

NEW PRODUCTION REACTOR ARCHAEOLOGICAL SAMPLE SURVEY

1990

Submitted to

EG&G Idaho, Inc.
Earth and Life Sciences
Idaho Falls, Idaho

Submitted by

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December 1990

MANAGEMENT SUMMARY

During the period between August 12 and September 16, 1990, personnel from the Northern Intermountain Quaternary Institute (NIQI) conducted a cultural resource inventory of thirty randomly selected forty-acre quadrats within the lava flows surrounding NPR Area E on the Idaho National Engineering Laboratory. The inventory was performed in order to make predictions of cultural resource density in the basaltic regions adjacent to NPR Area E that may be impacted by future construction activities associated with the New Production Reactor. The sample universe covers approximately 28,350 acres, of which 4.2% of the total area was sampled during this survey.

The survey resulted in the recording of 78 previously unknown cultural resources. All of the resources encountered during the survey were prehistoric in content. No historic remains were located. Of the resources encountered, 38 are isolated finds and due to their limited capacity for providing information beyond the initial recording, are not considered eligible to the National Register of Historic Places. The remaining 40 resources have been designated as potentially significant sites. In other words, they may provide critical information toward our understanding of regional prehistory. All of these resources may be eligible to the National Register of Historic Places and will require some form of subsurface testing in order to assess their eligibility. It should be noted that eight of the resources encountered (seven isolated finds and one site) are located outside of the designated sample quadrats. These resources were recorded and significance assessments and locational information have been provided. However, they are not included in the cultural resource density predictions provided in this report.

Based on the information generated from this survey, it is projected (at the 95% confidence level) that 1652 ± 471 cultural resources are contained within the 28,350 acre NPR archaeological sample universe. Of these resources, 730 ± 333 are expected to be isolated finds that will not require work beyond the initial recording. The number of expected potentially significant sites within the sample universe is 922 ± 339 . These resources will require additional investigation and/or mitigation procedures as dictated by federal guidelines and in consultation with the State Historic Preservation Office prior to any adverse impacts resulting from future construction activities.

It should be noted that while the predictions provided in this report concur with the findings of previous surveys of the lava zone on the INEL, only a small portion of the total sample universe was surveyed. Because small sample size can greatly effect the reliability of predictions, the site densities projected in this report should be used only as a general guide for future work.

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INTRODUCTION

Project Description and Purpose

During the period between August 12 and September 16, 1990, personnel from the Northern Intermountain Quaternary Institute (NIQI) conducted a cultural resource inventory of thirty randomly selected forty-acre quadrats within and defined by the lava zone surrounding NPR Area E and the PBR/SPERT facility. The survey sample universe encompasses 28,350 acres primarily located in the region east of NPR Area E (Figure 1). This region is characterized by gently rolling basalt pressure ridges and basalt outcrops with sagebrush and rabbitbrush as the dominant vegetation. Accumulations of aeolian sediments have formed on the lee side of many basalt ridges and knolls. The inventory was performed in order to make predictions of cultural resource density in these regions adjacent to NPR Area E that may be impacted by future construction activities associated with the New Production Reactor facility.

Project Organization

All tasks carried out by Northern Intermountain Quaternary Institute personnel for the completion of the 1990 NPR sample survey were performed under the direction of the Principal Investigator, Dr. Richard Holmer. Field and laboratory duties were directly supervised by Lael Suzann Henrikson, Project Director. The field duties, including the locating of sample quadrats and recording of cultural resources, were conducted by qualified crew leaders, Norman Henrikson and Steven Wright. They were assisted by Jeff Shelton, Mark Muracchioli, Lisa Truitt, Sean Blaine and Brock Jones. Laboratory duties including data entry on Archeocompute, drafting and illustration of features and uncollected artifacts were completed by Lael Suzann Henrikson, Jeff Shelton and Norman Henrikson. Steven Wright illustrated the collected artifacts. Cynthia Wallecz cleaned and labelled the artifacts in preparation for curation.

The sample universe was defined and sample quadrats selected by Brenda Ringe of EG&G. Because the 40-acre quadrats were randomly selected from within a sample universe contained in a largely undeveloped area, the field work was performed in several phases in an attempt to achieve maximum efficiency. The initial phase was performed by NIQI crew chiefs (with the periodic assistance of EG&G personnel) and involved locating the selected quadrats using a compass and pacing with the aid of section markers and topographic features. Once a corner of a quadrat was determined, the boundaries of that quadrat were defined and flagged at 50 meter intervals. The crew chiefs located and flagged four or five quadrats before crews were brought in to conduct the cultural resource inventory. Survey crews walked in north-south or east-west transects spaced at 15

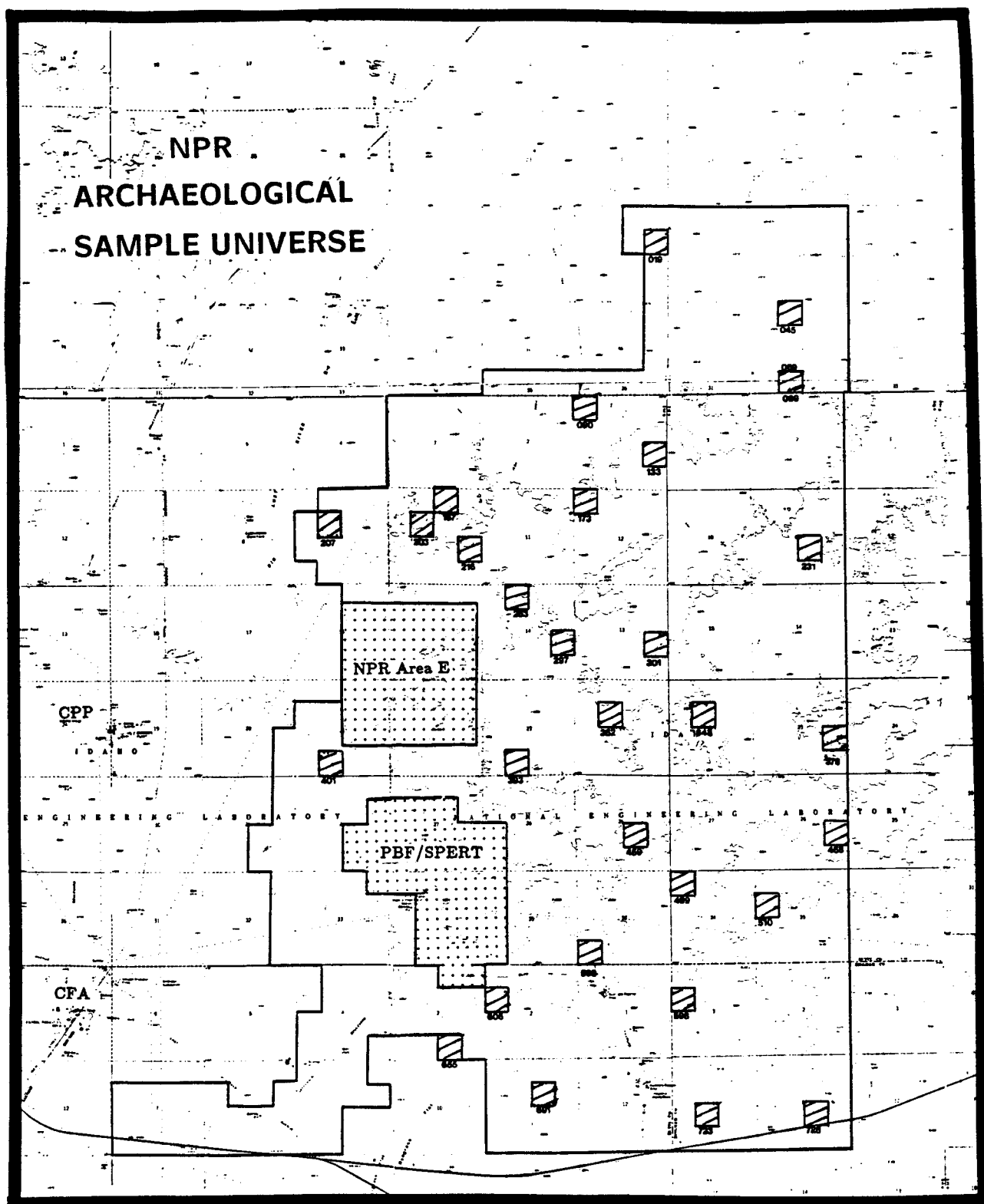


Figure 1. The NPR archaeological sample universe showing the location of all surveyed 40-acre quadrats.

to 20 meter intervals from boundary to boundary. This ensured near-complete coverage of the ground surface.

Cultural resources encountered during the survey were assigned a temporary field number and recorded as either a "site" or an "isolated find". According to the definitions established for NIQI procedures, sites are defined as nine or more artifacts in a discrete concentration separated from other concentrations by at least 100 meters or by topographic features such as basalt ridges, rivers, etc. The designation of sites and isolated finds is not always clear-cut, however, because these determinations dictate significance evaluations and ultimately whether or what mitigation procedures will be required. For example, in some cases, the site designation is extended to occurrences of less than nine artifacts when they are located in accreting aeolian sediments. This is a cautionary measure taken because of the possibility that subsurface cultural deposits may be present but not implied by the surface assemblage. Otherwise, all isolated finds encountered are considered mitigated after the initial recording. All sites were recorded on Intermountain Antiquities Computer System (IMACS) site forms and these can be located in Appendix B of this report. Isolated finds were recorded on NIQI isolated find forms and are provided in Appendix C of this report.

Scaled planimetric maps were completed for all sites and less formal sketch maps were drawn of isolated find locations when possible. The plan maps illustrate the position of the site with the surrounding topographic features as well as the spatial relationships of artifacts and cultural features. Temporary datum points were established within or near site boundaries in order to document the location of tools, diagnostics, lithic or bone concentrations and cultural features. Directions and distances of artifacts from the datum were determined with a hand-held compass and pacing. Artifacts were collected only when deemed "diagnostic", either chronologically or functionally (e.g., projectile points, ceramics, scrapers, drills etc.). Uncollected artifacts such as bifaces and expedient tools were sketched in the field and left where originally found. These sketches are attached to the corresponding site forms in Appendix B. A planimetric map was made for most of the cultural features or possible cultural features encountered during the survey, and their functions have been suggested based primarily on ethnoarchaeological observations.

Artifacts collected during the course of this survey were cleaned and labelled with Smithsonian site numbers and documented on Artifact Catalog sheets by NIQI personnel. They will be housed within NIQI until curated with their accompanying documentation at the Southeast Idaho Regional Archaeological Center at the Idaho Museum of Natural History.

PREVIOUS INVESTIGATIONS

The Transmission Corridor Surveys performed in 1985, including the 135kV Line and the T-24 Survey, transect the sample universe east from PBF to Argonne National Laboratory. However, the sample quadrats randomly selected for this survey did not include any part of these previously inventoried areas. The results of the Transmission Corridor Surveys as well as their locations can be found in Reed (et.al. 1987).

PROJECT RESULTS

The 1990 NPR sample survey resulted in the identification of 78 previously unrecorded cultural resources. Of these, one site and seven isolated finds were encountered outside or adjacent to the designated sample quadrats. These include 10BM274, 10BM275, 10BM276, 10BT1640, 10BT1643, 10BT1669, 10BT1680 and 10BT1689. Summaries of these resources have been included in this section along with all other resources encountered. However, because the resources listed above were not found within sample quadrats, they have not been included in the statistical predictions provided in this report. Seventy cultural resources were located within the sample quadrats. Of these, 31 are isolated finds and 39 are sites. The legal and topographic locations for all cultural resources encountered during this survey have been provided in Appendix A of this report.

Isolated Finds

Of the cultural resources located within sample quadrats 31 have been designated as isolated finds (fewer than nine artifacts). Isolated find locations are usually represented by projectile points and other tool fragments associated with short term activities related to hunting game. As stated previously, these resources are restricted to a surface context and are recommended for full clearance after the initial recording has taken place. Table 1 provides a description of each isolated find located within the sample quadrats. All Isolated Find forms and associated artifact illustrations are included in Appendix C.

Table 1. Isolated Finds Located
in the 1990 NPR Archaeological Sample Quadrats

Smithsonian Number	Location	Description
10BM266	Quadrat 723	One large corner-notched projectile point.
10BM268	Quadrat 598	One large corner-notched projectile point frag.
10BM269	Quadrat 598	One volcanic glass biface fragment.
10BM270	Quadrat 598	One large corner-notched point fragment, volcanic glass.
10BM271	Quadrat 598	One silicate steep-end scraper, two flakes.
10BM272	Quadrat 598	One large corner-notched point, gray silicate.
10BM273	Quadrat 598	One Desert Side-notched point, volcanic glass.
10BM274	Outside Quadrat 728	One large corner-notched point, volcanic glass.
10BM276	Outside Quadrat 728	One biface fragment, one scraper, 6 flakes.
10BT1631	Quadrat 263	One biface fragment, volcanic glass.
10BT1632	Quadrat 263	One ignimbrite point fragment, badly broken.
10BT1633	Quadrat 216	One volcanic glass biface fragment.
10BT1634	Quadrat 655	One volcanic glass biface fragment.
10BT1635	Quadrat 167	One notched point frag. (volcanic glass), one point tip, and one secondary flake.
10BT1636	Quadrat 167	One volcanic glass Elko Corner-notched point.

(Table 1 cont.)

10BT1637	Quadrat 203	One point tip and four volcanic glass flakes.
10BT1640	Outside Quadrat 173	One volcanic glass Elko Corner-notched point.
10BT1643	Outside Quadrat 560	One Stemmed Indented-base point, volcanic glass.
10BT1645	Quadrat 606	One volcanic glass point fragment.
10BT1648	Quadrat 459	One volcanic glass preform.
10BT1649	Quadrat 459	One large corner-notched point fragment, volcanic glass.
10BT1650	Quadrat 459	One Elko-Eared point fragment, volcanic glass.
10BT1652	Quadrat 499	One volcanic glass biface midsection.
10BT1654	Quadrat 207	One volcanic glass biface fragment.
10BT1655	Quadrat 207	One purpled bottle neck, cork-stopped, with eight associated glass frags.
10BT1658	Quadrat 378	One silicate scraper fragment.
10BT1661	Quadrat 297	One large lanceolate point fragment, silicate.
10BT1663	Quadrat 297	One silicate biface fragment.
10BT1668	Quadrat 045	One rough out biface, volcanic glass.
10BT1669	Outside Quadrat 069	One large corner-notched point, volcanic glass.
10BT1674	Quadrat 401	One ignimbrite point midsection, seven flakes.
10BT1675	Quadrat 401	One large corner-notched point fragment, volcanic glass.

(Table 1 cont.)

10BT1680	Outside Quadrat 019	One silicate biface fragment.
10BT1681	Quadrat 019	One large corner-notched point (volcanic glass), one secondary silicate flake.
10BT1683	Quadrat 231	One volcanic glass biface fragment.
10BT1684	Quadrat 231	One large stemmed point fragment, volcanic glass.
10BT1686	Quadrat 691	Two volcanic glass biface fragments, one volcanic glass secondary flake.
10BT1689	Outside Quadrat 348	One silicate point frag.
10BT1691	Quadrat 348	One large volcanic glass biface fragment.

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Sites

Of the total number of resources identified in the sample quadrats, 39 have been designated as sites. These resources are considered to have the potential of providing additional information beyond the recording completed during this survey. All sites encountered during the 1990 NPR Archaeological Sample Survey have been recommended as potentially eligible to the National Register of Historic Places and therefore will require further investigation, initially in the form of test excavations, in order to assess this potential eligibility. In order to make this determination, 17 sites located during the NPR archaeological sample survey have been recommended for shovel testing. Shovel testing is usually recommended for those sites that appear to have only marginal soil depth and/or exhibit limited, short term prehistoric activity. 22 sites located during the sample survey have been recommended for formal testing due to the likelihood they will produce subsurface cultural material. The form of test excavation recommended is determined by the nature and quantity of the surface artifactual material as well as visible evidence of cultural features such as fire-cracked rock or faunal remains which may indicate the possibility of datable subsurface material. The following recommendations are based on rather intuitive assessments of site characteristics, and it should be noted that surface artifacts do not necessarily

CULTURAL CHRONOLOGY OF THE EASTERN SNAKE RIVER PLAIN

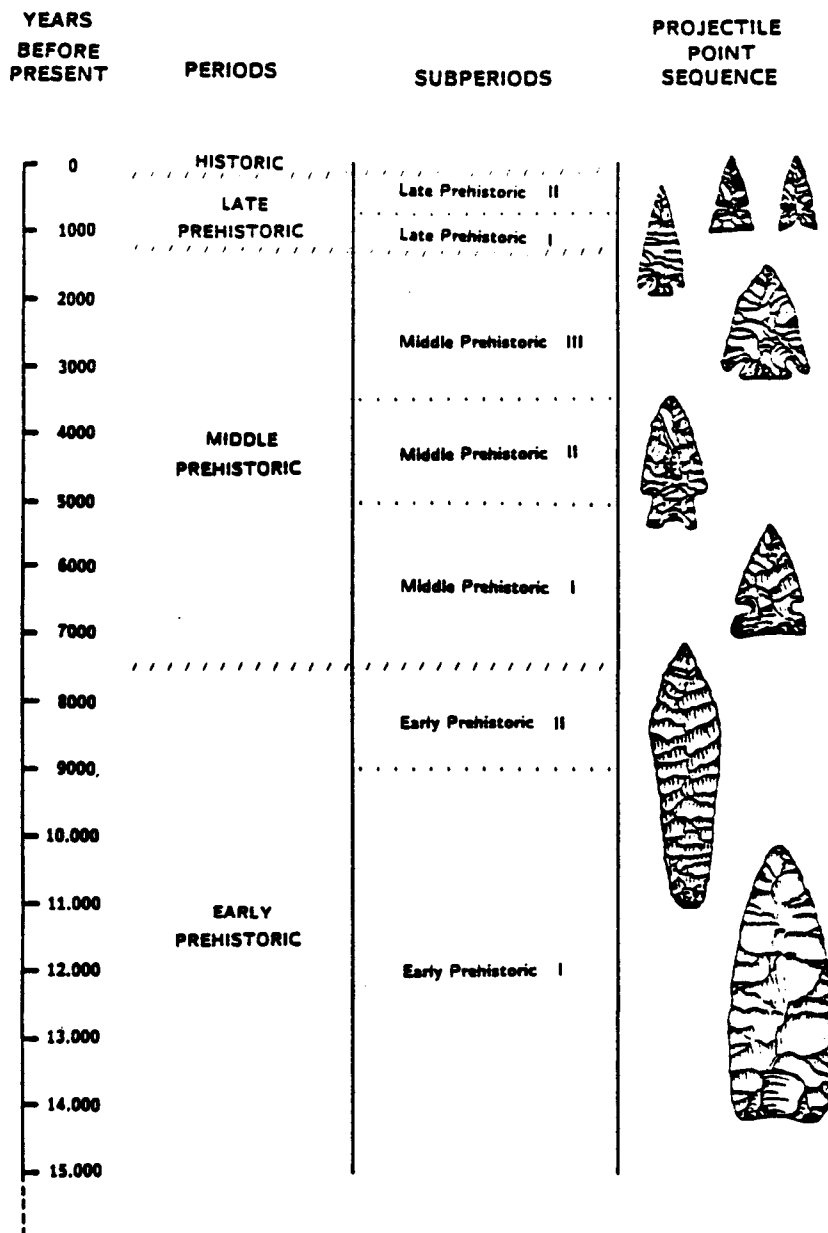


Figure 2. Generalized cultural chronology of the Eastern Snake River Plain.

reflect subsurface components. Therefore, test excavation procedures may be subject to change following further investigation or review. For those sites where surface diagnostics were recovered, a period of occupation has been assigned based on the general cultural chronology (Figure 2) developed for the Eastern Snake River Plain (Ringe 1990). However, it should be noted that earlier or later occupations may also be present at the site but not represented by surface diagnostics.

Sites Recommended for Shovel Testing:

10BM265

Location: Quadrat 723

Impact Agents: None

Period of Occupation: Late Prehistoric

The site is a small, sparse lithic scatter located along the base of a ridgeline bordering a small embayment (Figure 3). Most of the debitage is tertiary volcanic glass, however, some primary and secondary flakes are present. Several silicate flakes were also noted. The only tool located was an Avonlea projectile point (Figure 4). No faunal remains or cultural features were visible.

While only short-term prehistoric activity is indicated on the surface of the site, buried cultural materials may be present. Therefore, it is recommended that the site be shovel tested.

10BM267

Location: Quadrat 728

Impact Agents: Mild Erosion

Period of Occupation: General Prehistoric

The site is a small, low density lithic scatter located on the southern slope of an east-west trending pressure ridge (Figure 5). The debitage consists of six secondary volcanic glass and silicate flakes. Three tools were found, including one point tip, a point midsection, and a preform. One fragment of fire-cracked quartzite was noted but no cultural features were visible on the ground surface.

