped, probably as a result of use. Specimen BPt122.931 is a medial proximal fragment broken off at an impact frac-

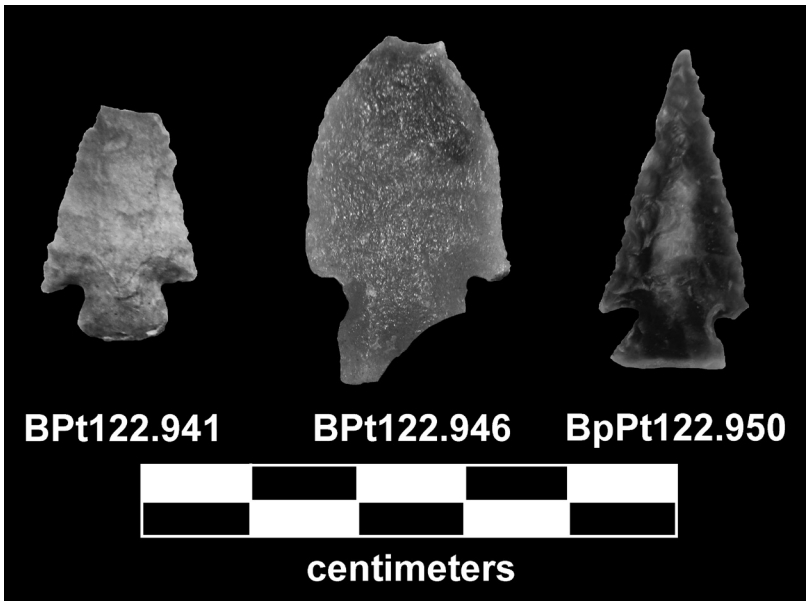

Figure 9: Type II projectile points from 48SW5815.

ture in the approximate middle of the blade. The distal end of the tool appears lightly reworked. Specimen BPt122.942 is a medial proximal fragment missing the tip as a result of impact fracture. Three specimens were manufactured from quartzite (BPt122.928, BPt122.942, and BPt122.957) (see Figure D.8), and two were manufactured from cherts (BPt122.931 and BPt122.947).

Type II: Corner notch

Three Type II projectile points were recovered from the excavation at 48SW5815 (see Figure 9); two from Trench B block (BPt122.941 and BPt122.946) and one from Trench C block (BPt122.950). Specimen BPt122.946 has a lanceolate shaped blade missing the tip, and was manufactured from quartzite. The notching is relatively shallow, and one tang is missing. The base is missing from just below one notch to the opposite proximal end of the base; therefore it is missing the elements used to characterize the stem and base. Specimen BPt122.941 and BPt122.950 have triangular shaped blades with straight to slightly convex sides. Notching is generally broad and deep. Specimen BPt122.950 manufactured from fossiliferous chert is complete and has an expanding stem with a straight base. Specimen BPt122.941is missing the tip at an impact fracture, and has a slightly expanding stem with a convex base. It was manufactured from quartzite. Both artifacts have fine, regular parallel bifacial retouch along the lateral edges of the blade, resulting in serration. This is more pronounced on Specimen BPt122.950 (Figure 9).

Type III: Side notch

One Type III projectile point was recovered from the Trench A block (Figure 10). Specimen BPt122.917 was manufactured from opaline chert and appears reworked along a lateral fracture extending from the tip to the shoulder. The remaining side notch is shallow and the base is slightly concave.

Type IV: Indeterminate

Two indeterminate projectile point fragments manufactured from fossiliferous chert were recovered from the excavation at 48SW5815 (Figure 10). Specimen BPt122.72 is a proximal fragment of a projectile point with an expanding stem and slightly convex base recovered from flotation analysis of Feature 17 (Trench B block). The artifact appeared thermally altered, therefore it is likely contemporaneous with Feature 17, which dates to 3590±30 years B.P., the Pine Spring phase of the Early Archaic period.

Specimen BPt122.948 is a medial lateral fragment of a projectile point with a triangular shaped blade recovered in Trench C block. A portion of one notch is evident, and suggests it was likely corner notched. It bears a longitudinal break from the apex of the extant notch to the opposite lateral edge. The break may have been caused by manufacturing error (Titmus and Woods 1986).

GROUNDSTONE

One groundstone fragment (BPt122.956) was recovered from the excavation at 48SW5815. The fragment was recovered from flotation analysis of Feature 15 (Trench A block). The fragment measures 53.2 mm in length, 33 mm in width, and 17.8 mm in thickness, with a highly polished area covering about 100 mm² on the ventral surface. The fragment is extremely friable, and too small to determine orientation or part.

FIRE-CRACKED ROCK

Fire-cracked rock (n=3,339) with a weight of 181.102 kg (399.3 lbs) was recovered during the excavations. All but one piece of the FCR was quartzite, which is expected given the abundance of quartzite cobbles near the site.

Most of the FCR was small fragments measuring less than 3.0 cm in diameter (47%), followed by fragments measuring 3-6 cm (36.4%) and large fragments measuring greater than 6.0 cm (16.5%). Trench B block contained the greatest amount of FCR (73.7%). Trench A block and Trench C block contained 10.9% and 15.3% of the recovered FCR, respectively (Table D.18). FCR midden features were identified in Trench B block and in Trench C block. In Trench B block, the FCR associated with Feature 1 accounted for about 19% of the weight of FCR recovered from the block. In Trench C block, Feature 3 contained 35% of the weight of FCR recovered from the block.

FAUNAL REMAINS

Most faunal material (Table 6) from the excavation was identified as cultural (Partlow 2014), i.e., specimens without carnivore modification or digestive corrosion indicative of non-human predator kill, and lacking skeletal completeness related to burrow death. Non-cultural fauna in the assemblage included 26 specimens identified to species including vole, pocket gopher, field mouse, and lizard, and 146 specimens identified to the small mammal size classes (Size Classes I, II, I-II, I-III).

As with the lithic materials, most of the faunal material recovered during excavation was located outside of features, making it difficult to assign the material to specific occupations. Faunal specimens (n=1,446) recovered from excavations included 488 specimens recovered from features (Table 6). Of the specimens identified in the features, more than half (61.9%) were large mammal remains assigned to size classes IV, V, VI, IV-V, IV-VI, or *Bison bison, Bos taurus/Bison bison*, or *Antilocapra americana*. Small mammals were also identified in features: 123 specimens were categorized as *Thomomys* sp, *Spermophilus* sp., *Microtus* sp., *Neotoma* sp., or size classes I, II, III, I-II, I-III. Of the assemblage, only 260 specimens (17.9%)

Table 6: Summary of faunal remains for 48SW5815.

FAUNAL SIZE CLASS	EXCAVATION BLOCK						TOTAL
	TRENCH A		TRENCH B		TRENCH C		
	IN FEATURE	OUT	IN FEATURE	OUT	IN FEATURE	OUT	
Large mammal	10	4	261	781	31	80	1167
Small mammal	63	1	6	26	57	30	183
Unknown*	16	2	32	34	12	0	96
	89	7	299	841	100	110	1446

were burnt (n=237 blackened, n=23 calcined), and four specimens were sun-bleached. The remaining specimens were unburnt.

INTERPRETATIONS

Because 48SW5815 contained multiple, superimposed occupations, patterning of material remains was obscured and negated meaningful analysis of spatial patterning in those remains. Taken as a whole, the cultural materials recovered from the 2012-2013 excavation of 48SW5815 reflect the types of materials ubiquitous across the archaeological landscape of southwestern Wyoming and are relatively unchanged through thousands of years.

48SW5815 has yielded an interesting assemblage of remains suggesting the site area was primarily a locus of repeated low intensity, short-term occupations which included tool maintenance activities and food preparation. The excavation of the three blocks yielded 19 features, 3,339 pieces of FCR, 55 chipped stone tools (44 non-diagnostic tools and eleven projectile points), one groundstone fragment, 3,394 debitage specimens, and 1,446 faunal specimens, representing at least six cultural occupations spanning 2720 years of prehistory.

The site was located in a Middle to Late Holocene aged eolian deposit lacking visible soil units, and no component staining was observed during the excavation. Most of the material remains recovered during the excavation at 48SW5815 was found outside of features. This makes separating the material remains into cultural phases troublesome. Chemical identification of stratigraphic units based on carbonate development was determined by geoarchaeological analysis. The correlation of these strata with excavation unit elevations and dated features was the basis for discussing material remains recovered from contexts outside of features as groups *likely* related to cultural phases. Under the circumstances, it is impossible to determine a cultural affiliation for any of the undated hearths or material remains from contexts outside of dated features at 48SW5815.

Opal phase occupations at 48SW5815 span 1320 years (5830 – 4510 B.P.), with Pine Spring phase occupations span 1240 years (4350±30-3110±30 B.P.). Based on these radiocarbon dates, manifestation of the Opal phase appeared in Trench A block and lower elevations in Trench C block. Trench A block contained 27.8% of the cultural materials and 26.3% of the features recovered during excavations.

The Pine Spring phase was manifested in Trench B block and upper elevations in Trench C block. Trench B block contained 43.7% of the recovered materials and 21% of features. Trench C block contained 28.7% of all the recovered cultural materials and represents both Opal phase and Pine Spring phase occupations. Trench C block contained most of the recovered features (52.6%).

Feature morphology was generally consistent across the six occupations, with 15 basin hearths recorded (five in Trench A, three in Trench B and seven in Trench C), two feature clean-out/dump areas (one of which dated to Occupation 2 in Trench C block), and two FCR midden features (one in Trench B and one in Trench C). Feature 16 and Feature 17, both recovered from Trench B block and both representing Pine Spring phase occupations, were rock filled. The remaining 13 basin hearths had only a few pieces or no FCR within the fill.

Given an assumed loss of volume to erosion over time, the overall small size of the features at 48SW5815 suggests the 13 basin hearths not rock filled may have functioned primarily as a source of light or ambient heat, and were employed by inhabitants for less complex food preparation such as roasting meat on skewers over open flame. Feature 16 and Feature 17 may have functioned primarily as baking hearths which needed to reach higher temperatures to achieve desired results than hearths over which meat was roasted. None of the features with direct or assumed relationship to the Opal phase were slab-lined hearths.