Only short-term activity is represented on the ground surface, however, the presence of fire-cracked rock may indicate a buried cultural feature. Therefore, it is recommended that the site be shovel tested.

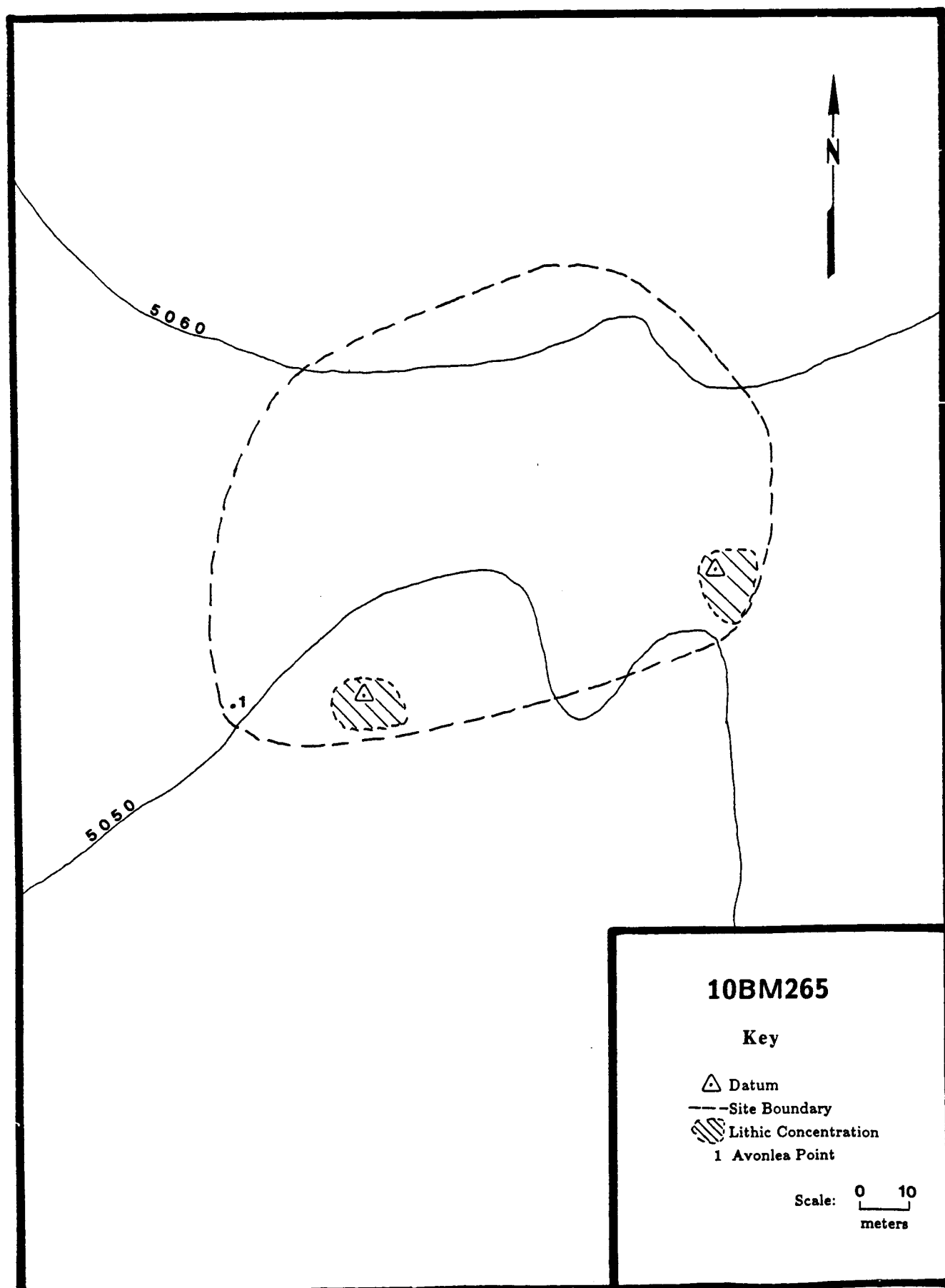


Figure 3. Planimetric map of site 10BM265.



A

Figure 4. Collected artifacts from 10BM265: A) 10BM265-1.

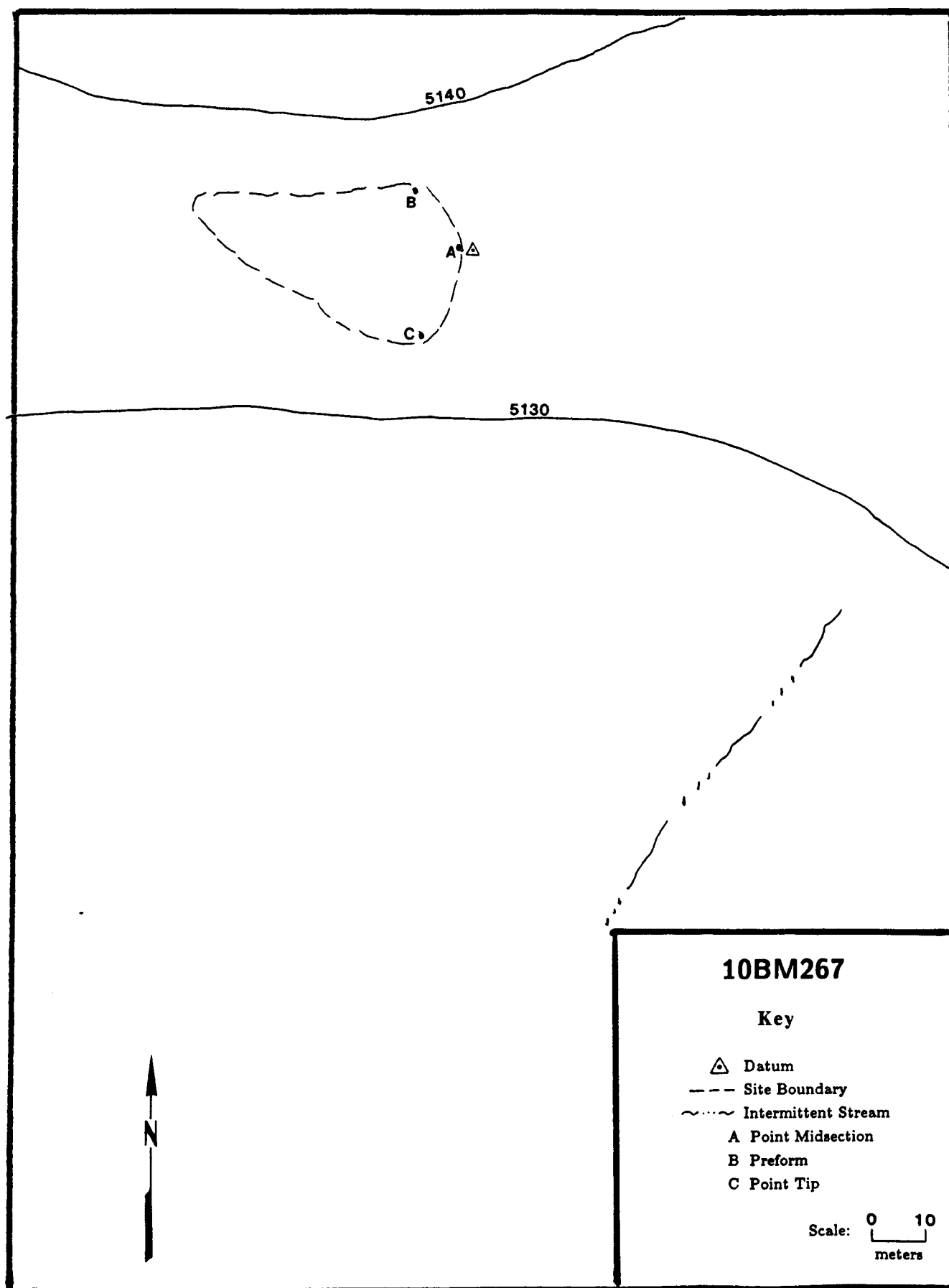


Figure 5. Planimetric map of site 10BM267.

10BT1641

Location: Quadrat 090

Impact Agents: Mild Erosion

Period of Occupation: General Prehistoric

The site is a low density lithic scatter located in an embayment walled by basalt pressure ridges to the east, west and south (see Figure 6). The debitage assemblage is predominately secondary volcanic glass flakes. A volcanic glass scraper was the only tool encountered. A possible cairn (Figure 7) is situated on a basalt rise northeast of the site.

Cultural materials may be present in accreting aeolian deposits. Therefore, it is recommended that the site be shovel tested.

10BT1642

Location: Quadrat 090

Impact Agents: Erosion, Deflation

Period of Occupation: General Prehistoric

Site is a low density lithic scatter located on a low basalt exposure or outcrop in a broad basin (Figure 8). The scatter consists of seven volcanic glass secondary and tertiary flakes. One large lanceolate point base was the only tool encountered (Figure 9). No faunal remains or cultural features were visible.

The site is recommended for shovel testing. Soil depth is probably quite shallow.

10BT1646

Location: Quadrat 606

Impact Agents: Vandalism

Period of Occupation: General Prehistoric

The site is a light density, dispersed lithic scatter situated on the gentle east slope of a broad pressure ridge (Figure 10). All reduction stages are represented in the debitage, however, primary decortication volcanic glass flakes make up the dominant portion of the assemblage. A large number of expedient tools were located (retouched and utilized flakes), as well as one biface, one scraper and one exhausted volcanic glass core. Small clusters or "piles" of artifacts noted within the site boundaries indicate previous illegal surface collection. No faunal remains were noted on the ground surface.

Due to actively accreting aeolian deposits, it is recommended that the site be shovel tested in order to determine its eligibility to the NRHP.

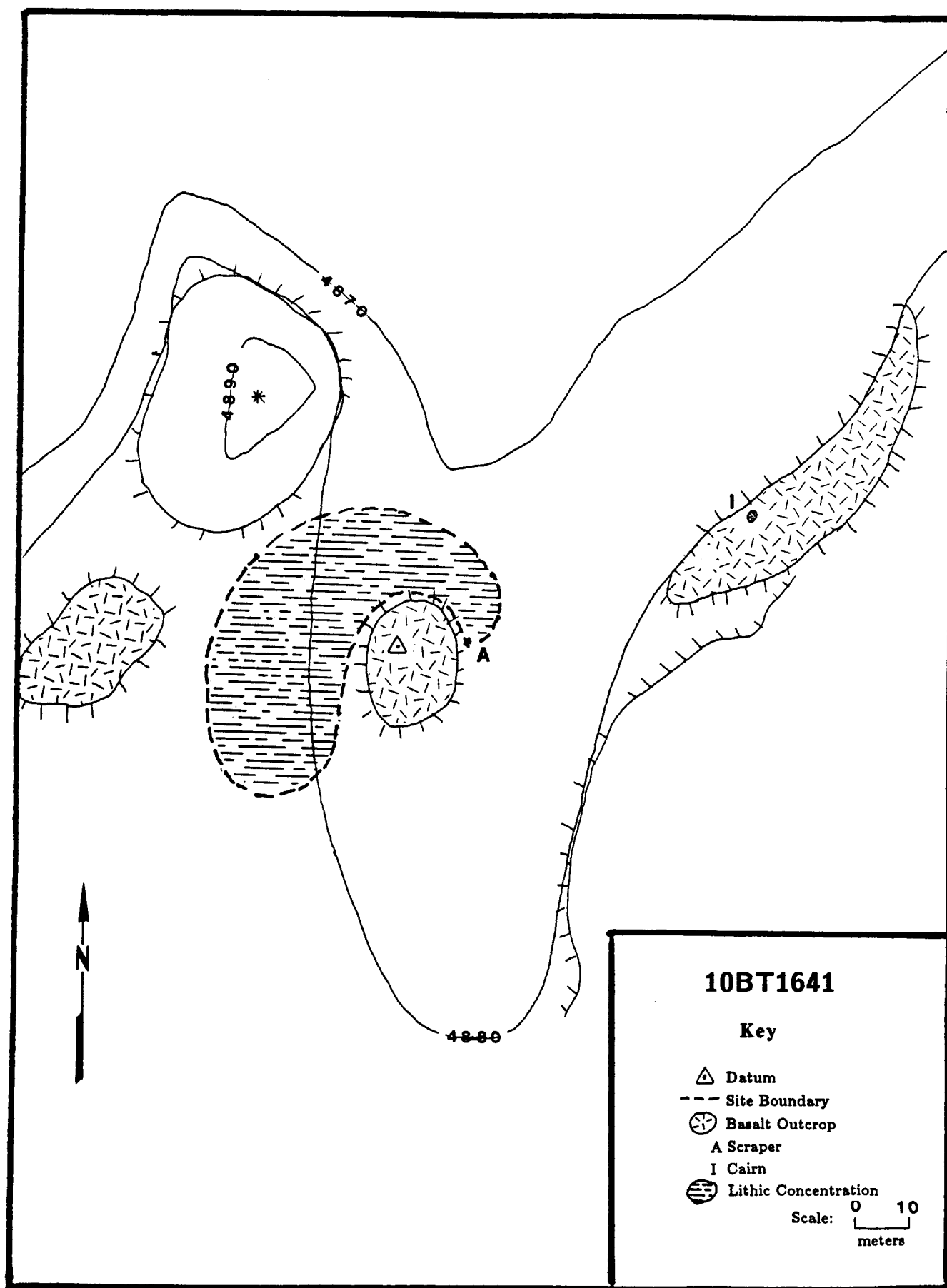


Figure 6. Planimetric map of site 10BT1641.

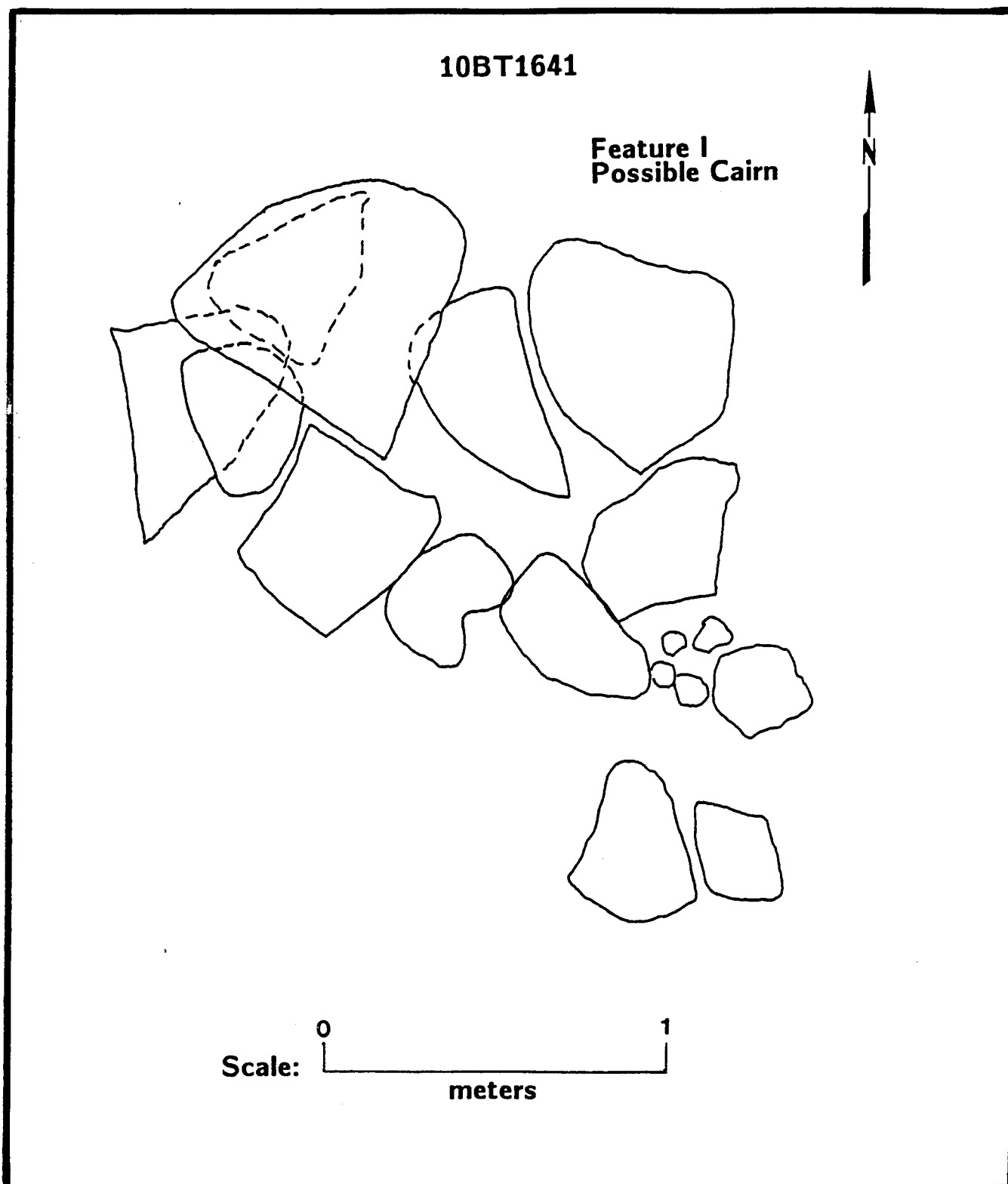


Figure 7. Planimetric map of 10BT1641 stone-feature.

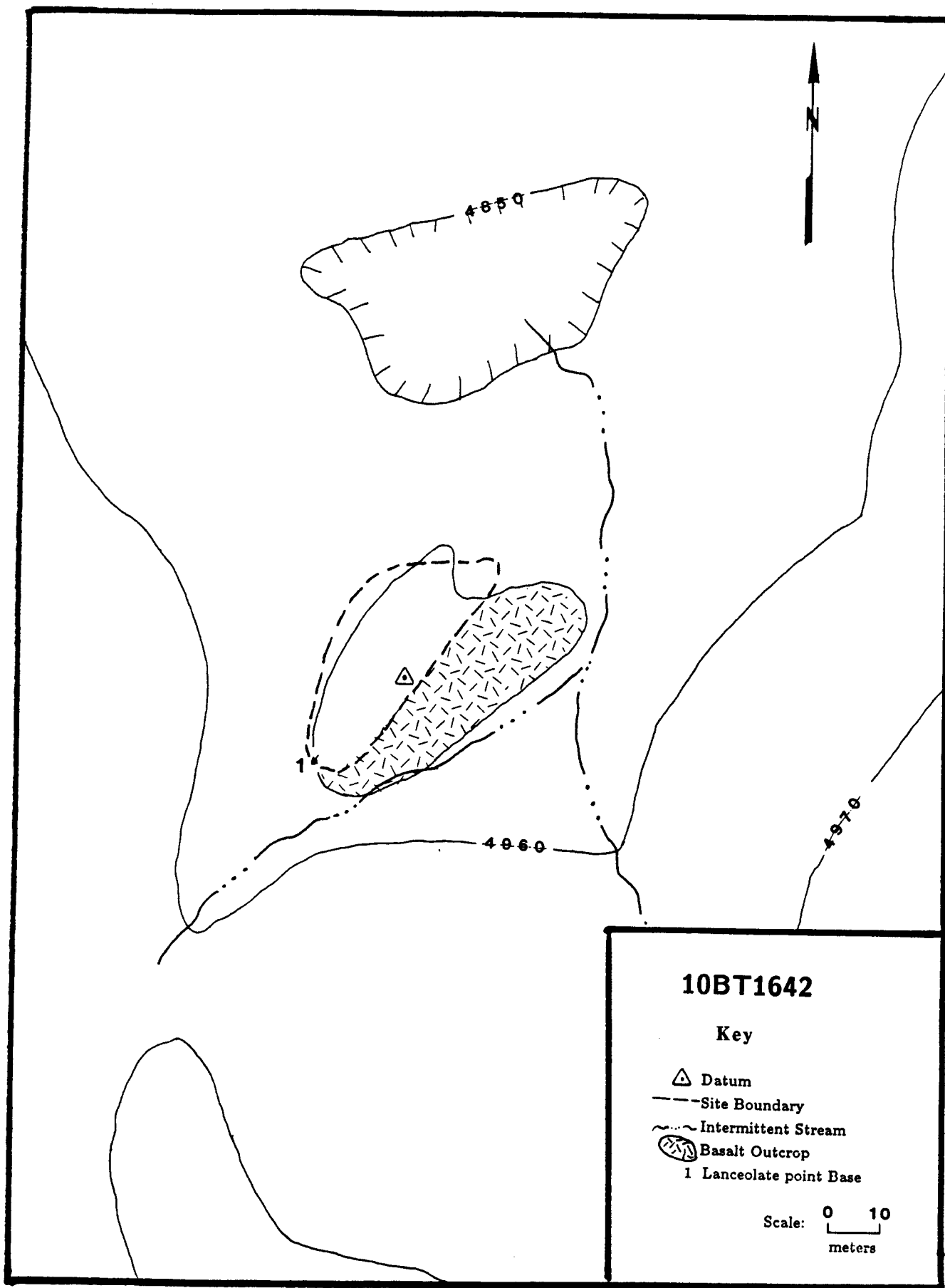


Figure 8. Planimetric map of site 10BT1642.