The chipped stone tool assemblage at 4SW5815 is relatively small, consisting primarily of retouched flakes (29%). Biface tools, including blanks (n=1), preforms (n=6), and final biface tools (n=5) account for 27% of the tool assemblage. The assemblage is rounded out by nine pieces of tested material, six cores, and three utilized flakes. The small representation of final biface tools (and the fragmentary condition of specimens identified as final biface tools) suggests this class of tools was transported to the site area for use, sharpened as needed, and discarded at the end of the specimen's useful life (including accidental or irreparable breakage). This is somewhat supported by the high frequency of pressure flakes in the debitage assemblage. The manufacture of complex tools for long term use was probably not the focal point of tool manufacture at 48SW5815. Instead, the relatively higher representation of retouched flakes in the tool assemblage and the high frequency of tertiary flakes in the debitage assemblage suggest production of tools for immediate or short term use with the intention to discard rather than rework them was the focus of tool production at the site.

None of the chipped stone tools was directly associated with any of the dated features, therefore it is impossible to assign any of specimens in the tool assemblage to any particular occupation or cultural phase.

Eleven projectile points (ten fragmentary) were recovered from 48SW5815, of which one indeterminate base fragment was associated with the Pine Spring phase because it was recovered from Feature 17 (3590±30 B.P.). In all, four projectile point types were identified in this assemblage: straight stem with basal notch, corner notch, side notch, and indeterminate.

Only one piece of groundstone manufactured from sandstone was recovered during the excavation at 48SW5815. The indeterminate, burnt, fragmentary piece of groundstone was associated with Feature 15 (not dated) which may relate to the Opal phase based on stratigraphic association with dated features in Trench A.

Debitage composition, including raw materials, flake stage, and size grade, was generally consistent across the excavation blocks. In both Trench A block and Trench C block, fossiliferous chert was more frequent than quartzite; however in Trench B block quartzite was far more frequent than chert materials. Other notable variations from general lithic material frequency trends include a drop in the frequency of opaline cherts and pebble obsidian in Trench B block which may correspond with the marked increase in quartzite. Moss Agate chert, a non-fossiliferous chert subtype, occurs with greater frequency in Trench A block than in both Trench B block and Trench C block combined. And while Stromatolitic chert has a relatively even frequency distribution between Trench C block and Trench B block, it has a much lower occurrence in Trench A block. Because the cultural materials recovered from the excavation could not be assigned to the dated occupations, the variation in material frequencies across the excavation blocks is not necessarily an indicator of cultural affiliation or behavioral patterns in the current data set. However it also cannot be explained as a simple result of erosion or site formation processes. There was undoubtedly selection for specific types of stone tool materials by certain groups or individuals whether for personal use or for trade; however archaeological evidence for such behavior at 48SW5815 is obscured by the mixed occupations.

Interior tertiary flakes occurred with the greatest frequency of all the flake stages in the lithic assemblage. This was mirrored in Trench B block and Trench C block however pressure flakes occurred with the greatest frequency in Trench A block. The greater frequency of interior flakes across the excavation blocks suggests previously reduced lithic raw materials were probably transported into the site area rather than locally procured and reduced from cores. The limited number of cores and tested cobbles recovered from the excavation further

supports this. Again, since physical separation of the cultural materials into discreet occupations was not possible, the variations in flake stage across the three excavation blocks may not indicate specialized activities, but is also not a simple result of erosional processes.

The faunal assemblage from 48SW5815 was primarily recovered from contexts outside features and composed of fragmentary remains. Within the assemblage, 80% of the specimens were identified as large mammal, including 195 specimens identified as likely bison (*Bison* sp. and *Bos/Bison*) or bison-sized (mammal class size VI), and 73 specimens identified as pronghorn or pronghorn-sized (mammal class size V). The remaining specimens in the category of large mammal were identified to combined size classes representing a range of possible species: size class IV-VI, coyote to bison sized (n=287), and V-VI, pronghorn to bison size (n=613).

In contrast, small mammal specimens account for only 12.6% of the faunal assemblage. This includes 43 specimens (23%) identified as rabbit-sized (mammal class size III), jackrabbit (n=10), and cottontail rabbit (n=1). Specimens identified as squirrel-size (mammal class size II), family *Sciuridae,* and *Spermophilus* sp., are represented by 30 specimens (16.4%), and mammal class size I (vole size), *Microtus* sp., *Tamias* sp., and *Thomomys* sp. accounts for 26.5% of the small mammal assemblage. The remaining small mammal specimens (34.4%) were assigned to combined size classes including mammal size class I-II (vole to squirrel-size, n=6) and mammal size class I-III (vole to rabbit-size, n=57). Nine specimens were identified as lizard remains. These were determined to be non-cultural based on carnivore modification and skeletal completeness.

Examining the ratio of large mammal remains to small mammal remains in the excavation blocks representing Opal phase occupations vs Pine Spring phase occupations follows previously documented patterns in the Wyoming Basin suggesting a transition toward pursuit of larger game animals into the Pine Spring phase. However, specimens identified as large mammal also appeared in contexts presumed to be associated with the Opal phase.

One interesting aspect of the specimens identified as large mammal is the composition of identified elements. Among the specimens identified as *Bison* or *Bos/Bison*, 25 elements associated with the head of the animal were identified while only five elements related to limbs were identified. Of the specimens identified to element in mammal size class VI (bison-sized) 100 specimens were associated with the head, six with limbs, and one with the torso.

Among the specimens identified as *Antilocapra* (n=7), most identified elements were associated with limbs (n=4) or torso (n=3). In specimens identified as deer/sheep/pronghorn and mammal size class V (pronghorn-size), 12 specimens were associated with the torso, eleven specimens were associated with limbs, and two specimens were associated with the head. Discussions of faunal food yield are beyond the scope of the current project, but have been addressed elsewhere (Byers 2002; Hill Jr. 2007; Darlington et al. 2004). The abundance of cranial elements in the identified bison assemblage vs elements more likely to have greater subsistence value (limbs, torso) as seen in the assemblage of pronghorn and pronghorn sized specimens, could imply pronghorn was a more commonly pursued or encountered prey than bison.

Bearing in mind poor preservation is an important factor in the interpretation of site assemblages, it is interesting only one fragment of groundstone was recovered from the site. Since stone generally preserves quite well in archaeological sites, the near absence of groundstone implements and the absence of macrofloral remains in the feature fill, implies it is unlikely the site was a locus of plant processing activities. This does not necessarily imply the rank of floral resources was lower than of faunal resources during this time span. The playa

undoubtedly would have supported an abundant and diverse range of plant populations, particularly during 'wet' years. The absence of the kinds of material remains indicating plant processing at 48SW5815 may suggest plant processing activities occurred at other, specialized activity camps.

CONCLUSION

Site 48SW5815 may be a task oriented site representing one facet of a highly organized subsistence strategy using task specific activity areas which employed greater mobility within a broad spectrum collecting/foraging system. Occupations at 48SW5815 date to the climatically transitory Late Middle Holocene and Early Late Holocene periods. Paleoclimatic research suggests general conditions in the Green River Basin were transitioning between the xeric Altithermal and more mesic, summer/wet conditions of the Neoglacial between 5200 and 1700 years B.P. (calibrated radiocarbon dates). While the overall trend suggests arid conditions similar to modern conditions, annual seasonal variability and the effects of localized microenvironmental factors (such as the playa), remains unknown. 48SW5815 may primarily have been a locus of short-term retooling and processing camps with sporadic use for longer-term residential camps, perhaps during periods of favorable climatic conditions.

ACKNOWLEDGEMENTS

In the winter of 2012-2013, Western Archaeological Services (WAS) conducted data recovery excavations at 48SW5815 pursuant to cultural resource requirements stipulated by the Wyoming Bureau of Land Management (BLM) for the FMC Granger Tailings Pond #3 Expansion Project. Thanks to both BLM and FMC for their support during excavations and completion of this project. This article is extracted from the final report to the BLM (Humphreys 2015).

Faunal remains recovered from excavation at 48SW5815 were analyzed by Megan Partlow (2014). The author would also like to acknowledge the help of all others who assisted during the excavations at SW5815 and the associated laboratory analyses.

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Rock Springs, Wyoming

DATA RECOVERY AT SITE 48SH1740 ASSOCIATED WITH LITTLE HORN RIVER WATERSHED AMP CLASS III CULTURAL INVENTORY ON THE BIGHORN NATIONAL FORESTS MEDICINE WHEEL AND TONGUE RANGER DISTRICTS

by
Bill Matthews

The prehistoric component of the Boyd Cow Camp Archaeological Site (48SH1740) was first identified during an archaeological survey conducted by ACR Consultants, Inc. on September 13, 2009 as part of a forest-wide Grazing and Vegetation Management Analysis. The site was revisited by Terra Alta Archaeology on July 27, 2010. The prehistoric component was evaluated as being eligible for listing in the National Register of Historic Places under Criterion D while the historic component was evaluated as being not eligible for National Register listing.

Bighorn National Forest Archaeologists Bill Matthews, along with seven Passport in Time volunteers, conducted data recovery at the Boyd Cow Camp Site (48SH1740) in Sheridan County, Wyoming over a ten day period from July 24, 2011 to August 2, 2011.

SHPO concurred with the recommendations on February 25, 2011. Both contractors and the Forest Service were in agreement the site has been and is being adversely affected by erosion, grazing and construction activities.

To fulfill data recovery obligations agreed upon between the Forest Service and the Wyoming State Historic Preservation Office (SHPO), a data recovery project was instigated and used different levels of investigation to meet the general theoretical objectives of site integrity and chronology. The first level consisted of recovery of environmental and archaeological data. Recovery of evidence of all former occupants' material culture along with any cultural features was a key part of the data recovery focus. This project was implemented to evaluate possible impacts to subsurface cultural horizons, if there were in fact any present. Available data concerning temporal aspects of the site were also collected.

The historic component of the site was built by the Boyd family in 1938. The associated cow camp area has been impacted by livestock and vehicle traffic since its establishment 76 years ago, but no records of any improvements or additions to the associated structures since the original construction can be documented. Currently the Boyd Cow Camp oversees a grazing allotment of 7,391 acres supporting 200 head of cattle which graze the area seasonally for three months of the year. The project area is located within the Medicine Wheel Ranger District of the Bighorn National Forest in Big Horn County, Wyoming. More specifically, the Boyd Cow Camp Site is located on the east end of Boyd Ridge of the northwest portion of the forest.

ENVIRONMENTAL CONTEXT

TOPOGRAPHY

The Bighorn Mountains (aka, The Bighorns) are located in north-central Wyoming, extending from just south of the Pryor Mountains in southern Montana southeast, south, and west to finally merge with the Absaroka Mountains in western Wyoming. The Bighorns are about 120 miles (190 km) in length by 30 miles (50km) in width and form a pronounced barrier between the Powder River Basin to the east and the Big Horn Basin to the west. The Bighorn River Canyon separates the Bighorn Mountains from the Pryor Mountains. The portion of the Bighorns in central Wyoming curving west are often considered several separate mountain ranges called the Bridger Mountains and the Owl Creek Mountains.

ENVIRONMENTAL SETTING

As noted above, the Boyd Cow Camp lies on a northeast-southwest oriented ridge overlooking the Little Bighorn River to the east and Mann Creek to the west. The associated soil is the Cloud Peak-Starley-Rock series and is extensive through the northern part of the forest. This series is moderately deep, well drained and formed in residuum or colluvium derived from mountainside limestone. The surface soil is typically a gravely silt loam. The vegetation community associated with this area is Engelmann spruce, subalpine fir and Douglas fir. Ground vegetation runs through Idaho fescue to various sedges. Elevation ranges from 4,600 feet to 10,500 feet and annual precipitation varies from 12 to 38 inches.

SITE CONDITION

The Boyd Cow Camp was constructed in 1938 and since has had years of vehicle traffic, stock usage, and, more recently, All-Terrain-Vehicle (ATV) use. FS Trail #96 starts on the site and continues northeast down the ridge and eventually terminates at the Little Bighorn River. The existing structures on the site include a 30'x18' log cabin with a flagstone and granite cobble foundation, and a 26'x20' log tack shed/barn with a granite and sandstone foundation. Directly associated with this latter structure is a post and pole corral measuring roughly 25

feet in diameter (see **48SH1740** site map). Also associated with the site is a developed spring-head and water tank located behind the cabin to the west, and a 4'x4' outhouse with a poured concrete foundation. There is noticeable road rutting and stock trailing on site.

DATA RECOVERY METHODOLOGY

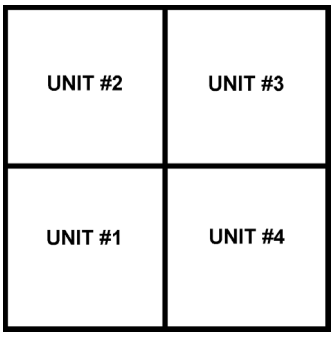
Standard recording and recovery methods were employed throughout, including:

- A grid system was established across the site area.
- As the project was undertaken, all identified surface-visible formal tools were marked with pin flags, plotted on the site map, GPS-located and described individually.
- Floral species were identified on-site.
- Three 2-by-2-meter-square excavation blocks (Blocks #1, #2, and #3) were excavated by hand. Each block was subsequently broken down into individual meter units (Units #1, #2, #3, and #4) and excavated by 10cm levels.
- Mapping of in situ artifacts and features during excavation.
- Dating any established subsurface components by chronometric means, if possible.
- To recover and analyze lithic artifacts by classification into artifact categories, including formal tool, expedient tool, utilized flake and primary, secondary and tertiary flakes.

DATA RECOVERY

The excavations units **(48SH1740 Site Map)** were spread roughly over a 50 meter area. Block #1 is the most southeast unit and is about 20 meters southeast of Block #2 and roughly 50 meters east of Block #3.

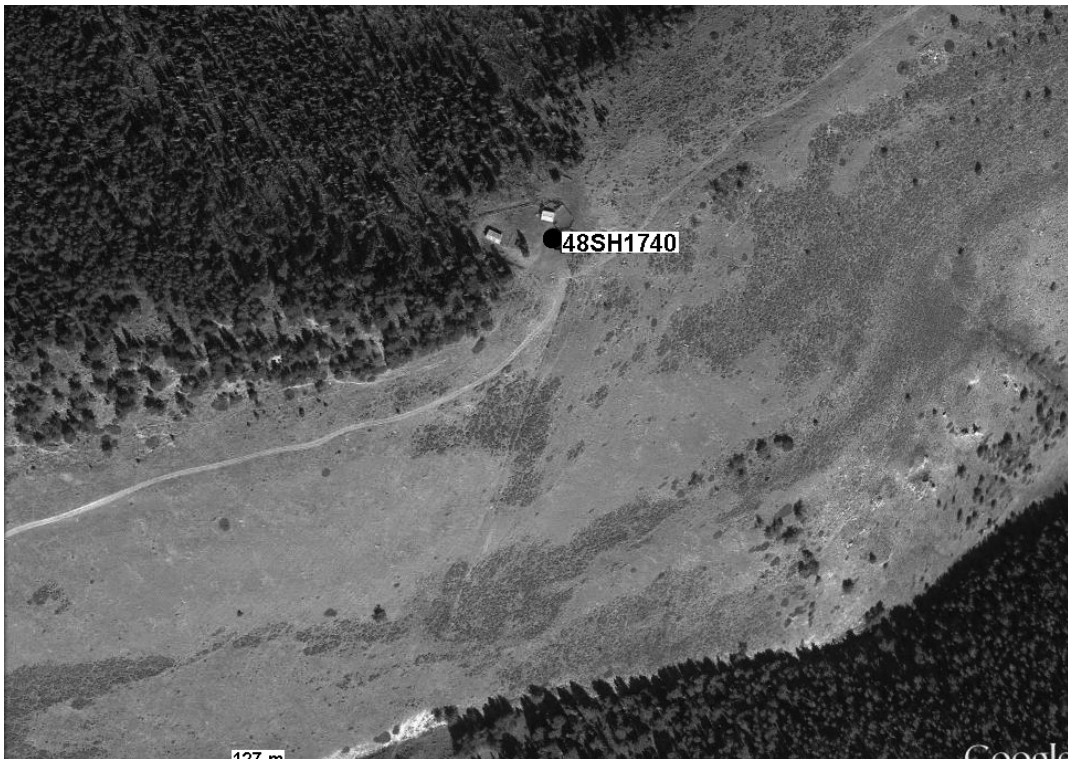
All units were oriented towards true (not magnetic) cardinal directions. Excavations were conducted with hand tools following natural strata when evident, or in arbitrary 10



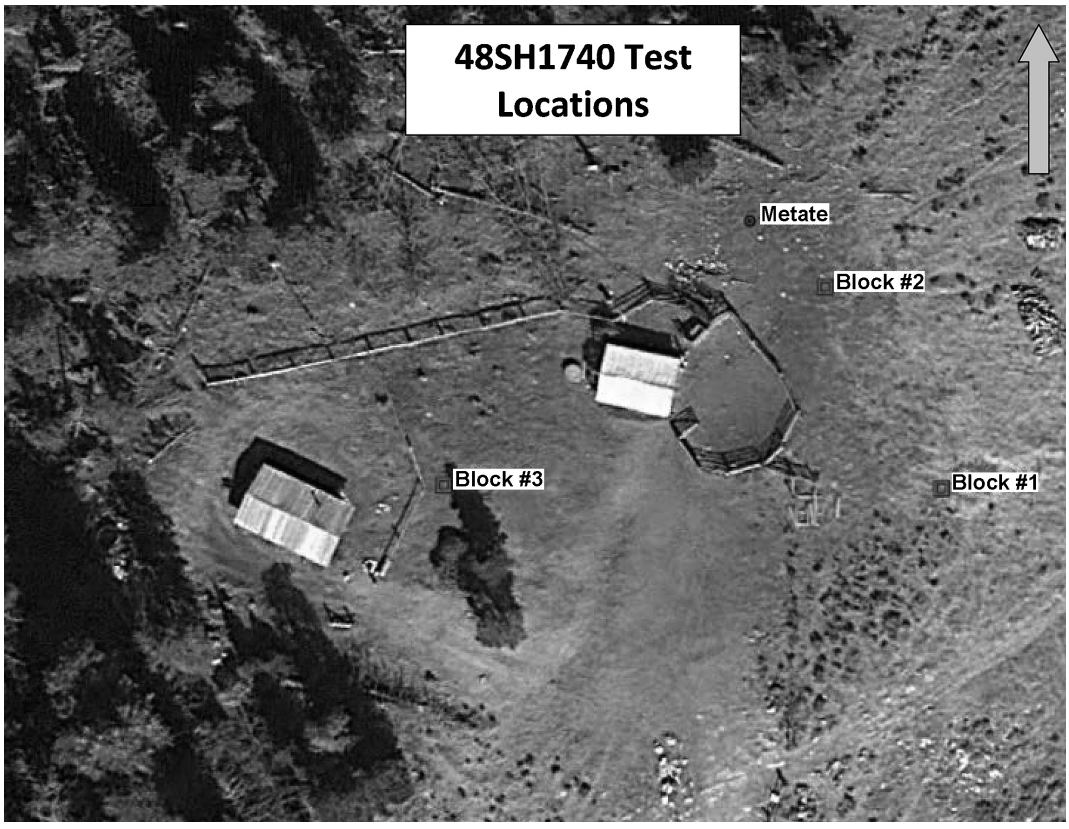
cm vertical levels for provenience control. All subsurface measurements were taken using the southwest corner of the unit as a datum. All soil matrix was passed through 1/4 or 1/8 inch mesh, depending on the discretion of the field supervisor (Matthews). Each meter of a given four square meter block was assigned a number designation, as illustrated, and excavated individually and recorded by unit and level. For example; Block # 1, Unit #2, Level #III. All excavation information was recorded on Unit Level Forms. The excavation forms included information on artifact provenience, soil type, lithic material type, etc. Digital color photographs were taken and floor plans were drawn of each block when a given level was completed. The only exception to this standard of recordation was when there was no recognizable distinction between the current level and the previous level. Final wall profiles were drawn to scale with a line level and Munsell soil color chart. Photo documentation was a priority. Detailed field notes were kept by the field supervisor for each excavation block, supplemented by excavation forms filled out by the crew members.