A

Figure 9. Collected artifacts from 10BT1642: A) 10BT1642-1.

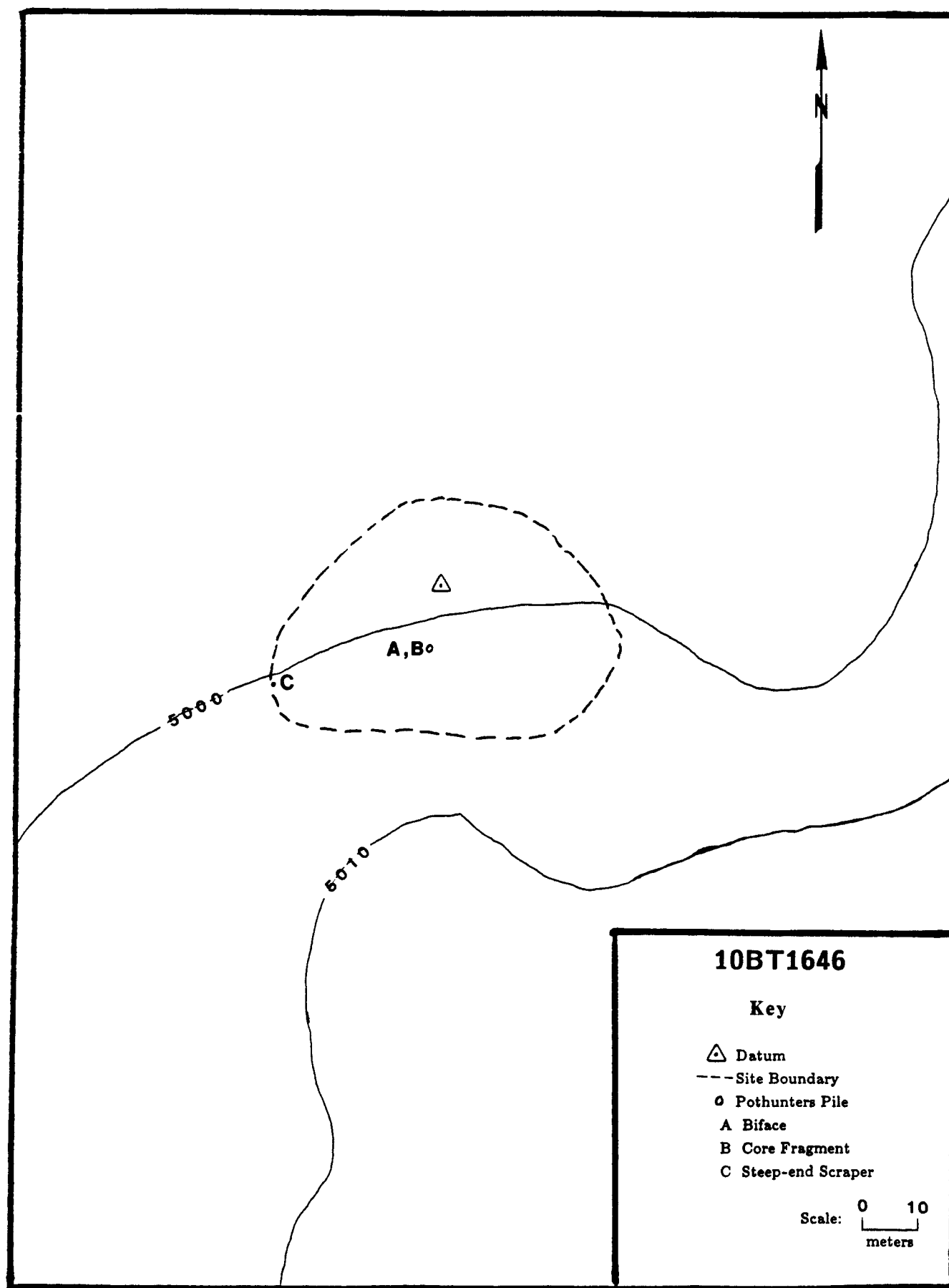


Figure 10. Planimetric map of site 10BT1646.

10BT1647

Location: Quadrat 459

Impact Agents: Mild Rodent Burrowing

Period of Occupation: General Prehistoric

This site is a light density lithic scatter located in a low area within a basin surrounded by basalt pressure ridges (Figure 11). The debitage consists of volcanic glass secondary and tertiary flakes. Several point fragments, a biface and a scraper were the only tools encountered.

It is recommended that the site be shovel tested due to its location in active aeolian deposits.

10BT1651

Location: Quadrat 459

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a small lithic scatter located at the base of a ridge on the western edge of a depression (Figure 12). All of the debitage is tertiary volcanic glass. No tools, diagnostics or features were noted, indicating that perhaps only stone tool maintenance occurred at this location.

It is recommended that the site be shovel tested due to its location in active aeolian deposits. Buried cultural material may be present.

10BT1657

Location: Quadrat 378

Impact Agents: None

Period of Occupation: Middle Prehistoric III

The site is a light density lithic scatter located on the south slope of a pressure ridge overlooking a basin (Figure 13). The debitage was primarily secondary and tertiary volcanic glass waste flakes. The only tools found in association with the scatter included a scraper, a biface fragment and one Besant Side-notched point (Figure 14). The debitage appeared to be randomly dispersed and no evidence of cultural features was present.

It is recommended that the site be shovel tested in order to determine the extent of the cultural deposits.

10BT1662

Location: Quadrat 297

Impact Agents: Mild Erosion

Period of Occupation: General Prehistoric

The site is a moderately dense lithic and bone scatter located on a flat, basalt exposure or pan (Figure 15) that appears to hold rainwater periodically. The debitage, consisting primarily of volcanic glass secondary and tertiary flakes, was evenly distributed throughout the site. Small burned bone

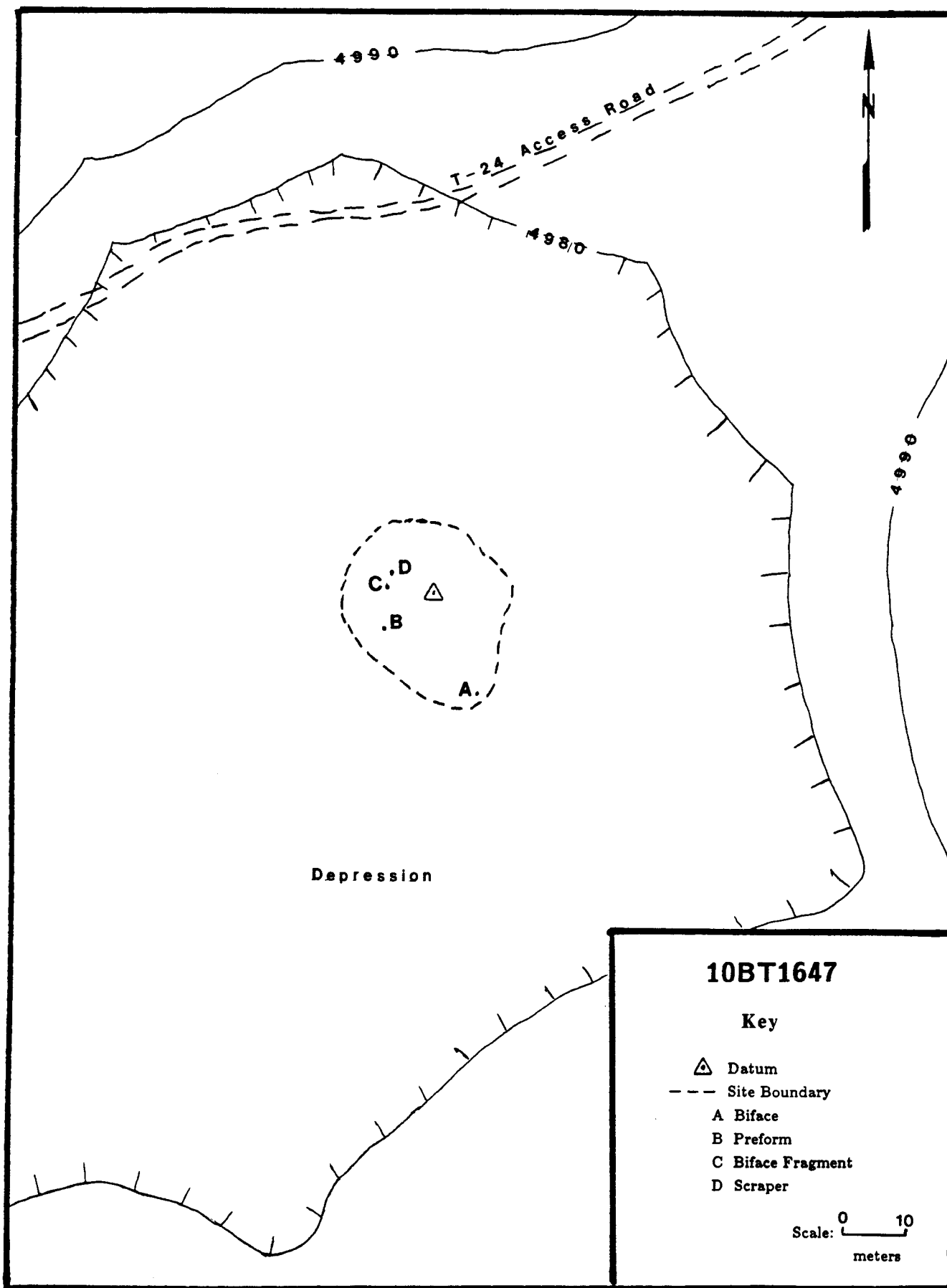


Figure 11. Planimetric map of site 10BT1647.

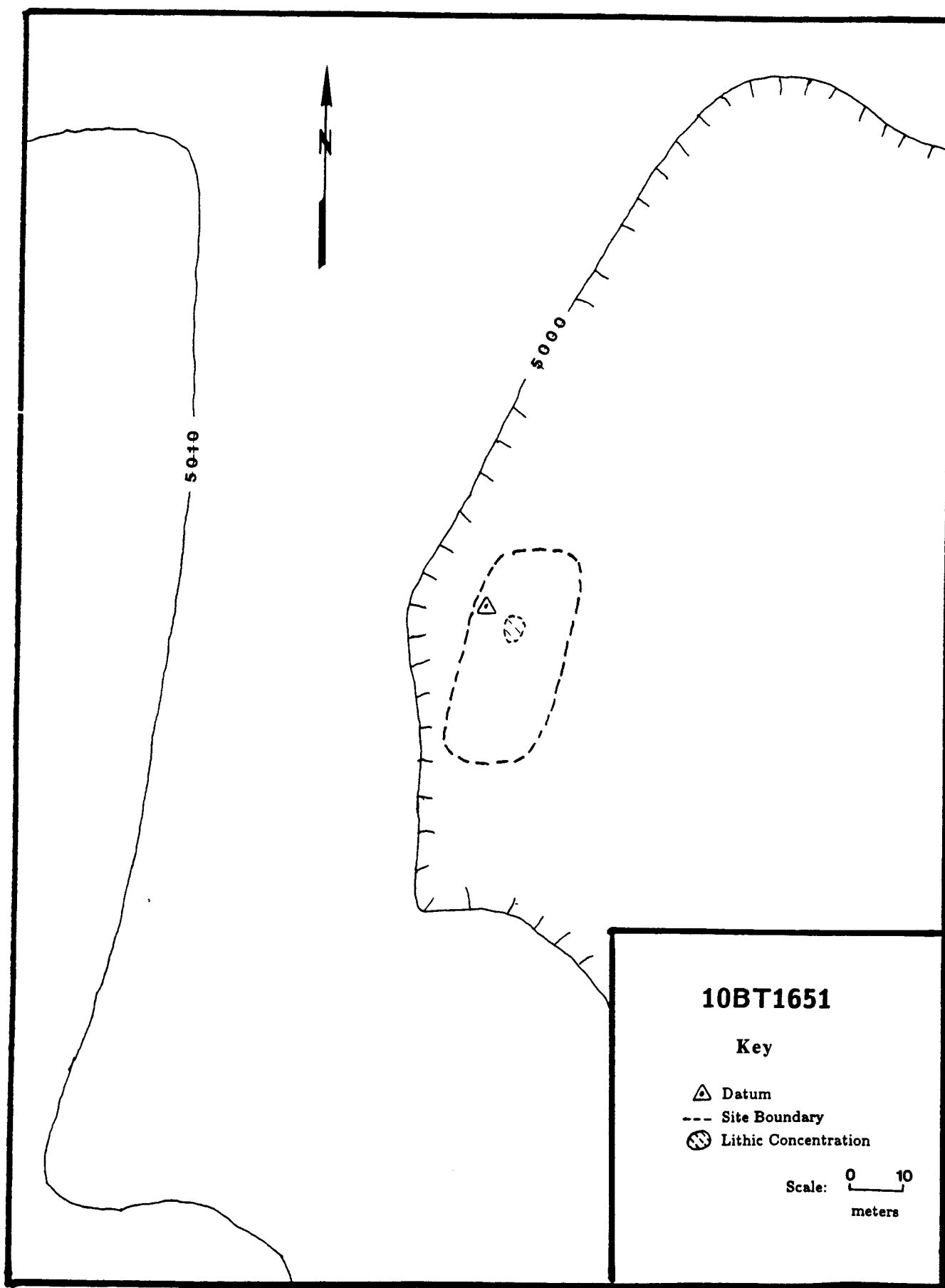


Figure 12. Planimetric map of site 10BT1651.

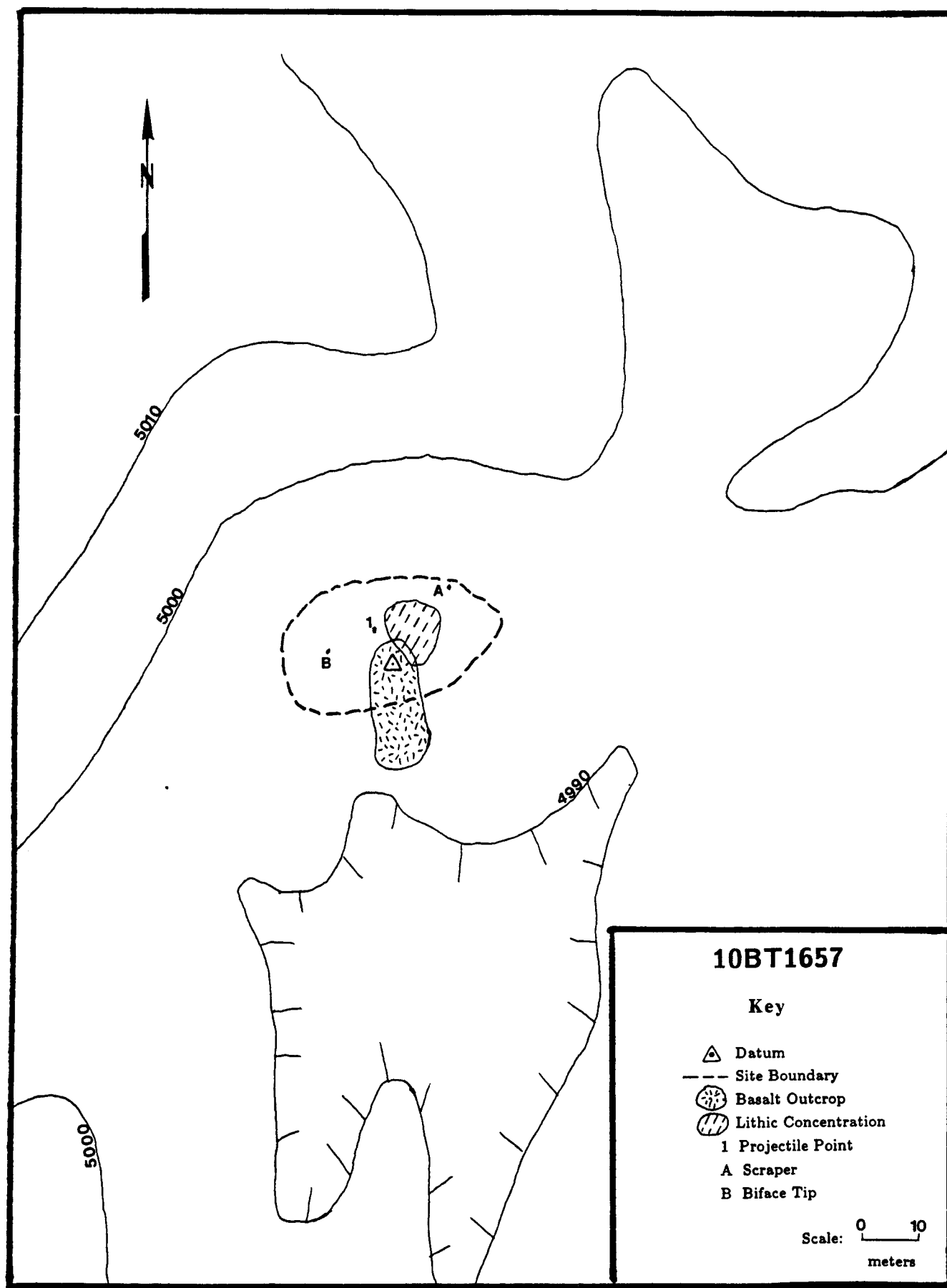


Figure 13. Planimetric map of site 10BT1657.



Figure 14. Artifacts collected from site 10BT1657; A) 10BT1657-1.

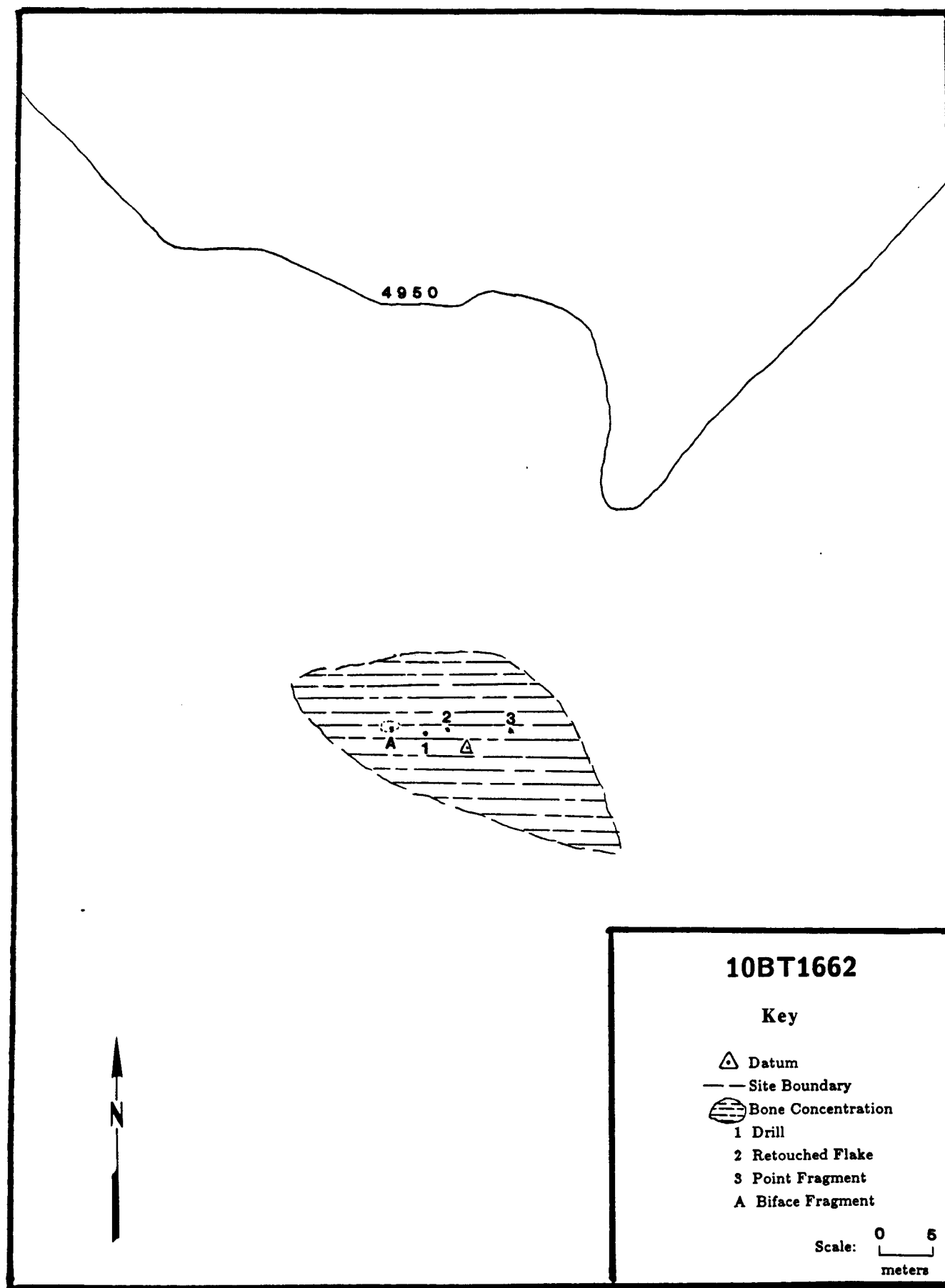


Figure 15. Planimetric map of site 19BT1662.

fragments and tooth enamel were concentrated on the site's northern edge. A projectile point fragment, biface, drill and retouched flake (Figure 16) were found in association with the scatter.