BLOCK #1

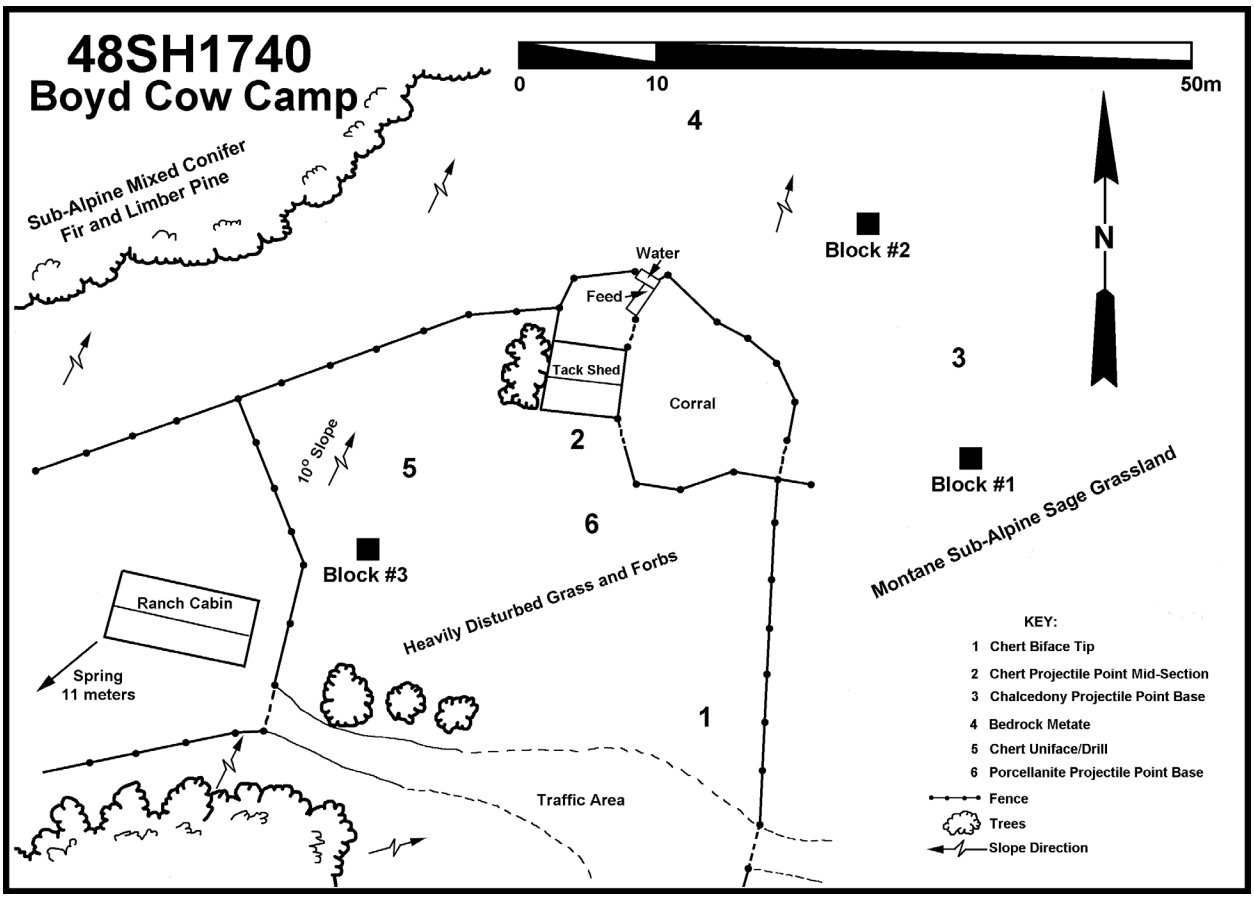
Block #1 is the furthest east of the three excavation blocks and located about 15 meters east of the cow camp enclosure fence and 25 meters north of FS Trail #96. This two-meter-square block is located in a fairly flat grassy area with associated forbs and sedges. Ground



Boyd Cow Camp location.

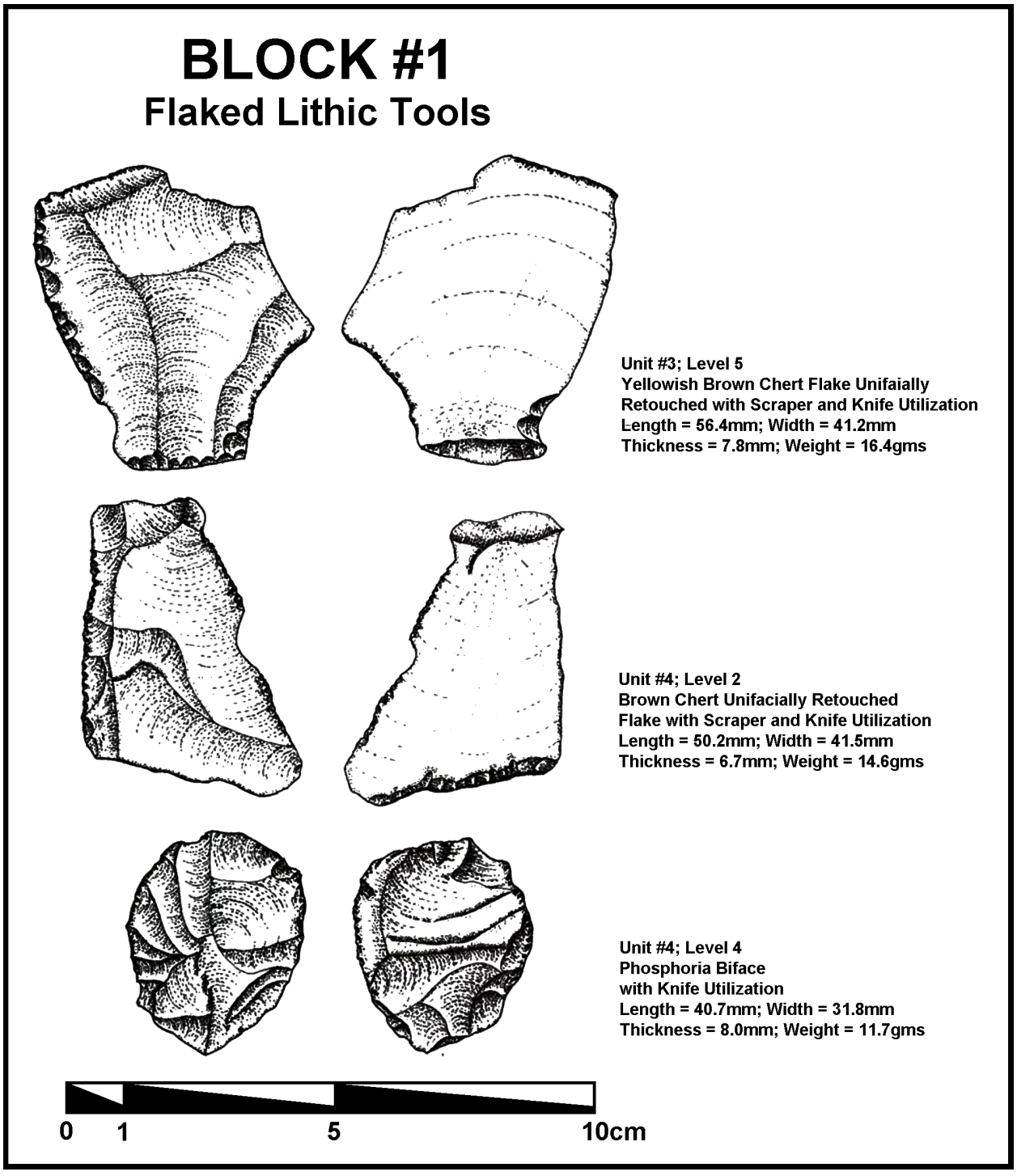


48BH1740 excavation blocks layout.



48BH1740 site map.

Block #1 looking generally East.

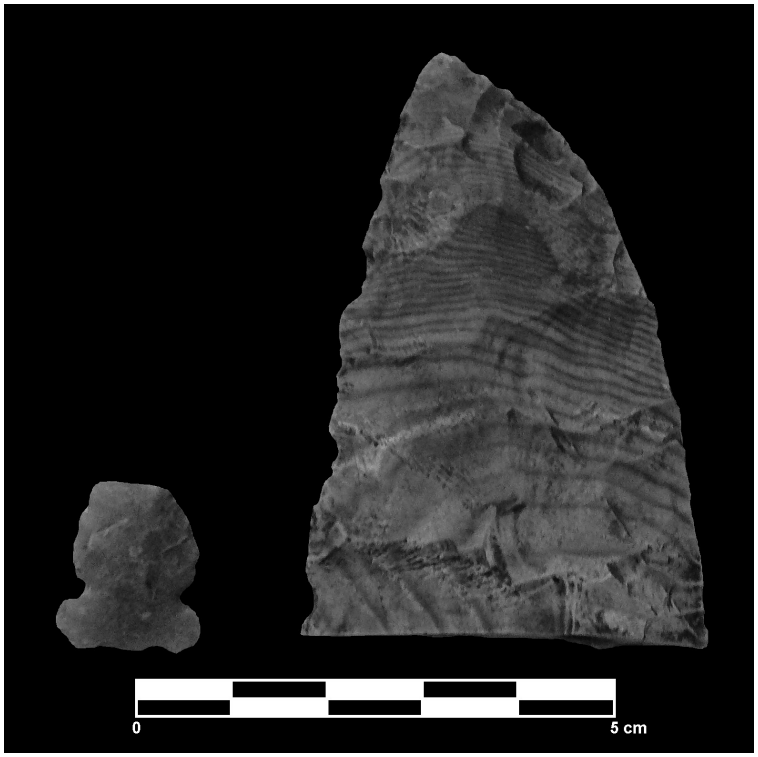


surface visibility was about 20 percent. Datum was the SW corner of the block and the starting depth is 10cm below datum (BD).

BLOCK #2

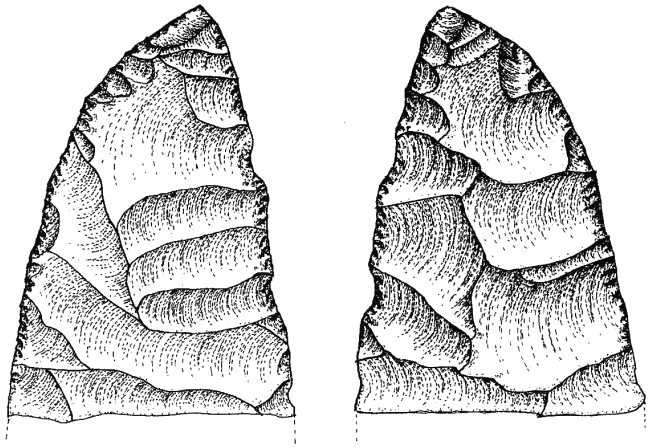
Block #2 was the most northerly of the three excavation blocks and located about 20 meters north of Block #1. This two-meter-square block was located in a fairly flat grassy area with associate forbs and sedges. Ground

Block #2, looking East. Block #1 in background on horizon.

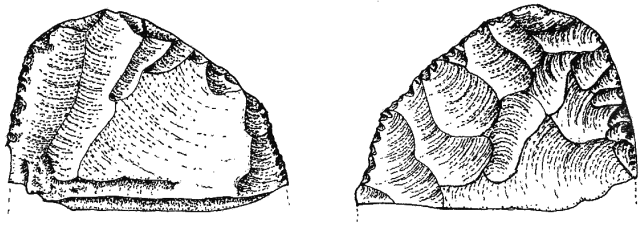


Artifacts from Block #2, Level IV, Unit 2.