While the nature of the surface activity indicates the possibility of buried cultural materials, it should be noted that the soils on-site are very shallow. Shovel testing will be adequate in determining the site's eligibility to the NRHP.

10BT1664

Location: Quadrat 301

Impact Agents: Mild Erosion

Period of Occupation: General Prehistoric

The site is a sparse, randomly dispersed lithic and bone scatter surrounding a small ephemeral pond on the west side of a low ridge (see Figure 17). The lithic debitage was primarily tertiary volcanic glass, however, silicate and basalt flakes were also present. A small concentration of bone fragments, artiodactyl tooth enamel and waste flakes was located on northern edge of the site. Two biface fragments were found in association with the scatter.

Soil deposition on and surrounding the ephemeral pond appears to be marginal, therefore, shovel tests will be sufficient for determining if subsurface cultural deposits are present.

10BT1665

Location: Quadrat 352

Impact Agents: None

Period of Occupation: General Prehistoric

The site consists of a small scatter of silicate and volcanic glass tertiary debitage located in a north-south trending swale between pressure ridges (Figure 18). No tools or cultural features were evident.

Due to the actively accreting aeolian deposits, the site should be shovel tested in order to determine whether subsurface cultural materials are present.

10BT1671

Location: Quadrat 510

Impact Agents: Mild Erosion

Period of Occupation: Middle and Late Archaic

The site is a small lithic scatter located on the slope of a low pressure ridge overlooking a gentle depression to the south (Figure 19). The debitage was sparse and no distinct concentrations were noted. One Humboldt Concave-base projectile point and two large corner-notched points (Figure 20) were the only tools found in association. No faunal remains or evidence of cultural features were visible.



A



B

Figure 16. Artifacts collected from 10BT1662: A) 10BT1662-1, B) 10BT1662-3.

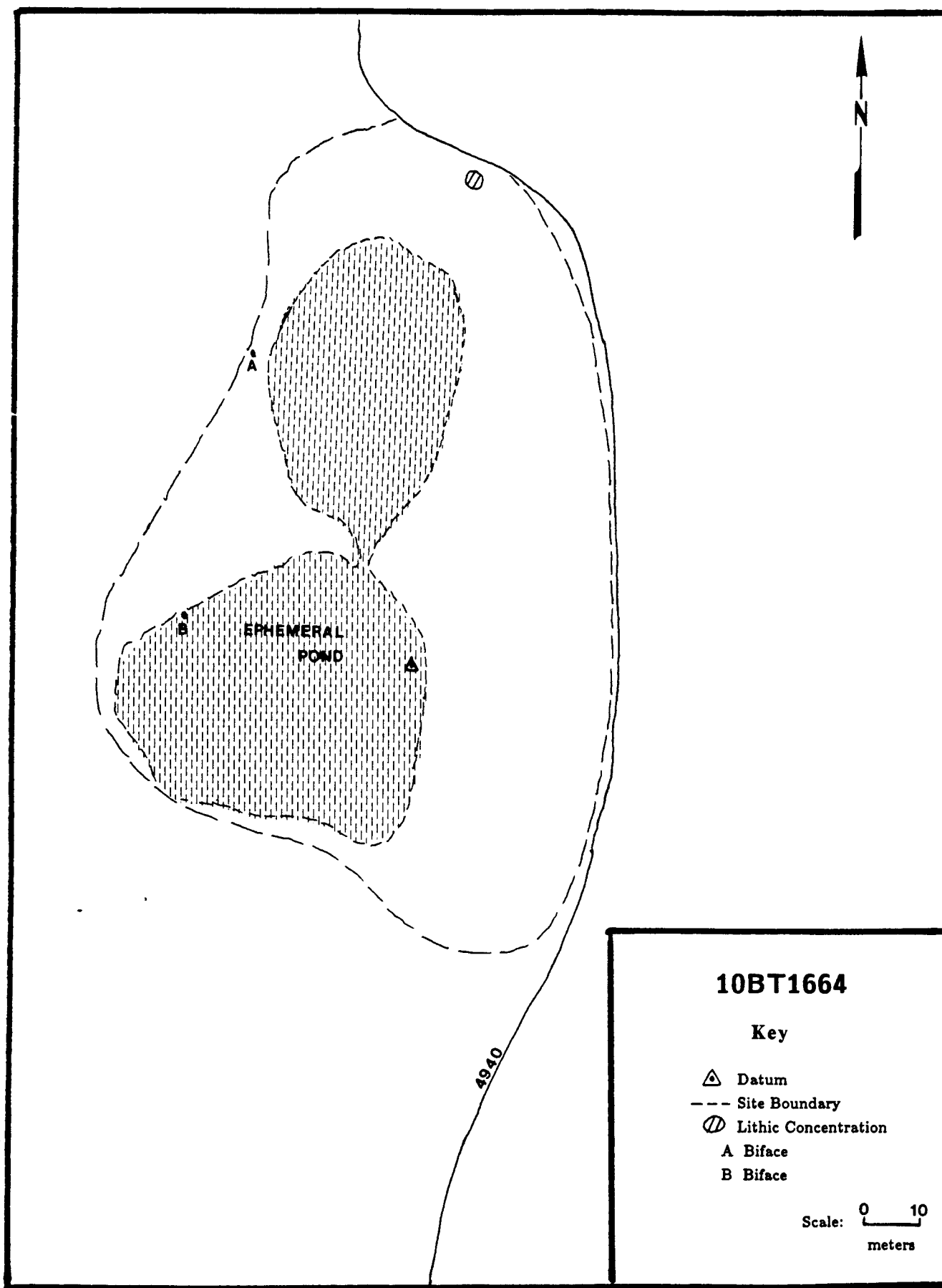


Figure 17. Planimetric map of site 10BT1664.

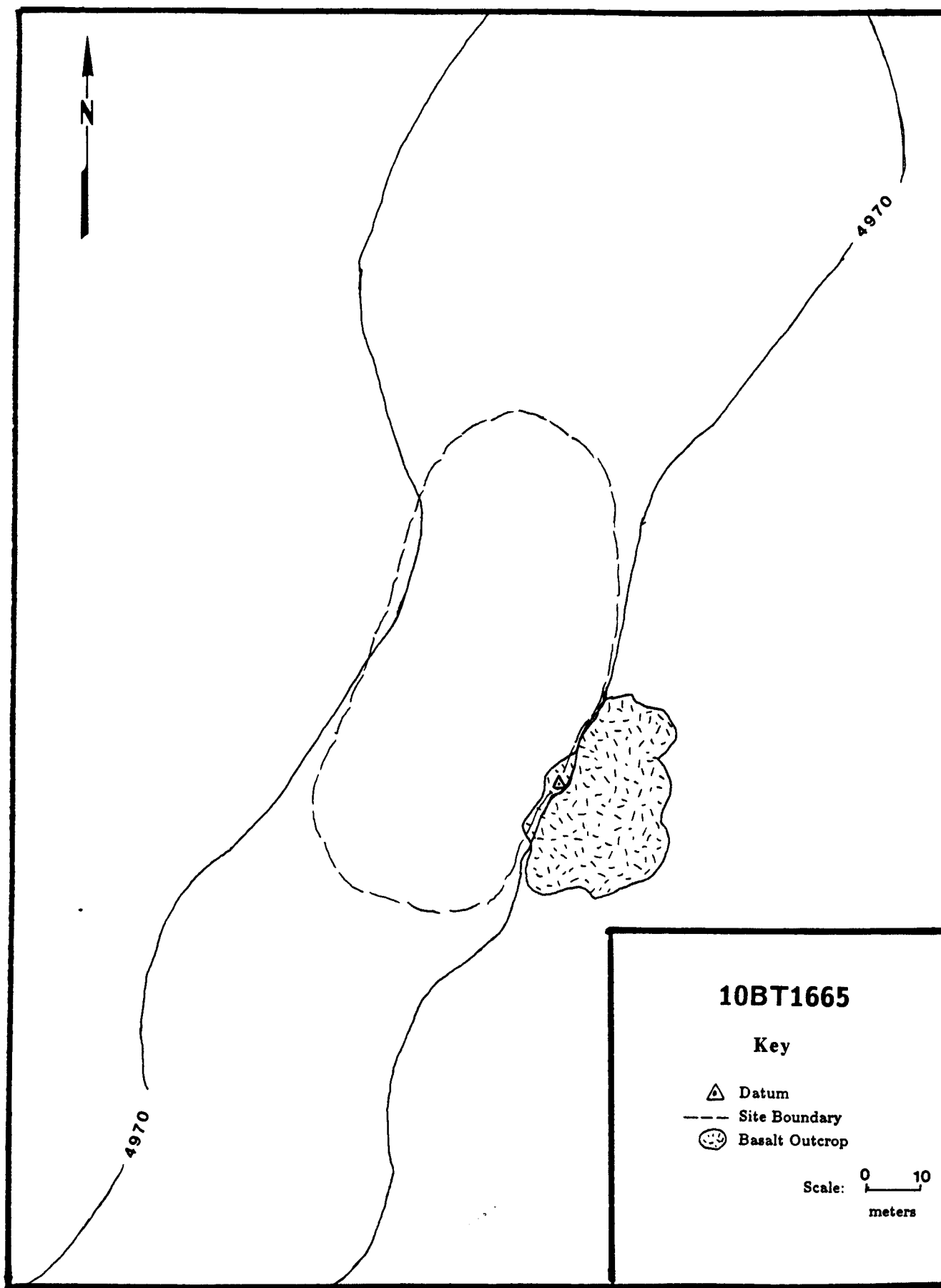


Figure 18. Planimetric map of site 10BT1665.

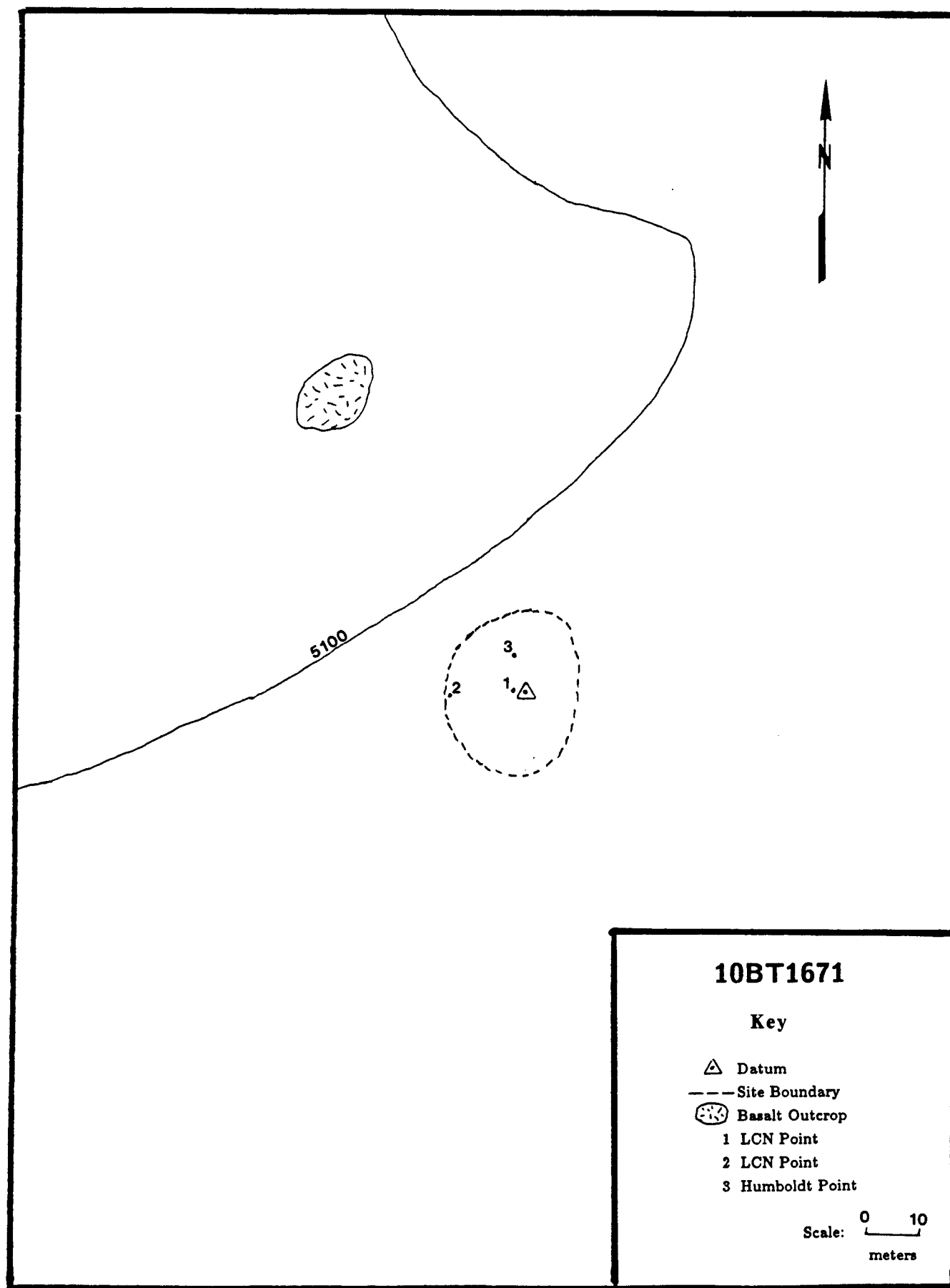


Figure 19. Planimetric map of site 10BT1671.



A



B



C

Figure 20. Artifacts collected from 10BT1671: A) 10BT1671-1, B) 10BT1671-2, C) 10BT1671-3.

The site is situated in actively accreting aeolian deposits. Therefore, it is recommended that the site be shovel tested.

10BT1673

Location: Quadrat 401

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a low density lithic scatter located in sandy deposits on the south facing slope of a pressure ridge (Figure 21). The debitage consisted of sparsely scattered primary and secondary volcanic glass waste flakes. Tools found in association included one biface tip and one steep-end scraper (Figure 22). Two fire-cracked basalt fragments were located however no cultural features were visible. No faunal remains were noted.

The surface artifact assemblage represents only limited prehistoric activity, however buried cultural material may be present in active geologic deposits. Therefore, the site should be shovel tested.

10BT1678

Location: Quadrat 019

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a low density lithic scatter of roughly 25 waste flakes situated in a small, shallow basin between basalt outcrops (Figure 23). The debitage, made up of primarily secondary volcanic glass, was widely dispersed with no visible concentrations. No tools, faunal remains or evidence of cultural features were noted.

The area exhibits active accumulation of sand, therefore, it is recommended that the site be shovel tested in order to determine if subsurface cultural material is present.

10BT1679

Location: Quadrat 019

Impact Agents: None

Period of Occupation: Early Prehistoric II, Late Prehistoric I

The site is a low density lithic scatter located on the northern edge of a small playa (Figure 24). Volcanic glass secondary flakes make up the majority of the debitage, however, silicate materials are also present. One Rosegate Corner-notched point and one Haskett lanceolate point base (Figure 25) were the only tools encountered on the site. Small fragments of artiodactyl tooth enamel were noted, but no concentrations were visible.

It is recommended that the site should be shovel tested. The soils on-site are probably quite shallow due to their proximity with the deflated playa.

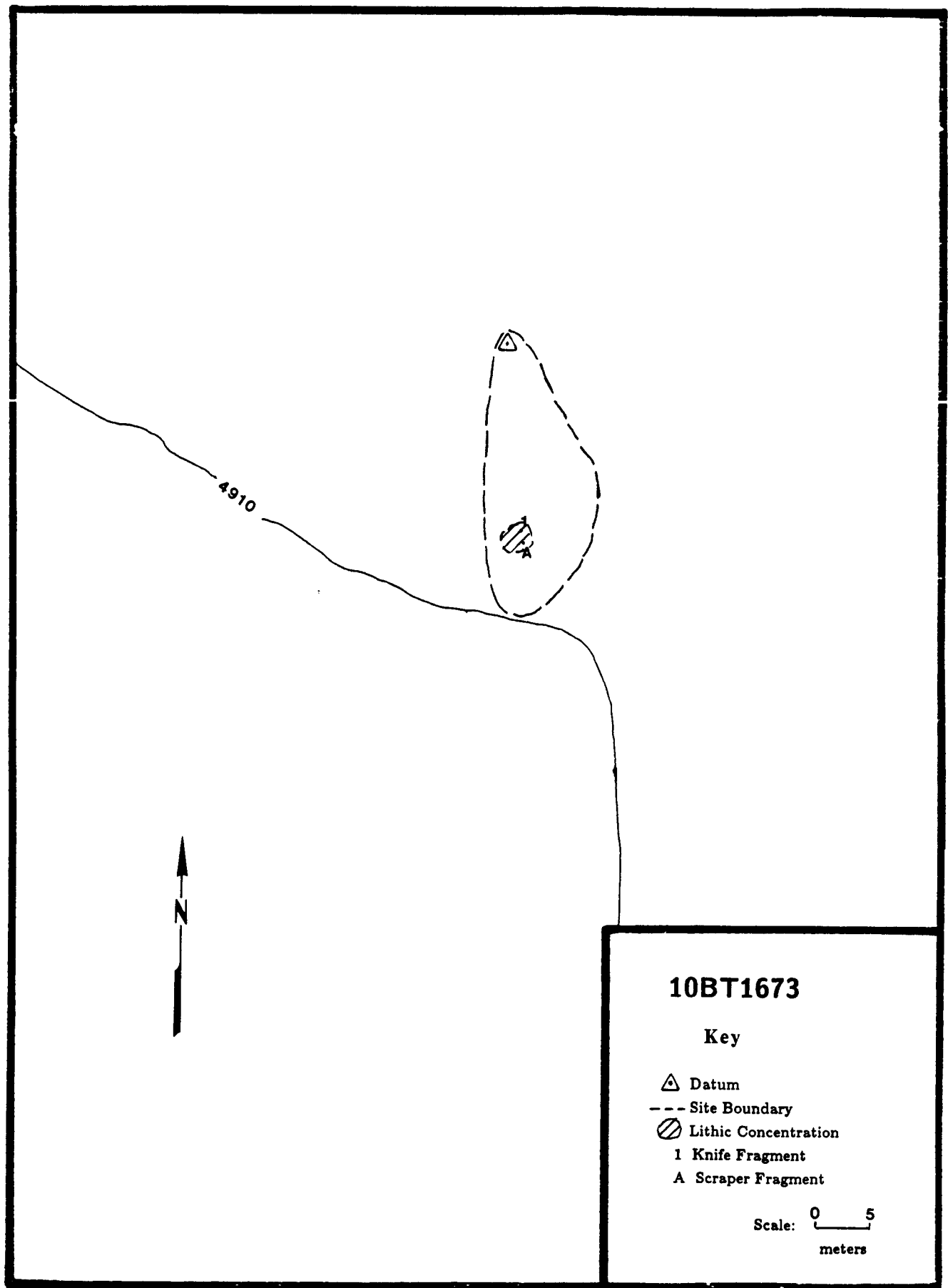


Figure 21. Planimetric map of site 10BT1673.



Figure 22. Artifact collected from 10BT1673: A) 10BT1673-1.

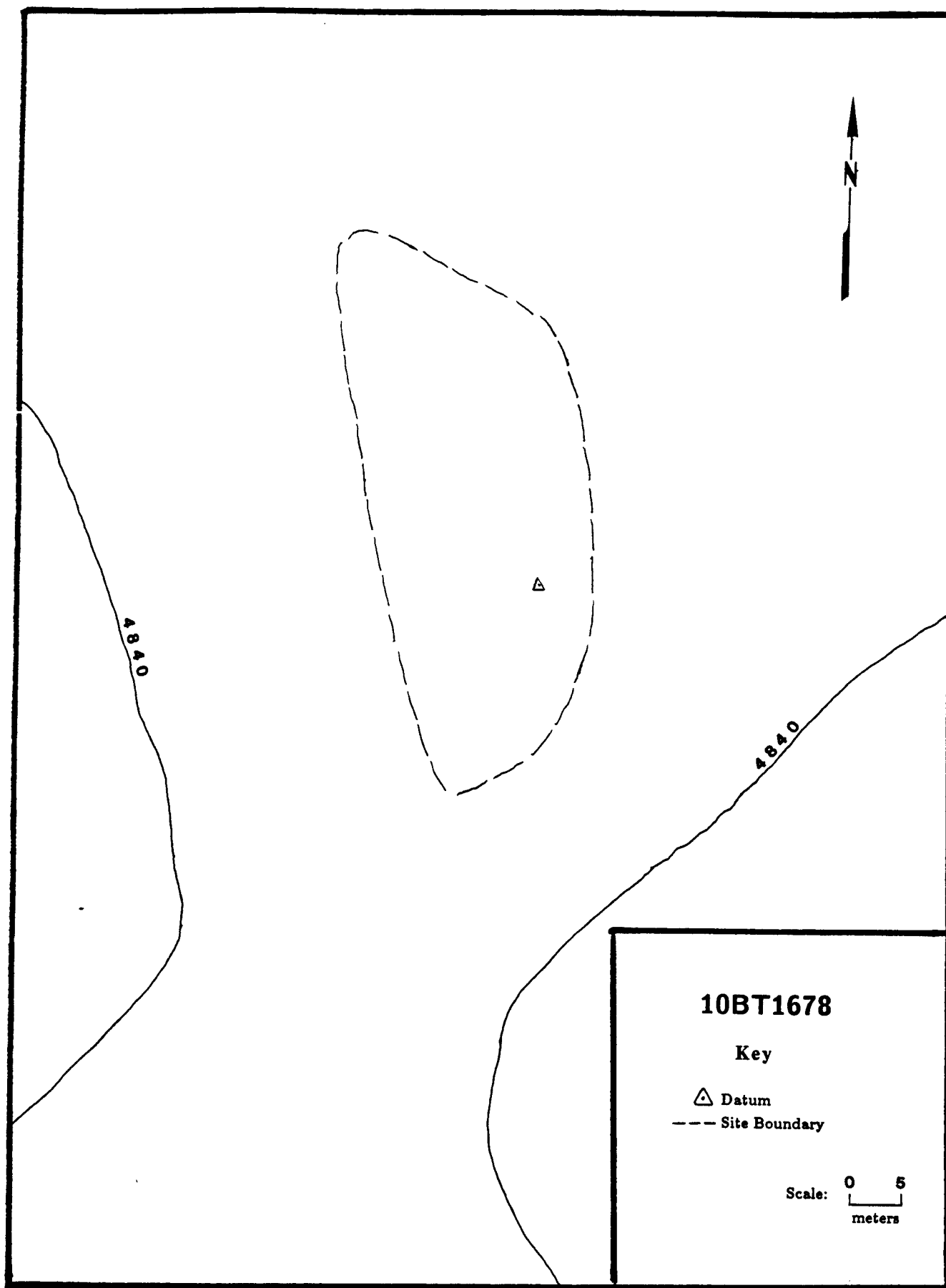


Figure 23. Planimetric map of site 10BT1678.

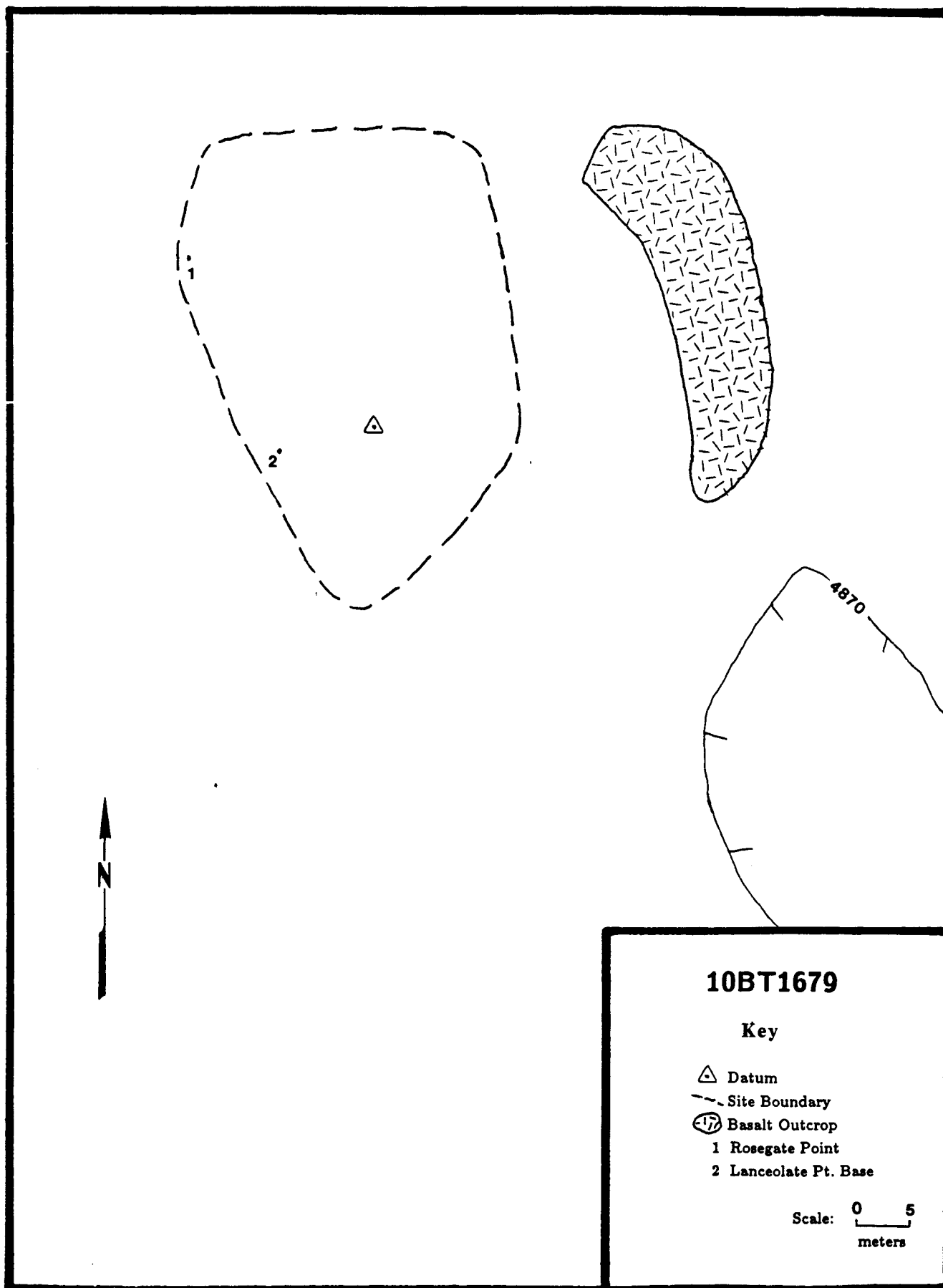


Figure 24. Planimetric map of site 10BT1679.



A



B

Figure 25. Artifacts collected from 10BT1679: A) 10BT1679-1, B) 10BT1679-2.

10BT1682

Location: Quadrat 019

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a small, high density lithic scatter located in an open flat area west of a basin (Figure 26). The debitage assemblage consisted primarily of primary and secondary volcanic glass flakes. Some silicates were also present. No tools, cultural features or faunal remains were located.

While only short term prehistoric activity is represented on the ground surface, sandy deposits present on-site indicate the possibility of buried cultural material. Therefore, the site should be shovel tested.

10BT1685

Location: Quadrat 691

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a low density lithic scatter of volcanic glass waste flakes situated in a shallow saddle between two low basalt outcrops (Figure 27). All lithic reduction stages were noted, however secondary flakes were dominant. One shattered basalt projectile point fragment was the only tool found in association with the scatter. No faunal remains or cultural features were visible.

Due to the site's location in active aeolian deposits, it is recommended that shovel testing be performed in order to determine if subsurface cultural deposits are present.

Sites Recommended for Formal Testing:

10BM263

Location: Quadrat 723

Impact Agents: Mild Erosion

Period of Occupation: Middle Prehistoric III

The site is a light density lithic scatter located along an intermittent drainage on the southern side of a pressure ridge (Figure 28). All reduction stages are present, however secondary flakes are the most abundant. Material types present include volcanic glass, silicates and basalt. Several possible Wahmuza lanceolate points were encountered (Figure 29) along with a few expedient tools.

The presence of soil depth may provide datable subsurface cultural features associated with the diagnostics located on the ground surface, therefore, it is recommended that the site be formally tested.

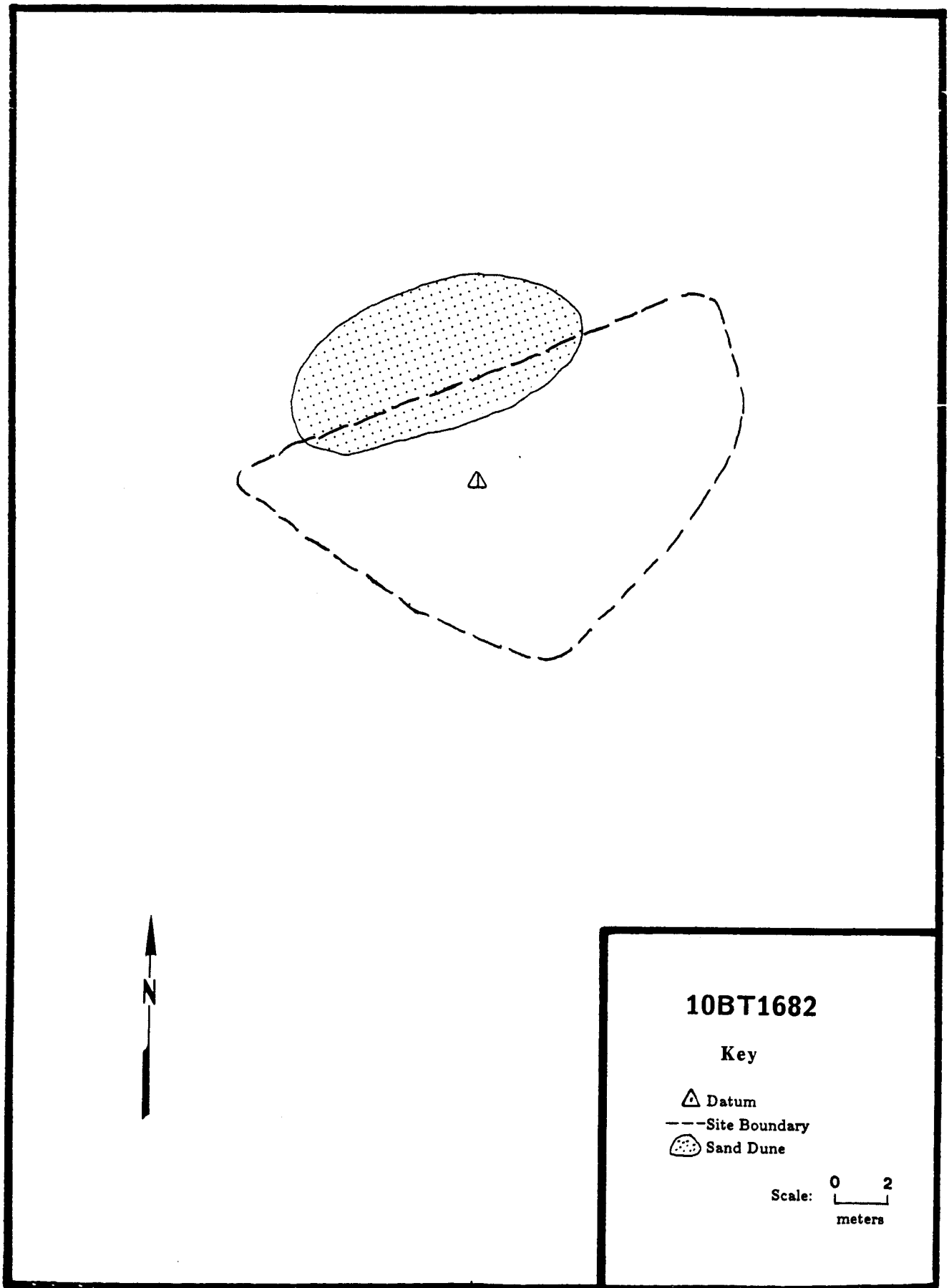


Figure 26. Planimetric map of site 10BT1682.

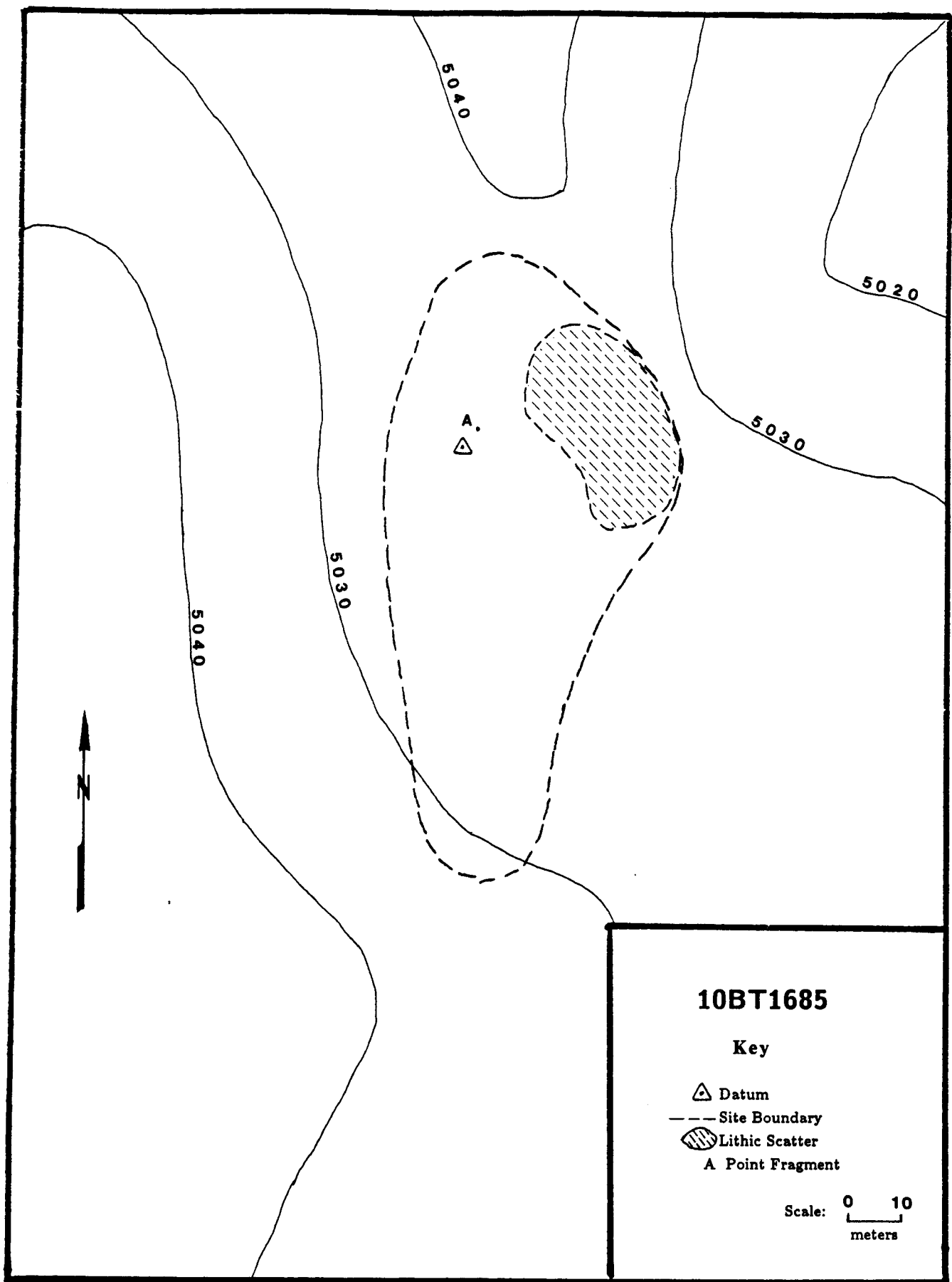


Figure 27. Planimetric map of site 10BT1685.

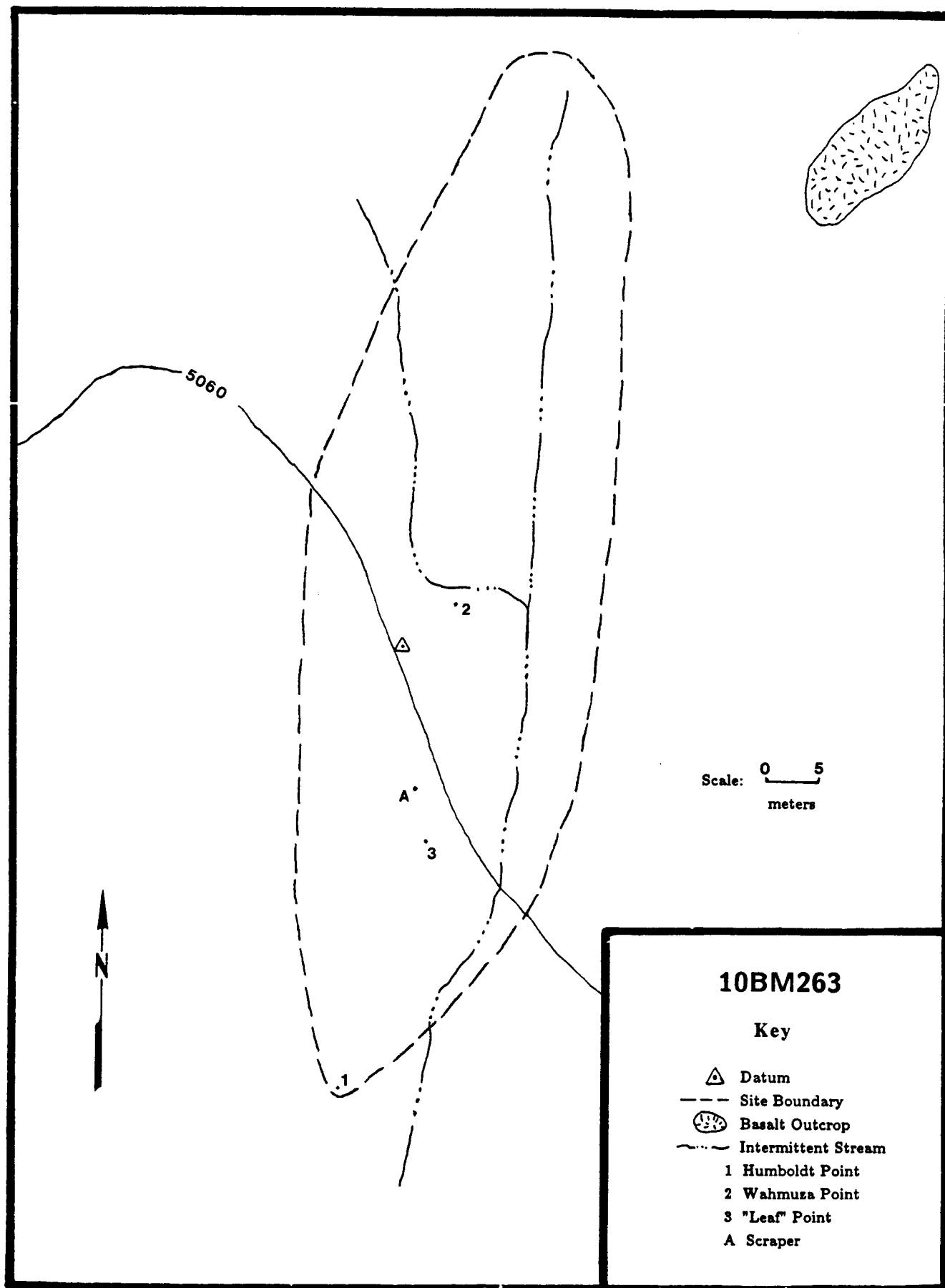


Figure 28. Planimetric map of site 10BM263.



A



B



C

Figure 29. Artifacts collected from 10BM263: A) 10BM263-1, B) 10BM263-2, C) 10BM263-3.