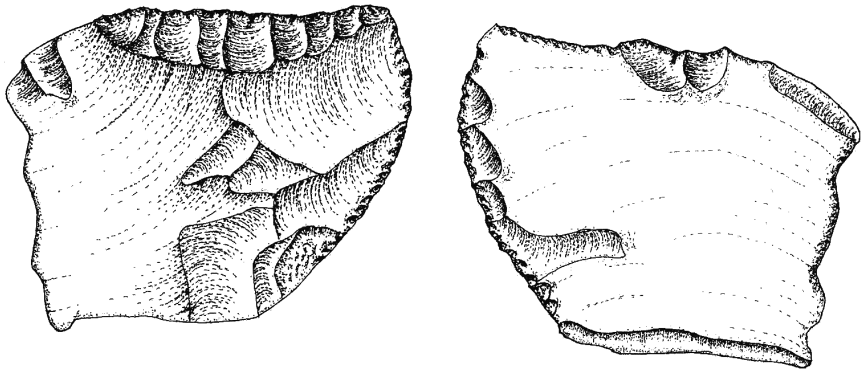
BLOCK #2
Flaked Lithic Tools



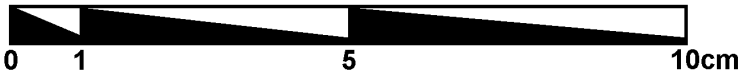
Unit #2; Level 4
Banded Chert Biface with
Knife and Scraper Utilization
Length = 59.9mm; Width = 41.9mm
Thickness = 6.2mm; Weight = 16.2gms



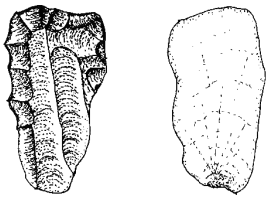
Unit #3; Level 3
Phosphoria Biface with Knife Utilization
Length = 30.2mm; Width = 41.1mm
Thickness = 6.6mm; Weight = 9.8gms



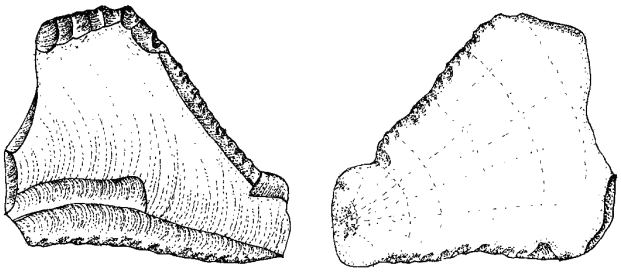
Unit #3; Level 4
Oxidized Tan Quartzite
Biface with Knife and
Scraper Utilization
Length = 46.3mm
Width = 56.4mm
Thickness = 9.0 mm
Weight = 29.7gms



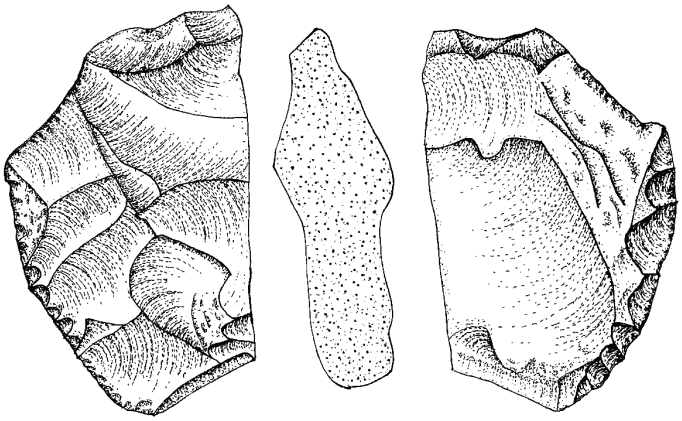
BLOCK #2
Flaked Lithic Tools



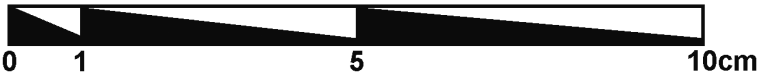
Unit #3; Level 4
Clear Quartz Uniface Scraper
Length = 25.9mm; Width = 14.1mm
Thickness = 6.1mm



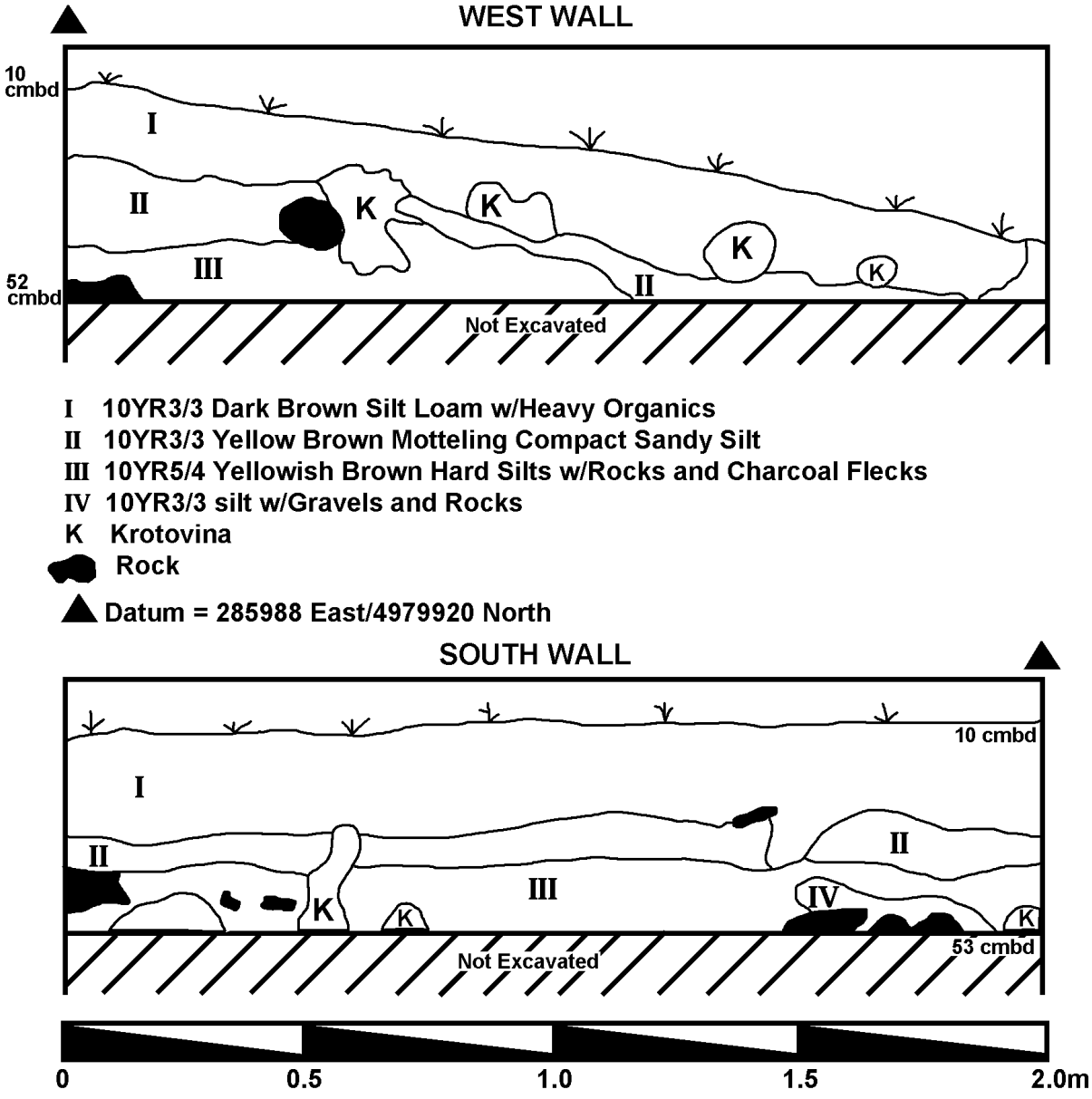
Unit #4; Level 1
Waxy Yellowish Tan Unifacially Retouched Chert Tertiary Flake Utilized as a Knife and Scraper
Length = 34.7mm; Width = 41.4mm
Thickness = 6.2mm; Weight = 9.2gms



Unit #4; Level 1
Dark Purple Chert Biface with Chopping and Hammering Utilization
Length = 58.0mm; Width = 36.1mm
Thickness = 18.2mm; Weight = 44.8gms



48SH1740
Block #2 Wall Profiles



surface viability was about 20 percent. Block datum was the SW corner and the staring depth is 10cm below datum (BD).

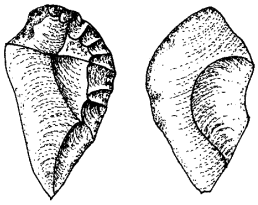
BLOCK #3

Block #3 is the most western of the three excavation blocks and about 45 meters west of Block #1 and 45 meters southwest of Block #2. The cow camp's cabin is ten meters southwest and the spring twelve meters southwest of Block #3. This two-meter-square block was located in a fairly flat grassy area with associated forbs and sedges. Ground surface viability was about 20 percent, with a major amount of animal mounds

Block #3, looking West.