10BM264

Location: Quadrat 723

Impact Agents: Mild Erosion

Period of Occupation: Late Prehistoric

The site is a small lithic, ceramic and bone scatter located on the southern slope of a east-west trending pressure ridge (Figure 30). The lithics consist of primarily tertiary volcanic glass flakes with a few silicates. One biface fragment and one utilized flake were the only tools located. A total of 20 pot sherds were found in four small separate concentrations (see Figure 31). These appear to be of the brown/gray Intermountain Ware variety. The bone scatter consists of a small number of artiodactyl tooth enamel and burned long bone fragments.

It is recommended that the site be formally tested. Accreting deposits with the presence of bone fragments and ceramics may indicate possible subsurface cultural features.

10BM275

Location: East of Quadrat 728

Impact Agents: Erosion

Period of Occupation: Middle Prehistoric III

The site is a light density lithic scatter located on the southern slope of a pressure ridge with a small drainage running through its eastern portion (Figure 32). Secondary volcanic glass flakes are dominant in the assemblage. The majority of the debitage is clustered near the drainage. One Elko Corner-notched point (Figure 33) and several bifaces were located. A stone feature, which consists of 27 basalt cobbles forming pile one meter in diameter, is situated on the eastern side of the drainage. Its function is unknown.

Because subsurface cultural materials may be present in the actively accreting soils on site, it is recommended that the site be formally tested in order to determine its eligibility to the NRHP.

10BT1638

Location: Quadrat 203

Impact Agents: Mild Rodent Burrowing

Period of Occupation: General Prehistoric

The site is an extremely low density, highly dispersed lithic scatter of volcanic glass secondary flakes located in a sandy embayment surrounded by low pressure ridges (Figure 34). Two biface fragments and a scraper were the only tools noted. Three distinct concentrations of faunal remains (artiodactyl tooth enamel and small bone fragments), located in the central portions of the site, may be indicative of a game processing area. A possible hunting blind (Figure 35) is situated on a prominent basalt knob northeast of the embayment.

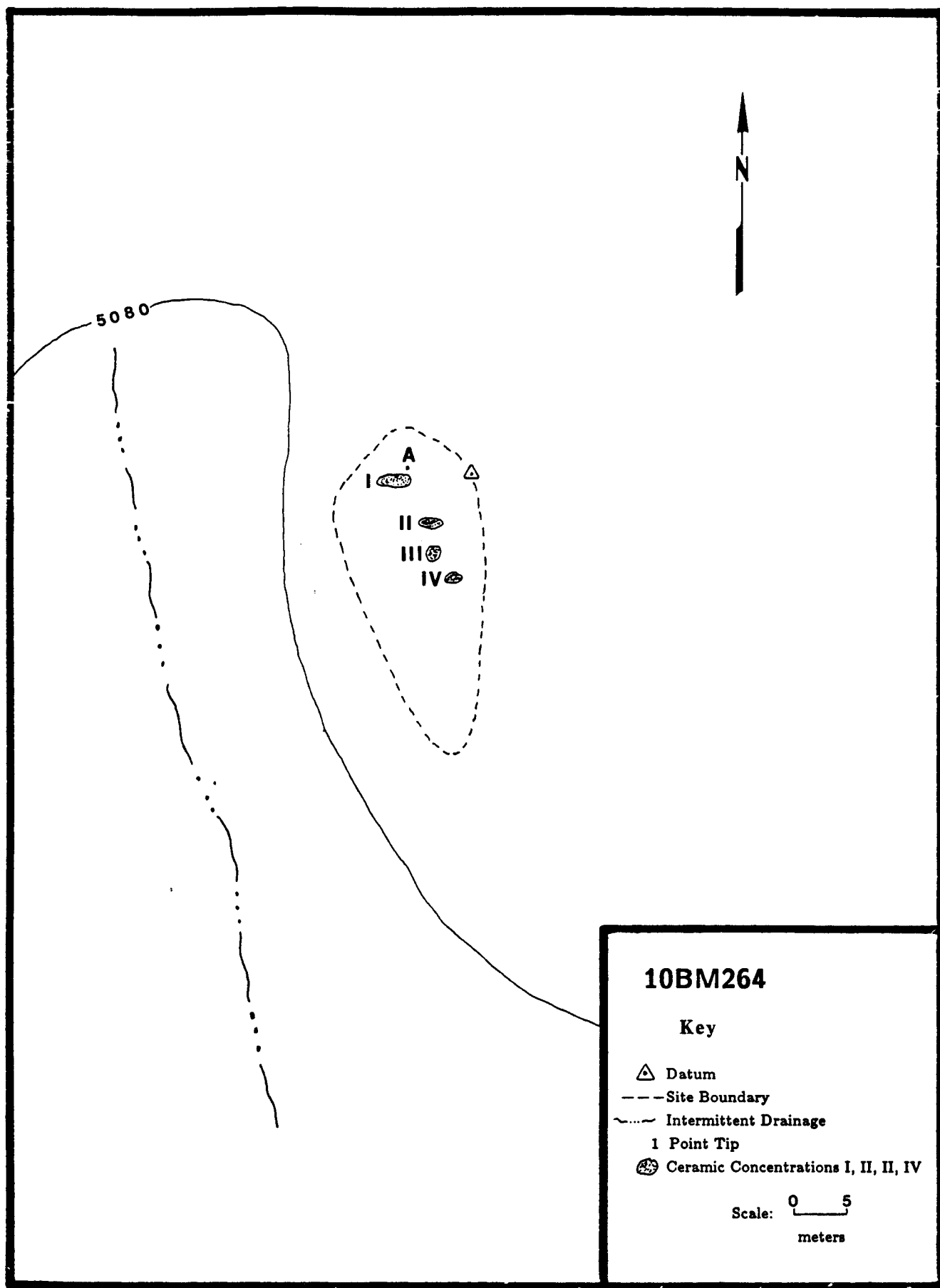


Figure 30. Planimetric map of site 10BM264.

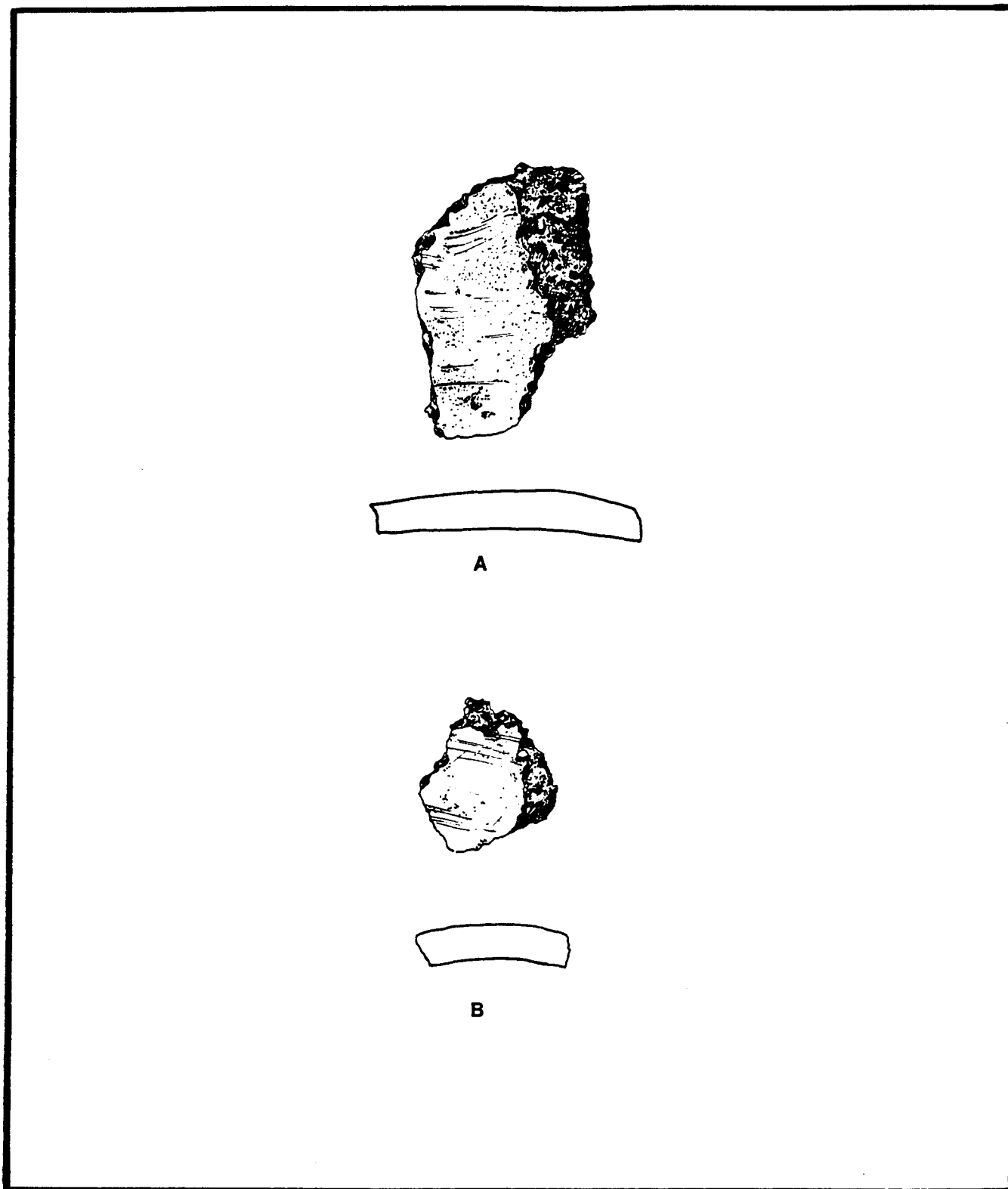


Figure 31. Ceramic artifacts collected from 10BM264: A) 10BM264-8 , B) 10BM264-15.

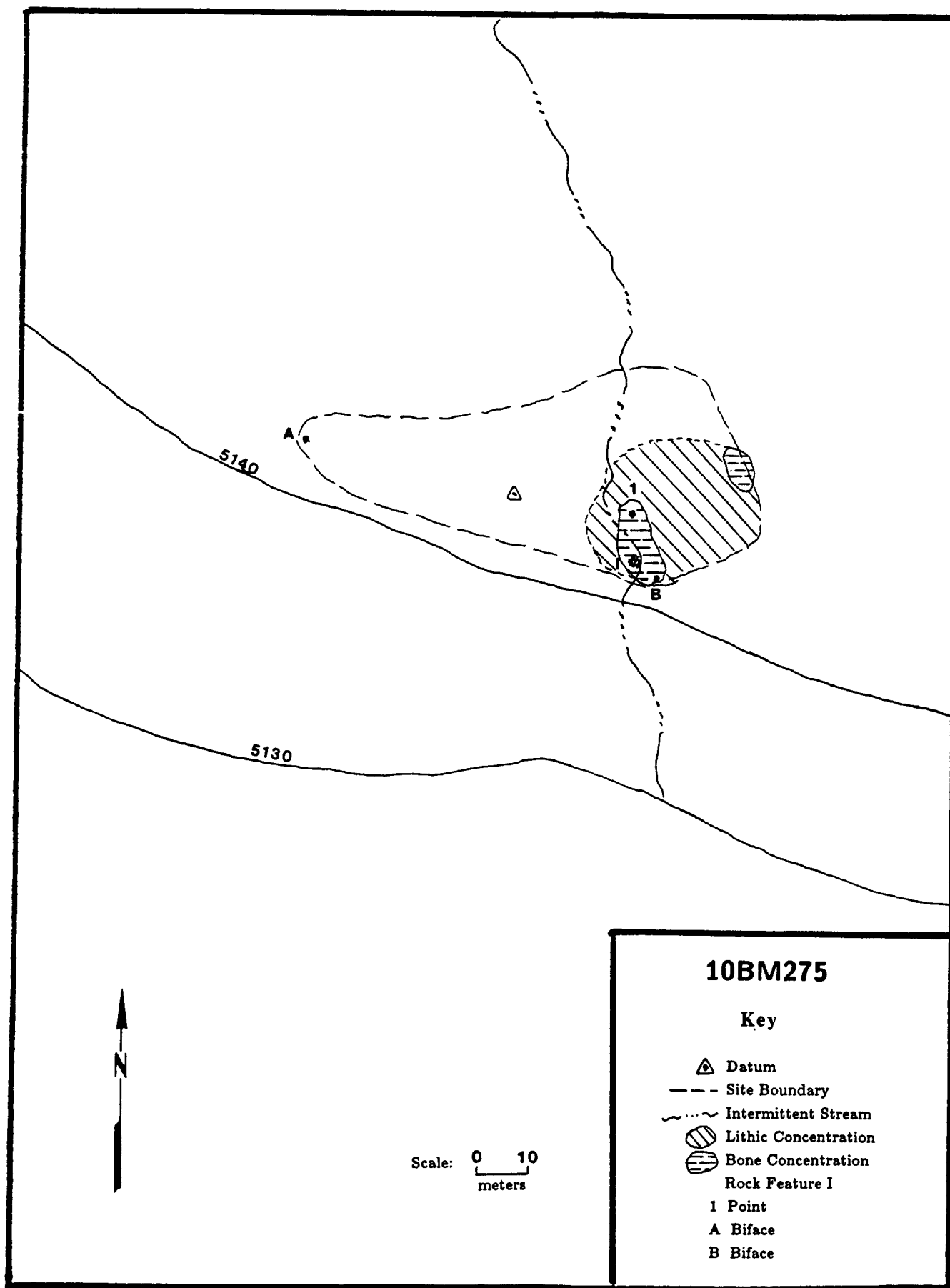


Figure 32. Planimetric map of site 10BM275.



A

Figure 33. Artifact collected from 10BM275: A) 10BM275-1.

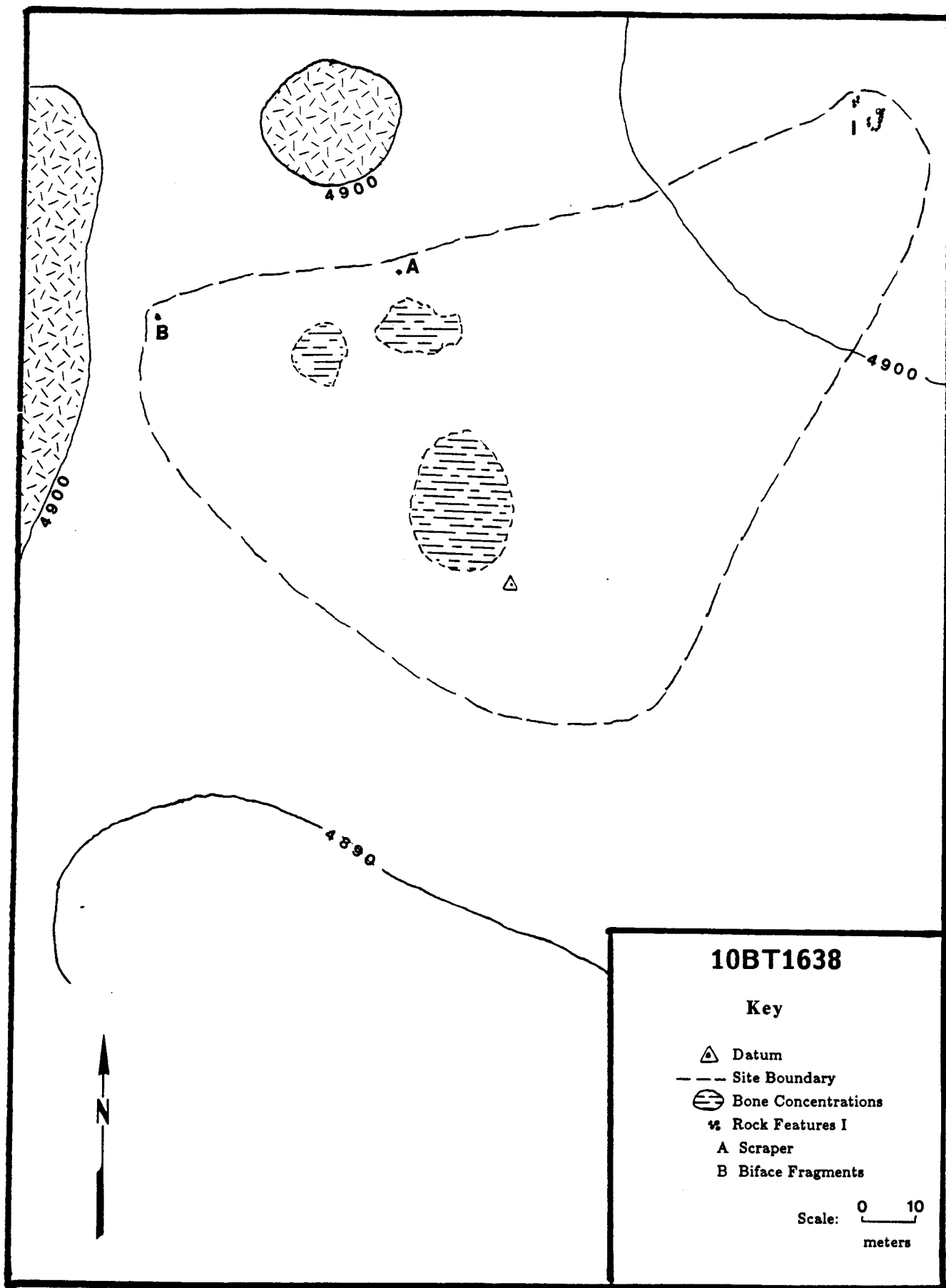


Figure 34. Planimetric map of site 10BT1638.

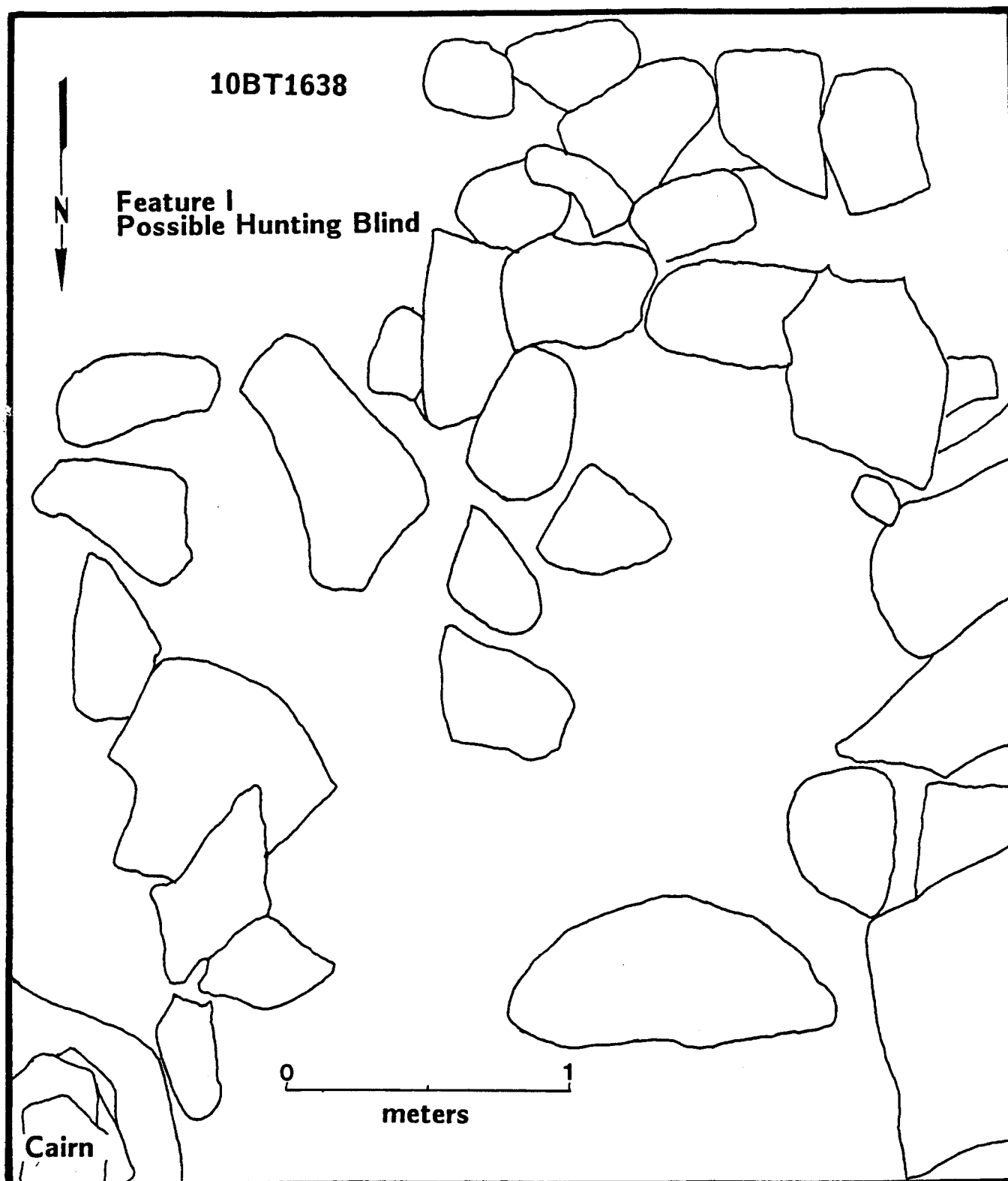


Figure 35. Planimetric map of 10BT1638 stone feature.