West Wall Profile

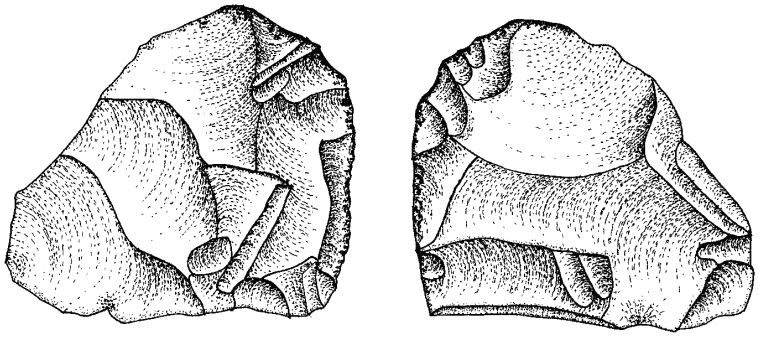
BLOCK #3
Flaked Lithic Tools



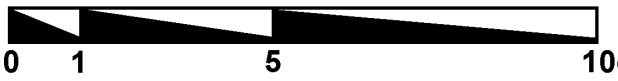
Unit #1; Level 1
Broken Red Chert Utilized Uniface
Length = 28.1mm; Width = 15.7mm
Thickness = 5.5mm; Weight = 2.4gms

Unit #1; Level 1
Corner of Broken Red Chert Biface/Point
Length = 9.6mm; Width = 10.3mm
Thickness = 3.4mm; weight = 0.6gms

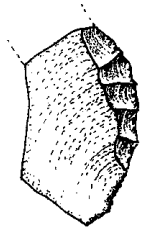
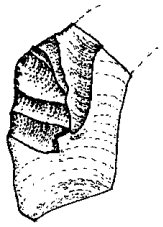
Unit #1; Level 1
Purple Chert Late Prehistoric
Small Corner Notched
Projectile Point with Cortex
Length = 14.3mm; Width = 12.6mm
Thicknes = 2.7mm; Weight = 0.4gms



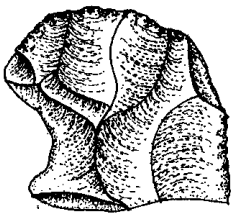
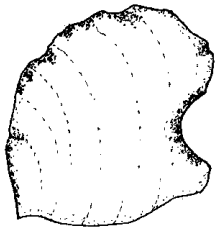
Unit #1; Level 2
Dark Red Chert Biface with
Knife Utilization and Noticible
Crushing and Hammering
Length = 58.8mm
Width = 46.4mm
Thickness = 16.9mm
Weight = 467gms



BLOCK #3
Flaked Lithic Tools

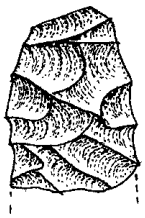
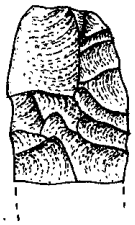



Unit #1; Level2
Dense Quartzite Tertiary Flake
Bifacially Retouched with Knife Utilization
Length = 22.3mm; Width = 13.6mm
Thickness = 3.3mm; Weight = 1.3gms

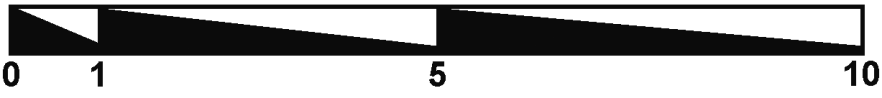



Unit #2; Level 3
Grey Porcellanite Uniface with
Scraper and Spoke Utilization
Length = 24.2mm; Width = 22.7mm
Thickness = 7.4mm; Weight = 3.9gms

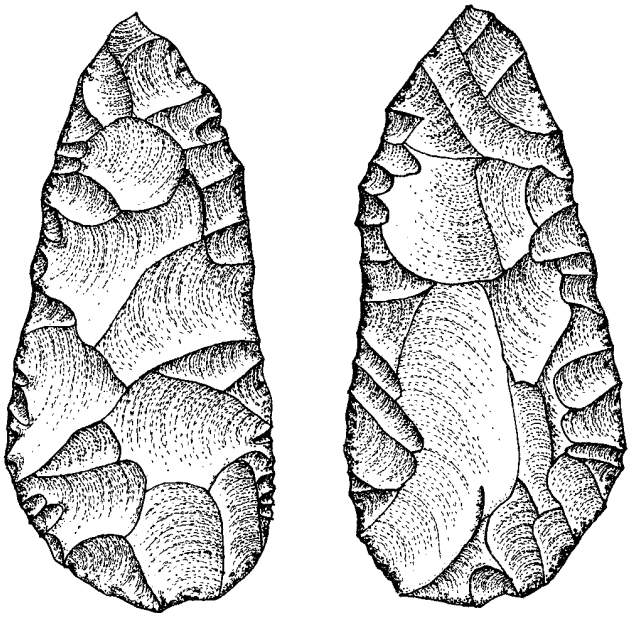

Unit #2; Level 3
Purple Chert Projectile Point with
tip Snapped Off - Possible Preform
Length = 19.4mm; Width = 15.4mm
Thickness = 2.3mm; Weight = 0.8gms

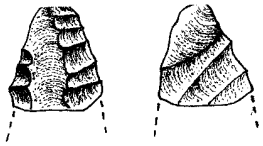
Unit #2; Level 5
Fine-grained Grey quartzite Biface
with Snap Break - Possible Manufacturing
Length = 22.1mm; Width = 14.7mm
Thickness = 3.4mm; Weight = 1.2gms



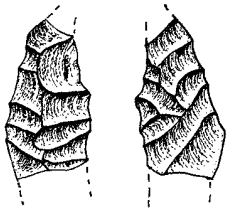
BLOCK #3
Flaked Lithic Tools



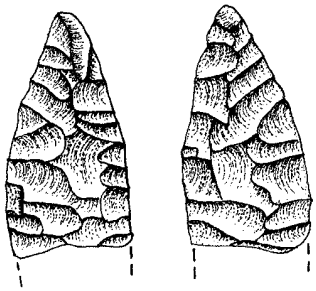
Unit #2; Level 5
Heavily Utilized Quartzite Biface
with No Signs of Hafting Preparation
Length = 79.8mm; Width = 34.5mm
Thickness = 8.8mm
Weight = 25.8gms



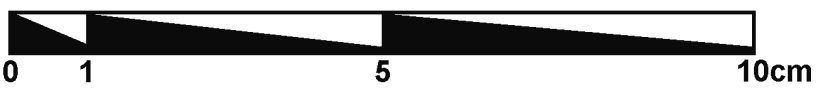
Unit #3; Level 2
Quartzite Biface/Projectile Point Tip
Length = 14.2mm; Width = 11.9mm
Thickness = 2.7mm; Weight = 0.4gms



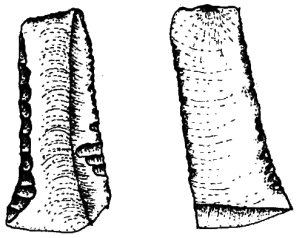
Unit #3; Level 3
Quartzite Point with Base and Tip Missing
Length = 19.7mm; Width = 11.0mm
Thickness = 2.5mm; Weight = 0.7gms



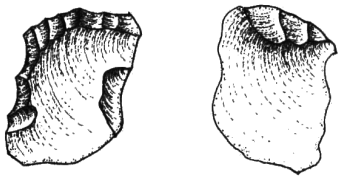
Unit #3; Level 4
Waxy Grey Chert Biface
Probable Archaic Projectile Point
Length = 32.3mm; Width = 16.8mm
Thickness = 4.5mm; Weight = 2.9gms



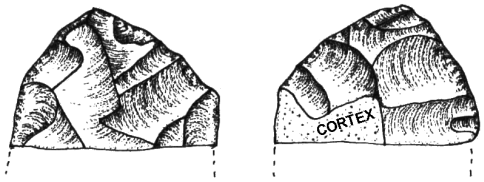
BLOCK #3
Flaked Lithic Tools



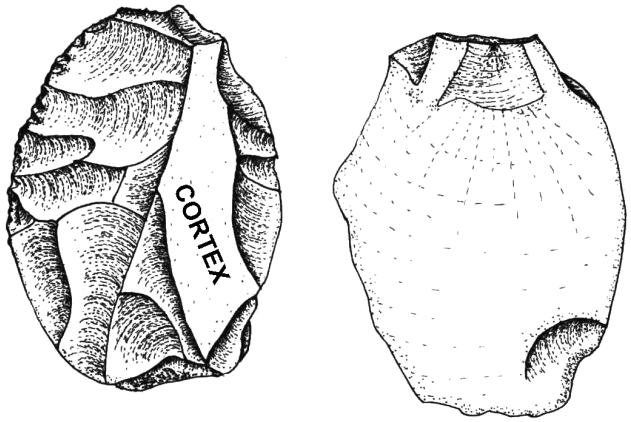
Unit #4; Level 1
Unifacially Retouched White Chert
Tertiary Flake with Knife Utilization
Length = 29.9mm; Width = 13.0mm
Thickness = 4.8mm; Weight = 2.0gms



Unit #4; Level 3
Red Chert Biface Fragment
Length = 23.0mm; Width = 15.6mm
Thickness = 4.5mm; Weight = 0.9gms

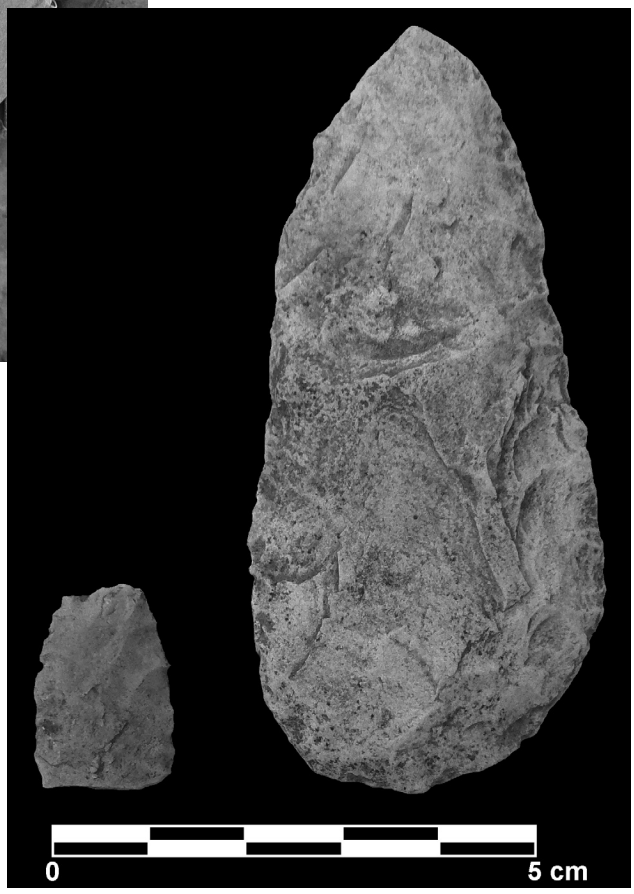


Unit #4; Level 3
Knife Utilized Chert Biface Tip
with Cortex and Snap Break
Length = 19.1mm; Width = 28.3mm
Thickness = 5.3mm; Weight = 3.2gms



Unit #4; Level 3
Purple Phosphoria Secondary Flake
Unifacially Flaked Scraper
Length = 53.5mm; Width = 38.0mm
Thickness = 16.9mm; Weight = 35.5gms

Block #3, Knife in situ.



Artifacts from Block #3.

Final floor of Block #3.

on the surface. Excavation were broken down by levels, for horizontal control and units. Datum was the SW corner of the block and the starting depth was 10cm Below Datum (BD).