While the surface lithics suggest only limited activity, the faunal remains and accreting sand deposits in the embayment may indicate buried cultural materials on the site. Therefore, it is recommended that the site be formally tested in order to determine its eligibility to the NRHP. The possible hunting blind must be preserved for later research.

10BT1639

Location: Quadrat 203

Impact Agents: None

Period of Occupation: General Prehistoric

The site consists of an isolated semi-circular hunting blind located on the western slope of a long basalt pressure ridge (see Figure 36). A broad embayment is situated to the west. No other cultural artifacts were found in association.

It is recommended that the feature be considered eligible to the NRHP for future research purposes.

10BT1644

Location: Quadrat 560

Impact Agents: Road, Development

Period of Occupation: General Prehistoric

The site is a light density lithic scatter situated at the base of a low basalt ridge (Figure 37). An intermittent drainage runs through the eastern portion of the site. The scatter is made up of primarily volcanic glass secondary flakes. One point midsection was located. Tooth enamel and small bone fragments are sparsely scattered throughout the northern half of the site. A dirt road, as well as an expanse of dynamited basalt waste (see Figure 37), have probably impacted the cultural deposits.

Although the site has been previously impacted, the presence of accreting aeolian deposits in association with artifactual faunal remains may indicate buried cultural material, therefore, it is recommended that the site be formally tested.

10BT1653

Location: Quadrat 207

Impact Agents: None

Period of Occupation: Late Prehistoric I

The site is a moderately dense lithic scatter located in a shallow depression (Figure 38). Silicate and volcanic glass secondary and tertiary debitage is equally dispersed throughout the site. A large number of biface fragments and expedient tools were noted as well as one knife fragment and a Rosegate Corner-notched point (Figure 39). The large number of tool fragments, tooth enamel, burned bone fragments, fire-cracked rock, and ground stone fragments suggest that the site was used as a short-term camp or game processing site.

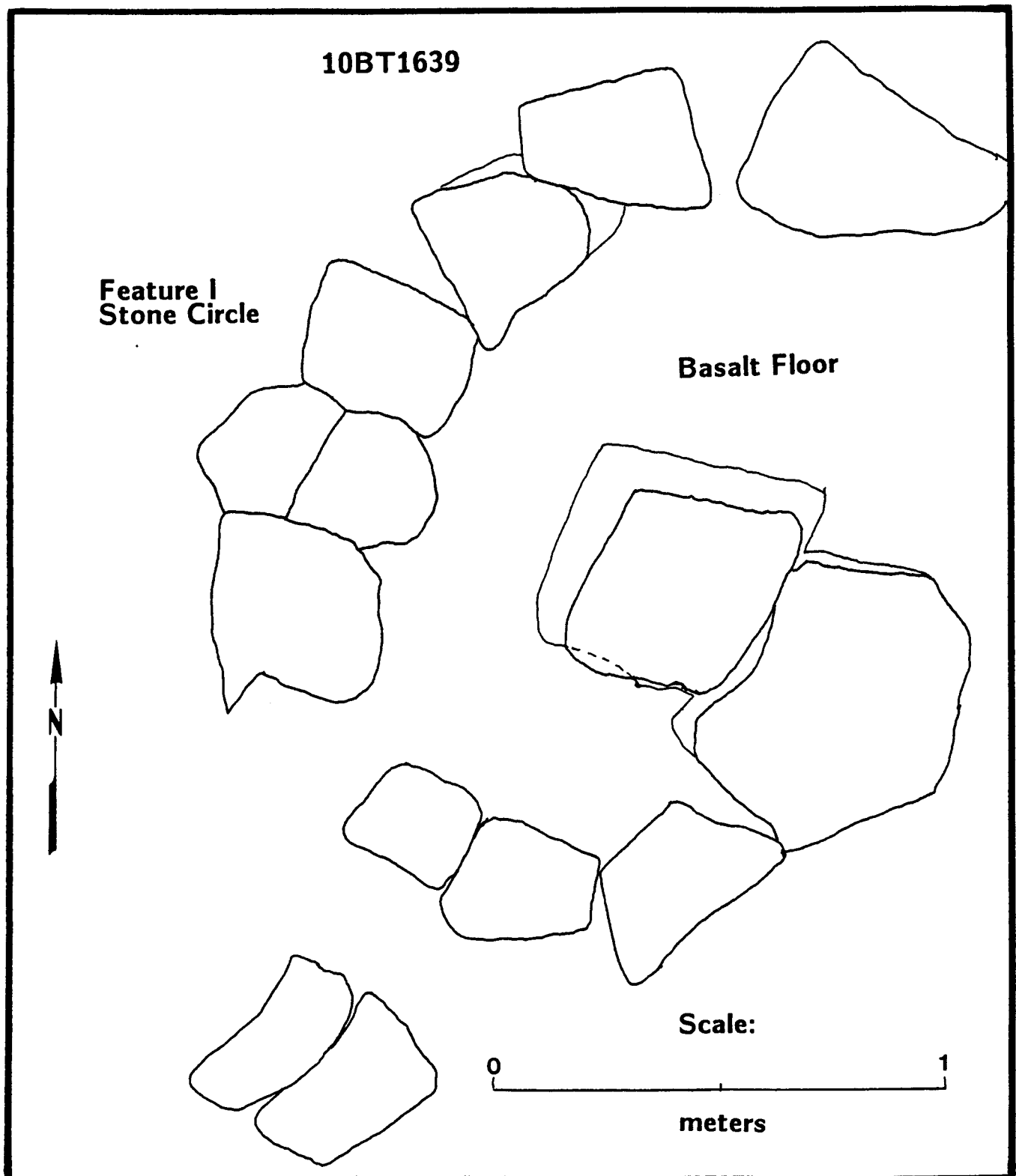


Figure 36. Planimetric map of 10BT1639 stone feature.

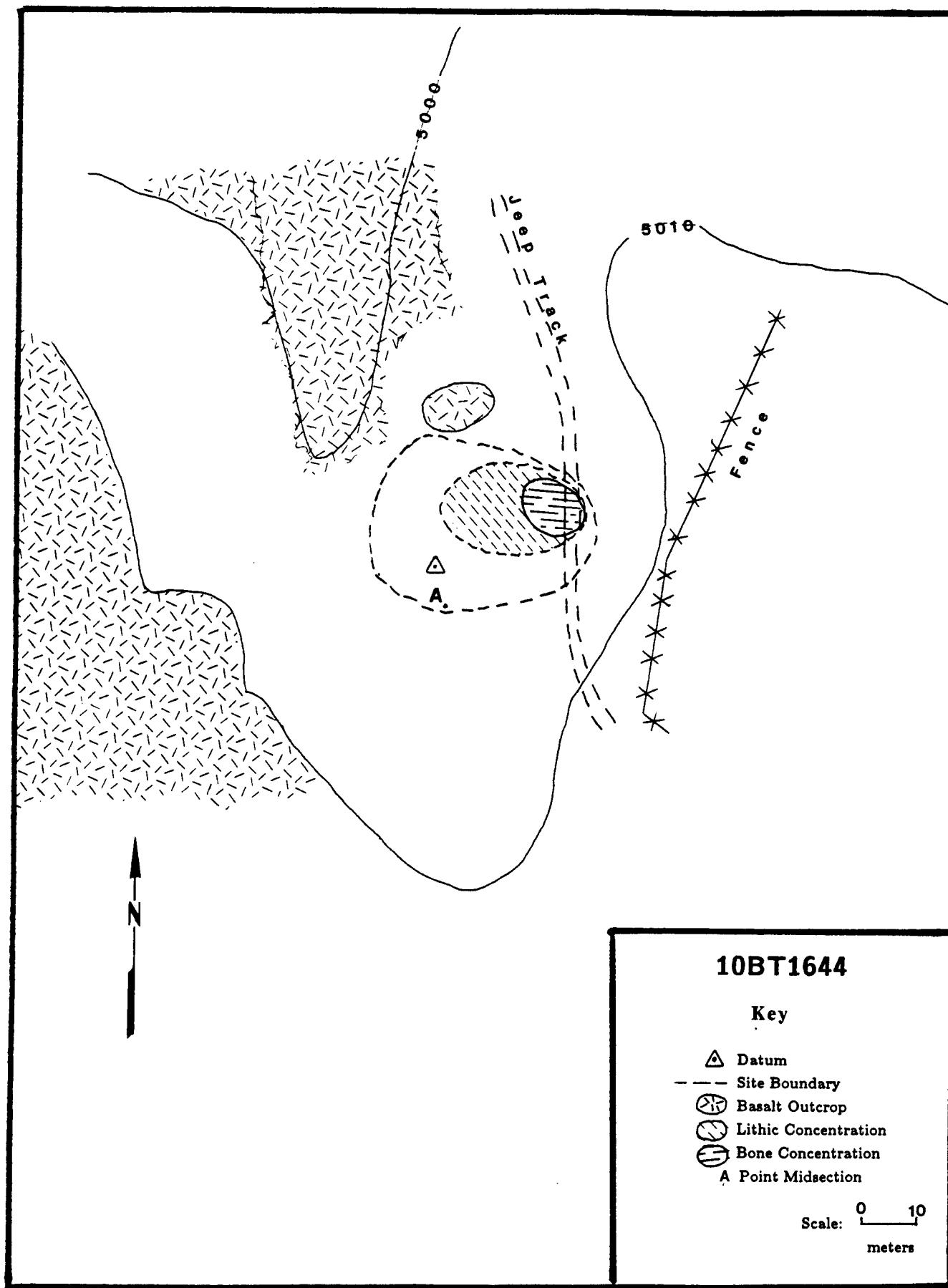


Figure 37. Planimetric map of site 10BT1644.

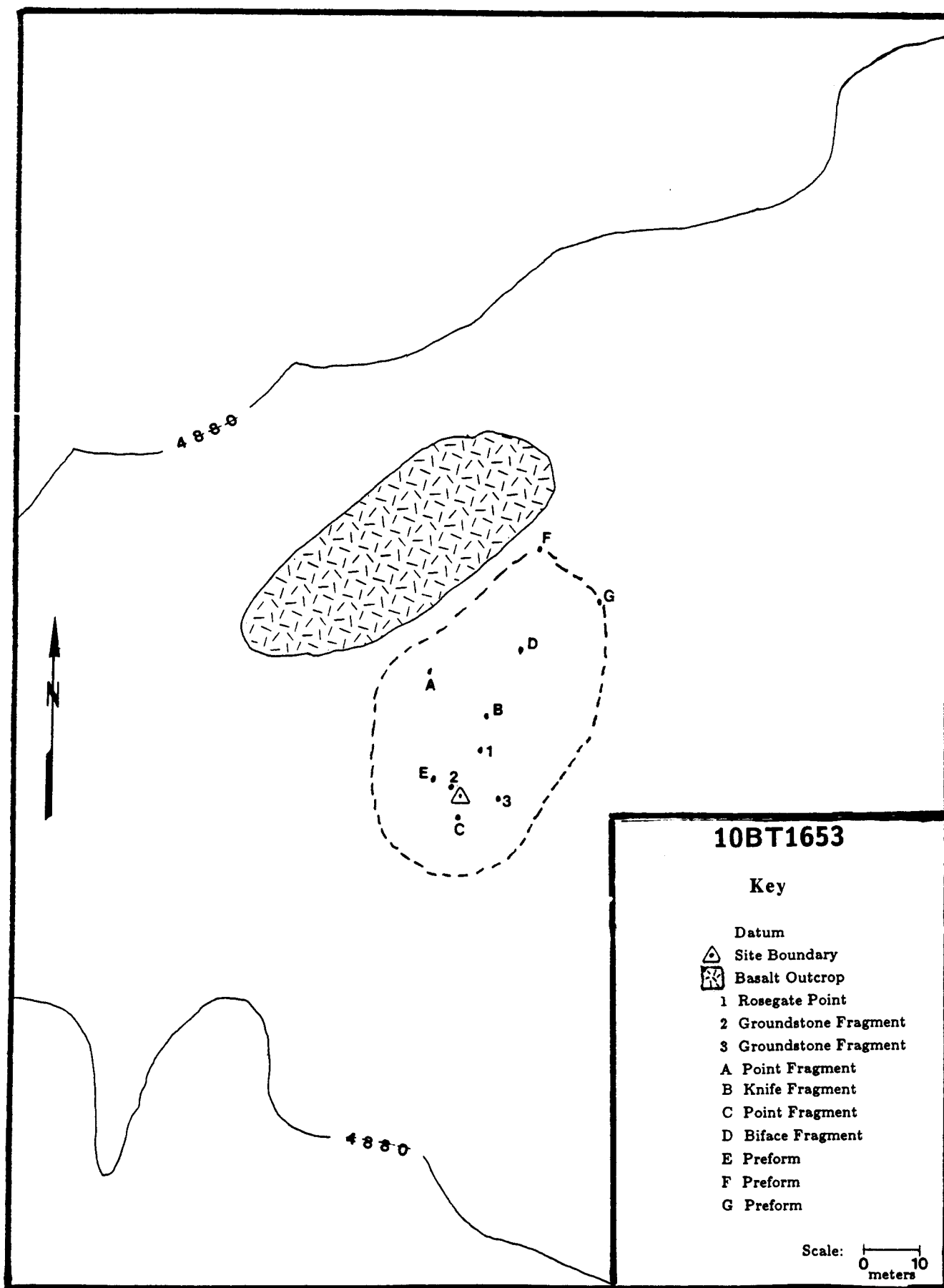
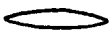


Figure 38. Planimetric map of site 10BT1653.



A



B



C

Figure 39. Artifacts collected from 10BT1653: A) 10BT1653-1, B) 10BT1653-2, C) 10BT1653-3.

The nature of the assemblage and the intensity of prehistoric activity represented on the ground surface suggests the probability of datable subsurface cultural deposits. Therefore, it is recommended that the site be formally tested.

10BT1656

Location: Quadrat 378

Impact Agents: Mild Erosion

Period of Occupation: Middle Prehistoric III

The site is a high density lithic scatter located at the edge of a playa just east of a pressure ridge (Figure 40). The playa exhibits evidence of recent water accumulation. All flaking stages are present in volcanic glass. Several exhausted volcanic glass cores were also noted, suggesting that the site was a lithic reduction location. Three Elko Corner-notched point fragments (Figure 41) and several bifaces were found in association with the scatter.

Due to the evidence of intensive prehistoric activity on the ground surface, it is recommended that the site be formally tested in order to determine its eligibility to the National Register of Historic Places.

10BT1659

Location: Quadrat 378

Impact Agents: None

Period of Occupation: Late Prehistoric II

The site is a light density lithic scatter situated in an embayment immediately southwest of a pressure ridge (Figure 42). Small tertiary volcanic glass debitage dominates the assemblage. One silicate Desert Side-notched point (Figure 43) was found in association with the scatter. The area exhibits heavy accumulations of aeolian deposits indicating the possibility that much of the site may be buried.

Subsurface cultural material may be present in the actively accreting sand, therefore, it is recommended that the site be formally tested.

10BT1660

Location: Quadrat 297

Impact Agents: None

Period of Occupation: Middle Prehistoric III

The site is a light density lithic and bone scatter located on the north slope of a small sand dune (Figure 44). A large ephemeral lake is located northeast of the site. The debitage was primarily volcanic glass secondary and tertiary flakes. A number of tools were found in association, including several expedient tools, bifaces, an exhausted volcanic glass core, a scraper and two large Elko Corner-notched points (Figure 45). The faunal remains consisted of a number of small burned

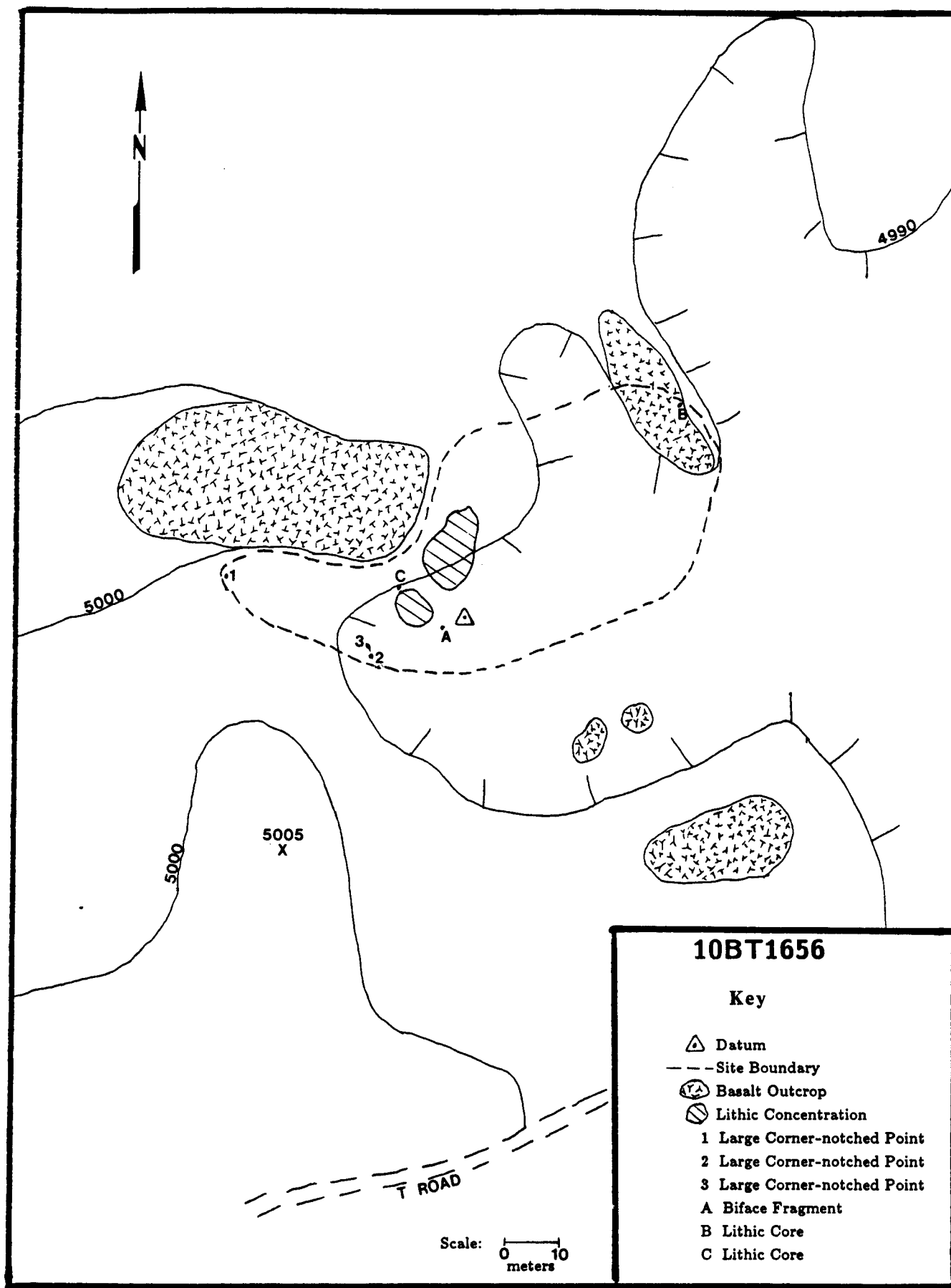


Figure 40. Planimetric map of site 10BT1656.



A



B



C

Figure 41. Artifacts collected from 10BT1656: A) 10BT1656-1, B) 10BT1656-2, C) 10BT1656-3.