BLOCK #4

This is an excavated 1m x 1m unit placed around a surface bedrock metate or grinding slick. The marginally exposed grinding slick was 15 meters northwest of Block #2 and 18 meters north of the cow camp's barn/tack shed. The ground stone artifact was situated on a north-sloping hill located in a grassy area with associated forbs and sedges. The unit was placed around the slick to excavate what was thought to be, in all likelihood, a "portable" metate. Upon removing the soil the crew discovered the artifact was formed ("grooved") within a large section of granite bedrock. The area around the ground stone was excavated in 10cm levels starting with the southern half of the unit and going down to 10 cm BD, and because of the slope of the hill, the northern half was eventually excavated deeper than 10 cm BD. Level II incorporated the whole meter-square unit. The southeast corner was the datum and is at 0 BD, or ground surface.

SITE LITHICS

SURFACE ARTIFACTS

Walking an initial tight transect, and, while subsequently traversing the site, the crew surveyed the ground for artifacts; six flaked, formal tools were found. The locations of all of these tools were provenienced on the site map, photographed and drawn to scale.

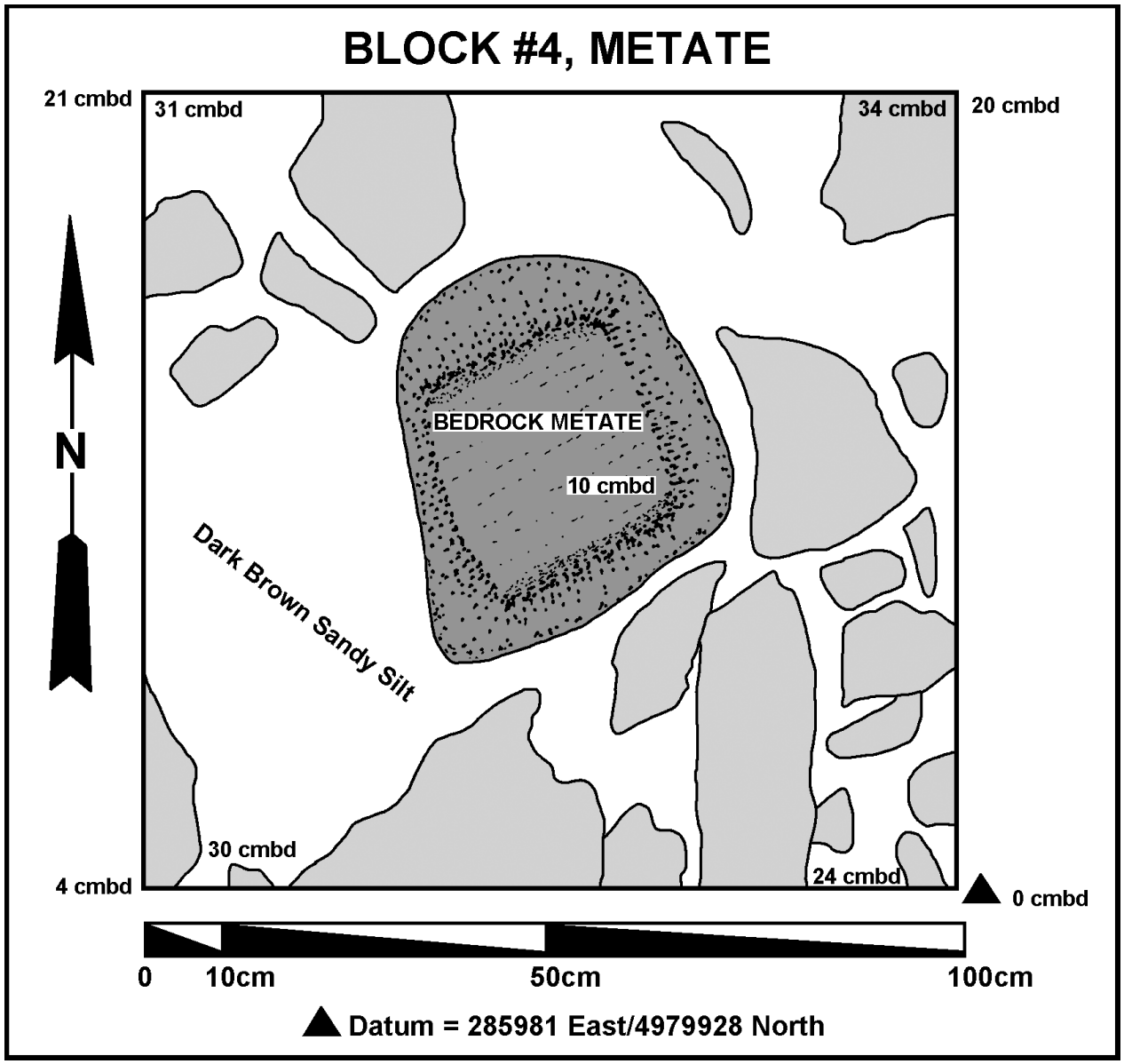
EXCAVATED LITHICS

Block #1: The largest number of artifacts (40.5%) came from Level IV of the block at a final depth of 50 cm BD.

Block #2: The highest number of artifacts (48.0%) came from Level III at a final depth of 40 cm BD.

Pre-excavation view of Block 4, looking South.

Block #4 excavations, final floor, looking South.



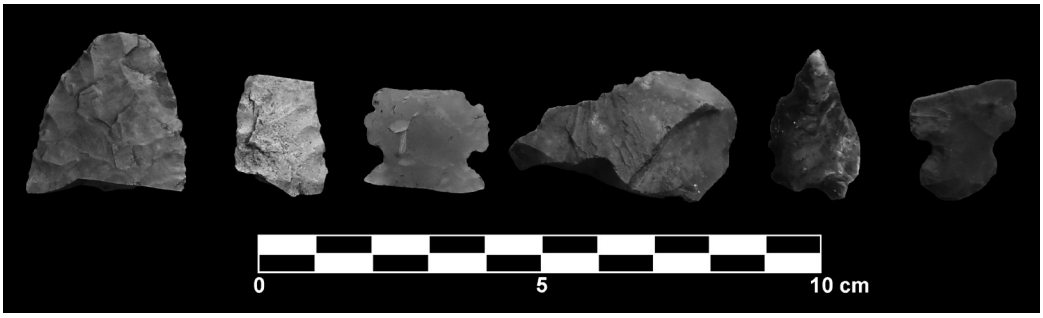
Bedrock metate final plan view map.

Block #3: The largest number of artifacts (49.2 %) from this block were recorded from Level III at a final depth of 50 cm BD.

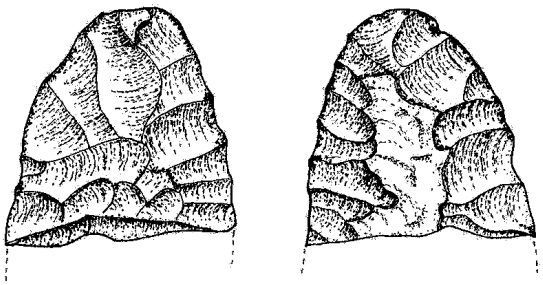
RAW MATERIAL TYPES AND THEIR PROBABLE SOURCE LOCATIONS

Outcrops of various aged geological formations can be found throughout the Big Horn Basin and surrounding ranges; therefore, multiple lithic types are present in the immediate study area. Materials include various quartzites from the Bighorn Formation in the Bighorn and Pryor Mountains, Mississippian cherts from places such as the Spanish Point quarry and in the Bridger Mountains, Pennsylvanian cherts from the eastern and southern Bighorn Mountains, Phosphoria cherts from the Bighorns, and porcellanite from the Fort Union Formation, the latter is associated with the Tongue and Powder River breaks east by northeast of the Bighorns.

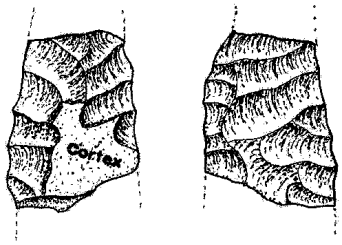
Six broad material categories were recorded at 48SH1740, and include chert, quartz-



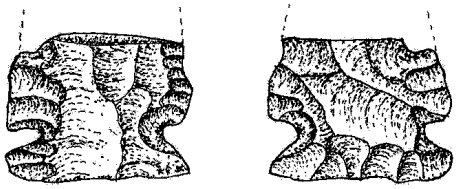
SURFACE LITHIC TOOLS



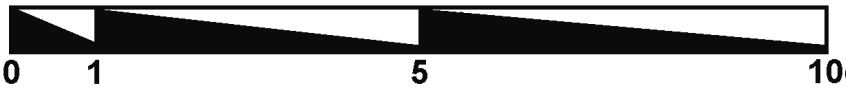
Artifact #1
Fine-grained, light Tan Quartzite Biface with Light Knife Utilization
Length = 27.9mm; Width = 27.5mm
Thickness = 5.6mm; Weight = 4.6gms

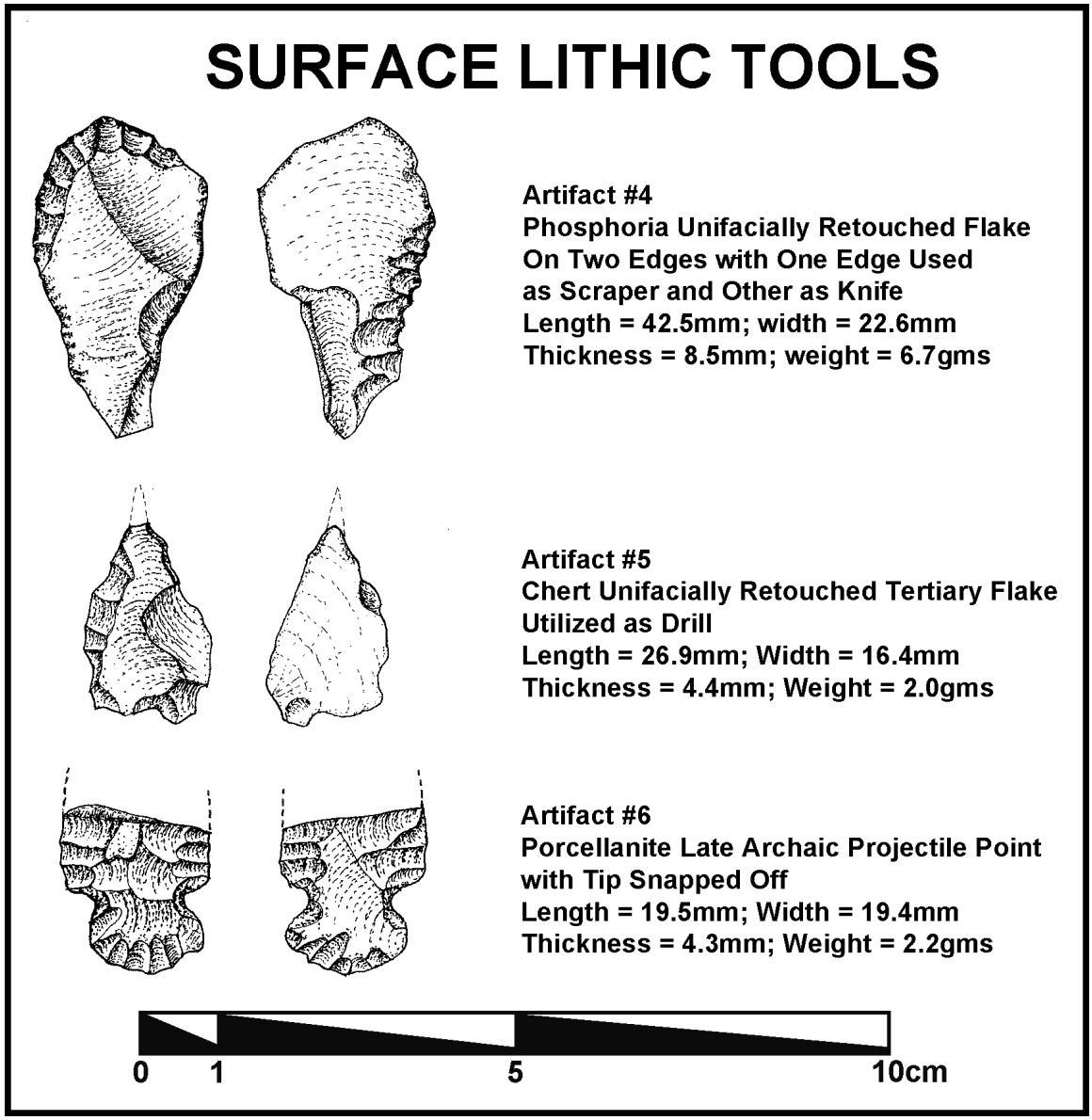


Artifact #2
Fine-grained, Light tan Quartzite Biface Midsection (probable Projectile Point)
Length = 21.8mm; Width = 16.0mm
Thickness = 5.7mm; Weight = 2.0gms



Artifact #3
Clear Chalcedony Late Plains Archaic Side-notched Projectile Point Base
Length = 17.7mm; Width = 22.3mm
Thickness = 4.2mm; Weight = 2.2gms





ite, basalt, chalcedony, quartz and obsidian. Specific descriptions of the six materials and subtypes, as well as possible lithic material locations, quality and versatility follow. Chert artifacts are most numerous at the site representing 81% of lithic inventoried with quartzite, basalt, porcellanite, quartz and obsidian following in decreasing order.

Three obsidian hydration dates were obtained from three obsidian samples recovered from Block #1 (Origer's Obsidian Laboratory, February 29, 2012): Level II, Unit 3 at 2333 years BP, Level II, Unit 4 at 3106 years BP and Level III, Unit 3 at 3683 years BP. These data suggest a minimal site use/occupation of 1350 years. All three volcanic glass samples were sourced to Obsidian Cliff, Yellowstone National Park (Geochemical Research Laboratory, February 11, 2012).

Basic techniques of examination and data collection were conducted on the lithic flake tools from the site. All tools were placed into a few morphological/functional types, such as projectile point, biface, uniface or retouched

Block #1 lithic counts.

BLOCK #1	UNIT #1	UNIT #2	UNIT #3	UNIT #4	TOTALS
Level I	7	NA	NA	5	12
Level II	32	8	6	11	57
Level III	13	20	18	8	59
Level IV	23	22	44	63	152
Level V	42	12	10	14	78
Level VI	3	4	4	4	15
Total	120	66	82	105	373

Block #2 lithic counts.

BLOCK #2	UNIT #1	UNIT #2	UNIT #3	UNIT #4	TOTALS
Level I	14	NA	NA	20	34
Level II	30	21	18	31	100
Level III	33	35	50	53	171
Level IV	17	14	15	5	51
Total	94	70	83	109	356

Block #3 lithic counts.

BLOCK #3	UNIT #1	UNIT #2	UNIT #3	UNIT #4	TOTALS
Level I	58	10	2	63	133
Level II	79	63	114	209	465
Level III	182	179	58	352	771
Level IV	31	39	48	16	134
Level V	3	30	25	5	63
Totals	353	321	247	645	1566

flake. Other recorded data include material type, stage of production, and measurements. Forty-three formal flaked tools were recovered. All of the tools were described in their associated Block, Level and Unit description, as well as photographed and drawn to scale; the retouched flakes were not drawn.

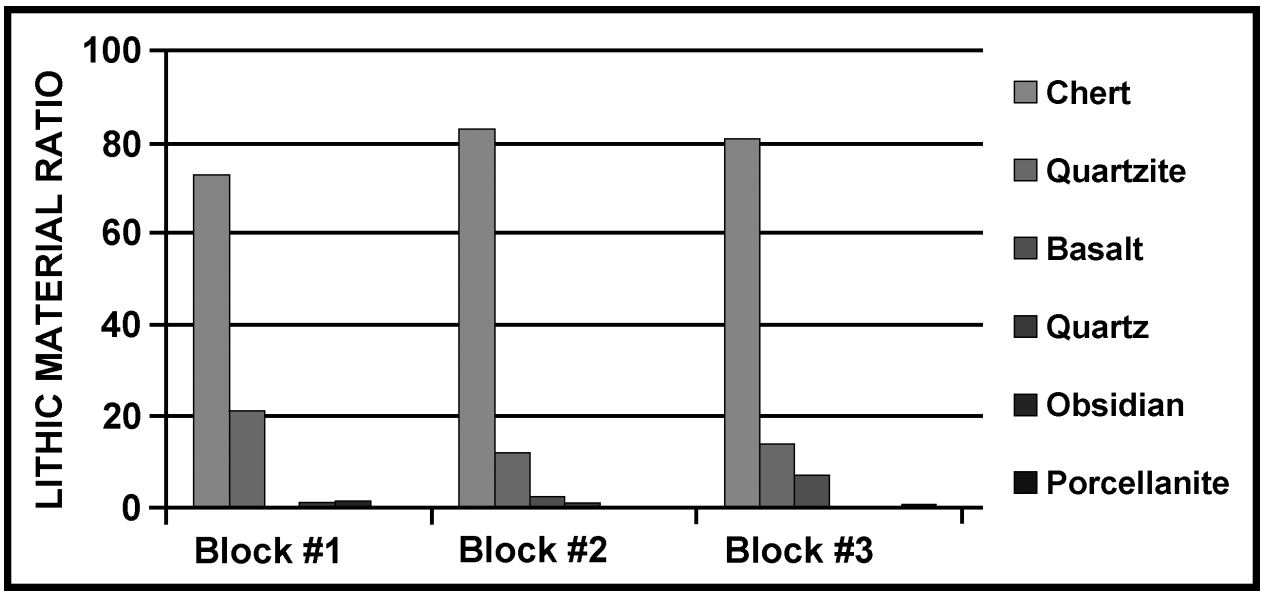
The biface ratio to the other formal tools, projectile points and unifaces is 2:1. What we can infer from this information is speculative because of the probability some of the bifaces and unifaces could be associated with an expedient industry, while the projectile points reflect traditional hunting use.

Chronologically, from point typologies alone, the use of the site dates from the Middle Archaic (5500-3000 BP) as seen by the presence a Hanna point from the McKean-Techno-Complex, through to the Late Archaic and the Late Prehistoric, ending around 250 BP. This interpretation also correlates well with the oldest obsidian hydration date of 3683 BP.

CHRONOLOGICAL TYPOLOGY

Projectile points recovered during this project include:

- Middle Archaic (5500-3000 BP): A single Chert Hanna point representing the McKean-Technocomplex was recovered.



- Late Archaic (3100 to 1200 BP): Two large side-notched projectile points were recovered. One is porcellanite with a convex base; the second is a clear chalcedony with a flat base.

- Late Plains (600-200 BP): One side-notched, quartzite projectile point, two different portions of small, chert corner-notched projectile points and a red chert concave base, as well as other probable projectile point body sections were recovered representing this time period.

CONCLUSIONS

Site 48SH1740 likely represents a field camp and work station. The presence of flaked lithic debitage, representing the whole stage of reduction from depleted cores down to small tertiary flakes, suggests tool manufacturing as well as tool maintenance. The artifacts were observed on the surface as well as recovered from the excavation blocks. The presence of a heavily used bedrock metate suggests plant/seed or hide processing activities, likely associated with traditionally female tasks. Not only does this item suggest some level of family dynamics, not just male hunting groups, but suggests the site was more than an expedient location, one of re-use, with seasonal, yearly or possibly generational occupations. The pro-

Excavated blocks lithic material by recovered percentages.

	TOTAL LITHICS	CHERT	QUARTZITE	BASALT	QUARTZ	OBSIDIAN	PORCELLANITE
Block #1	373	271	77	NA	2	5	NA
Percentage		73%	21%	NA	1.07%	1.3%	NA
Block #2	356	295	43	9	3	NA	NA
Percentage		83%	12%	2%	.5%	NA	NA
Block #3	1566	1271	228	118	3		7
Percentage		81%	14%	7.5%	.19%		.45%

Formal flaked tool distribution by tool type and excavation block.

Tools	Projectile Point	Biface	Uniface	Retouched	Total
Block #1	2	6	2	1	11
Block #2	1	4	1	1	7
Block #3	5	8	5	1	19
Surface	2	2	2	0	6
Total	10	20	10	3	43

portionally somewhat equal ratio of projectile points to unifaces gives argument for use as a hunting camp and processing location, i.e., a work station. The ratio of tertiary flakes to secondary and primary flakes would suggest tool modification, retouching or the final stages of lithic reduction in tool manufacturing. One would believe a more permanent "Residential Base" would have more remnant cores as well as debitage

The site setting has many attractive elements to make it advantageous for prehistoric habitation. The site has good protection from the wind, good exposure to the sun (yet access to shade if needed), and proximity to water, visual aesthetics, and the like. The site location offers ideal access routes to the associated drainages, as well as to the various ridges of the area. The abundance of lithic material in the general area cannot be overstated. The site is also located on a natural route accessing high elevation, alpine meadows (9400+ feet) to the south; areas of Bighorn sheep hunting. It is assumed these many positive functional attributes lend themselves to a relatively long duration of occupation.

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