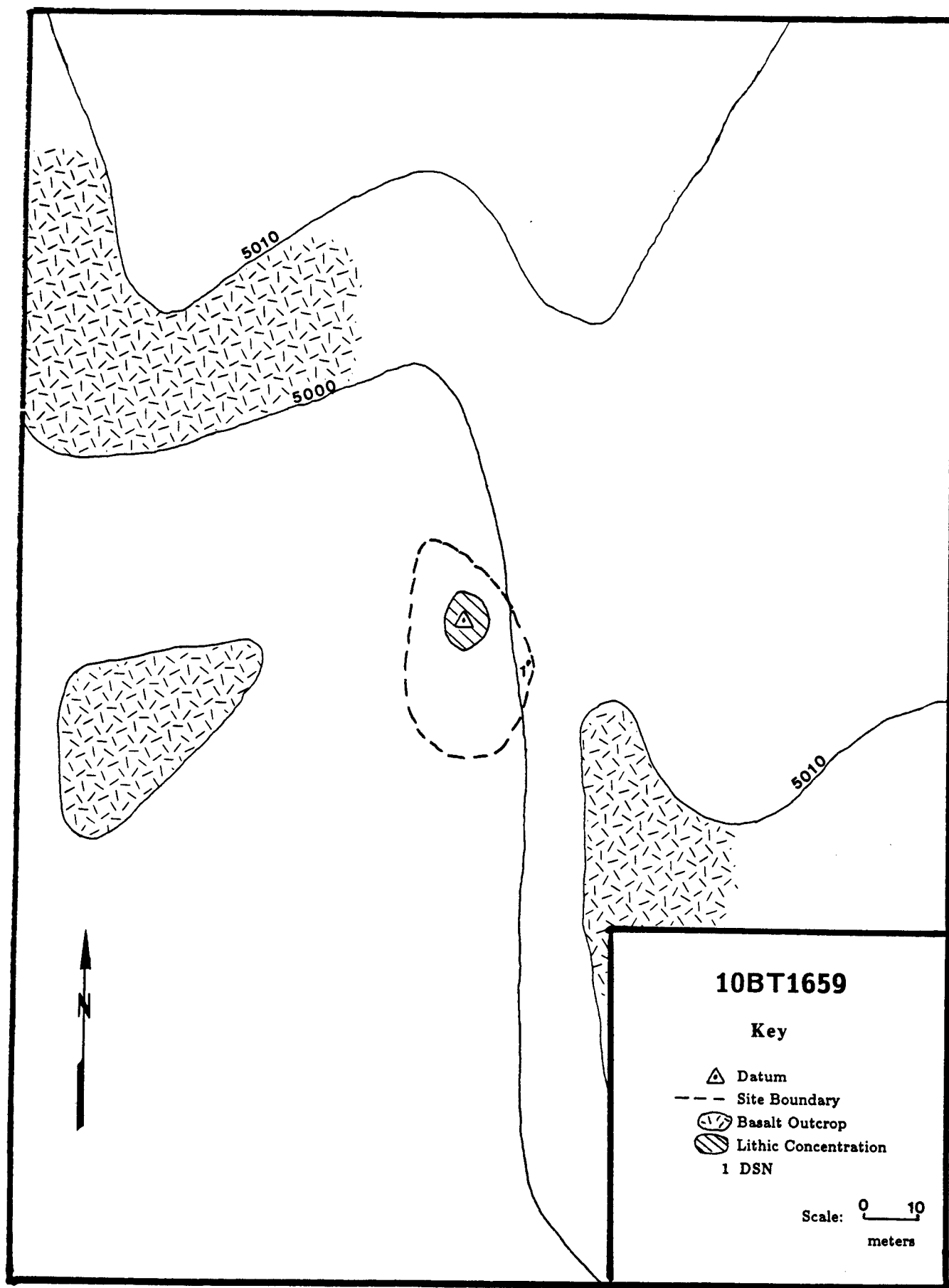


Figure 42. Planimetric map of site 10BT1659.



A

Figure 43. Artifact collected from 10BT1659; A) 10BT1659-1.

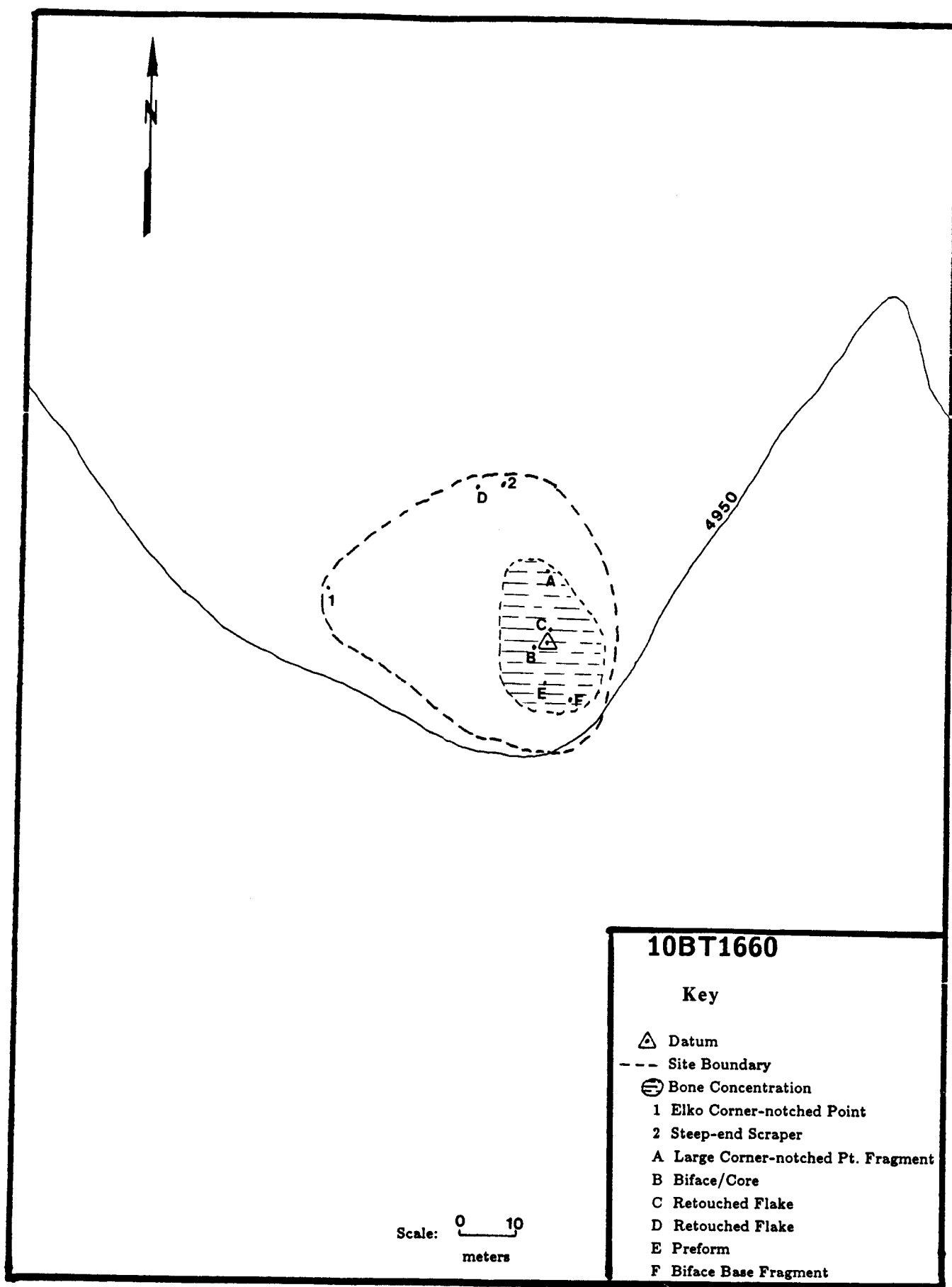
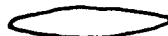
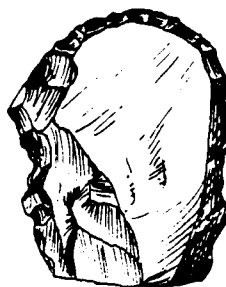


Figure 44. Planimetric map of site 10BT1660.



A



B

Figure 45. Artifacts collected from 10BT1660: A) 10BT1660-1, B) 10BT1660-2.

bone and tooth enamel fragments clustered near the central portion of the site.

The presence of faunal remains indicates the possibility of buried cultural features, therefore, it is recommended that the site be formally tested.

10BT1666

Location: Quadrat 045

Impact Agents: None

Period of Occupation: General Prehistoric

The site consists of two stone features located on low basalt ridges paralleling a shallow ravine (see Figure 46). One is a partially collapsed semi-circle of basalt boulders forming the "outer wall" of a basalt fissure (Figure 47). This feature (which is roughly 3 meters in diameter) probably functioned as a hunting blind, as indicated by its location near the ravine. The other feature is "pile" of basalt boulders (Figure 48) located directly across the ravine from the hunting blind on a low basalt rise. It is roughly 1 meter in diameter and 40 centimeters high. This feature may be the remains of another blind, or may have served another function related to hunting activities. The only artifactual material found in association with the stone features was a nondiagnostic point fragment located within the ravine.

The features should be preserved for future research. It is also recommended that shovel tests be performed in the vicinity of the ravine in order to uncover possible evidence of hunting activities.

10BT1667

Location: Quadrat 045

Impact Agents: None

Period of Occupation: General Prehistoric

The site consists of a scatter of waste flakes, fire-cracked rock and bone fragments located on the west facing slope of a low ridge (Figure 49). Volcanic glass tertiary debitage makes up the bulk of the lithic assemblage. Roughly ten fire-cracked quartzite cobbles were located in a ten meter radius in the southern portion of the site (see Figure 49), however, no distinct features were visible. Bone fragments were sparsely scattered with one small tooth enamel concentration noted on the northern edge of the site. Two expedient flake tools were associated with the scatter.

The presence of fire-cracked rock and bone fragments may indicate the possibility of a buried cultural feature with datable material, therefore, it is recommended that the site be formally tested.

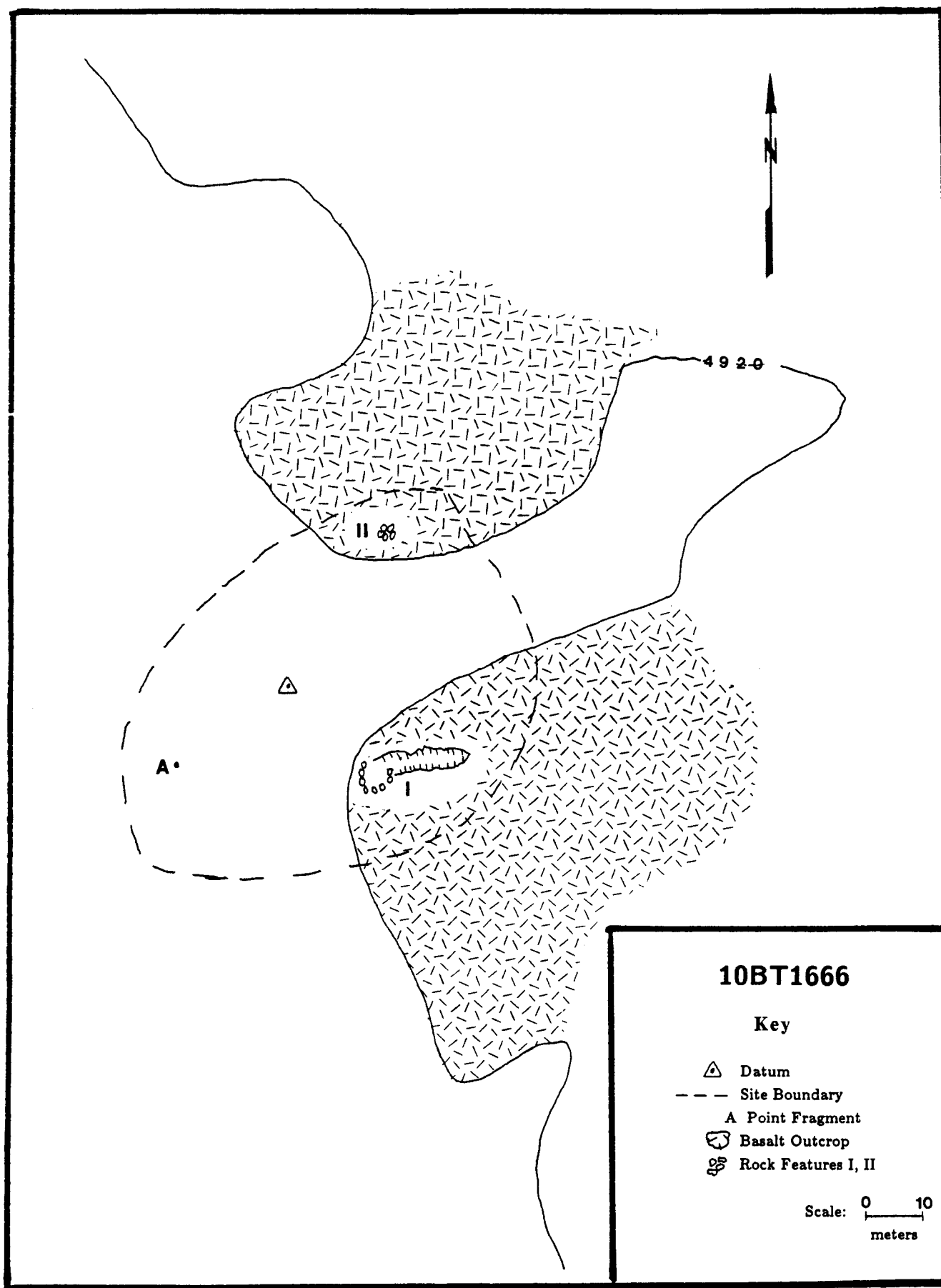


Figure 46. Planimetric map of site 10BT1666.

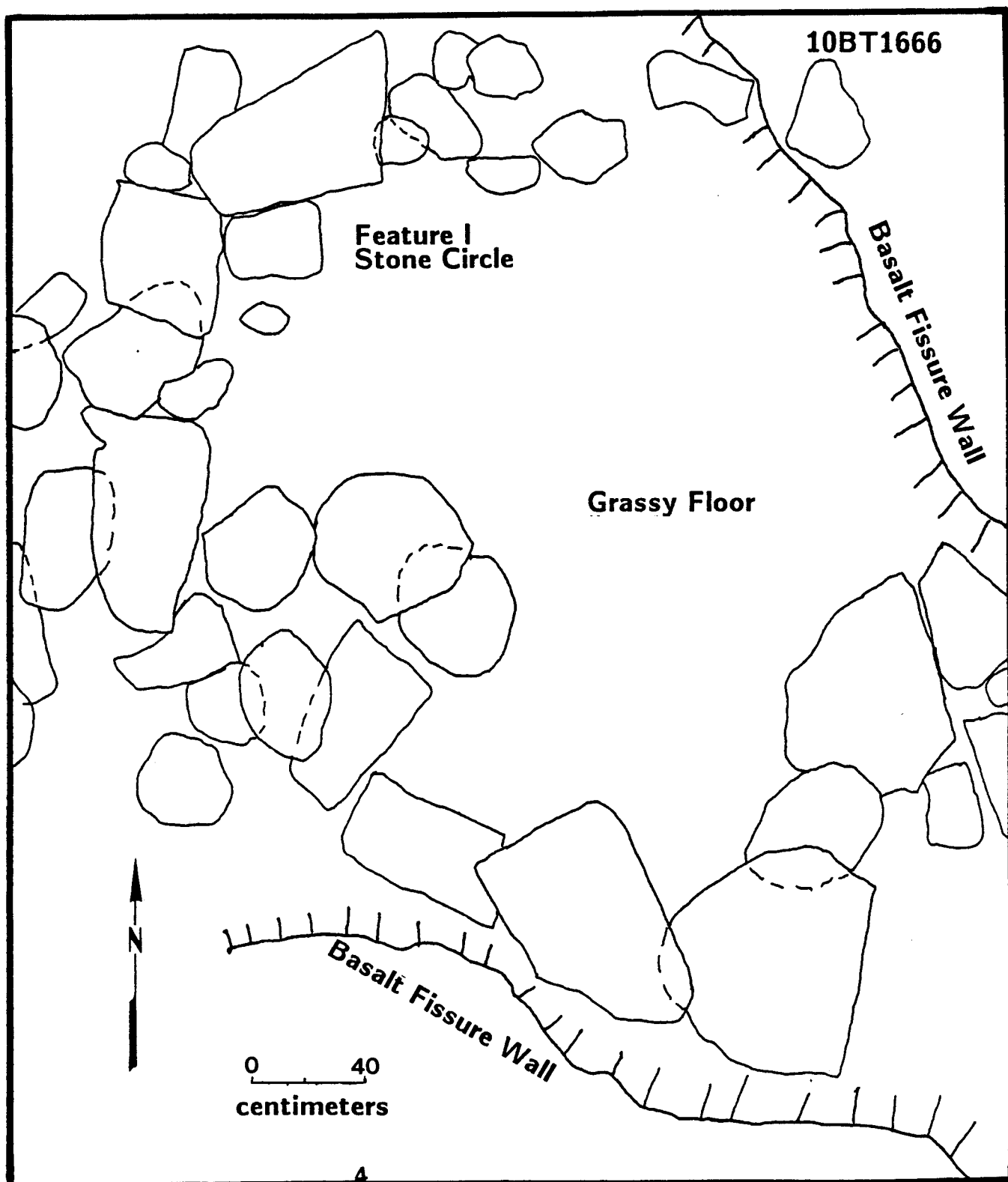


Figure 47. Planimetric map of 10BT1666 Feature I.

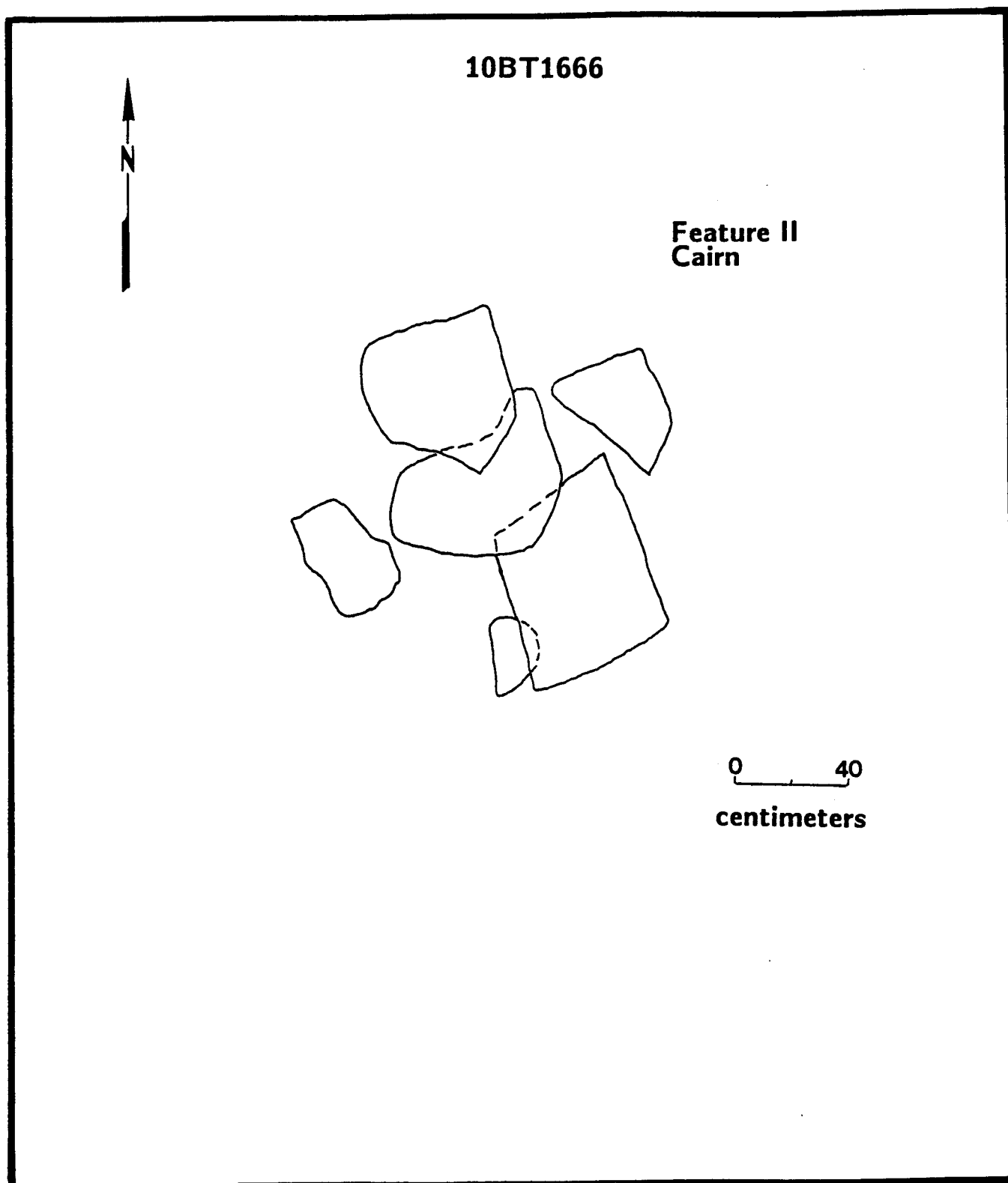


Figure 48. Planimetric map of 10BT1666 Feature II.

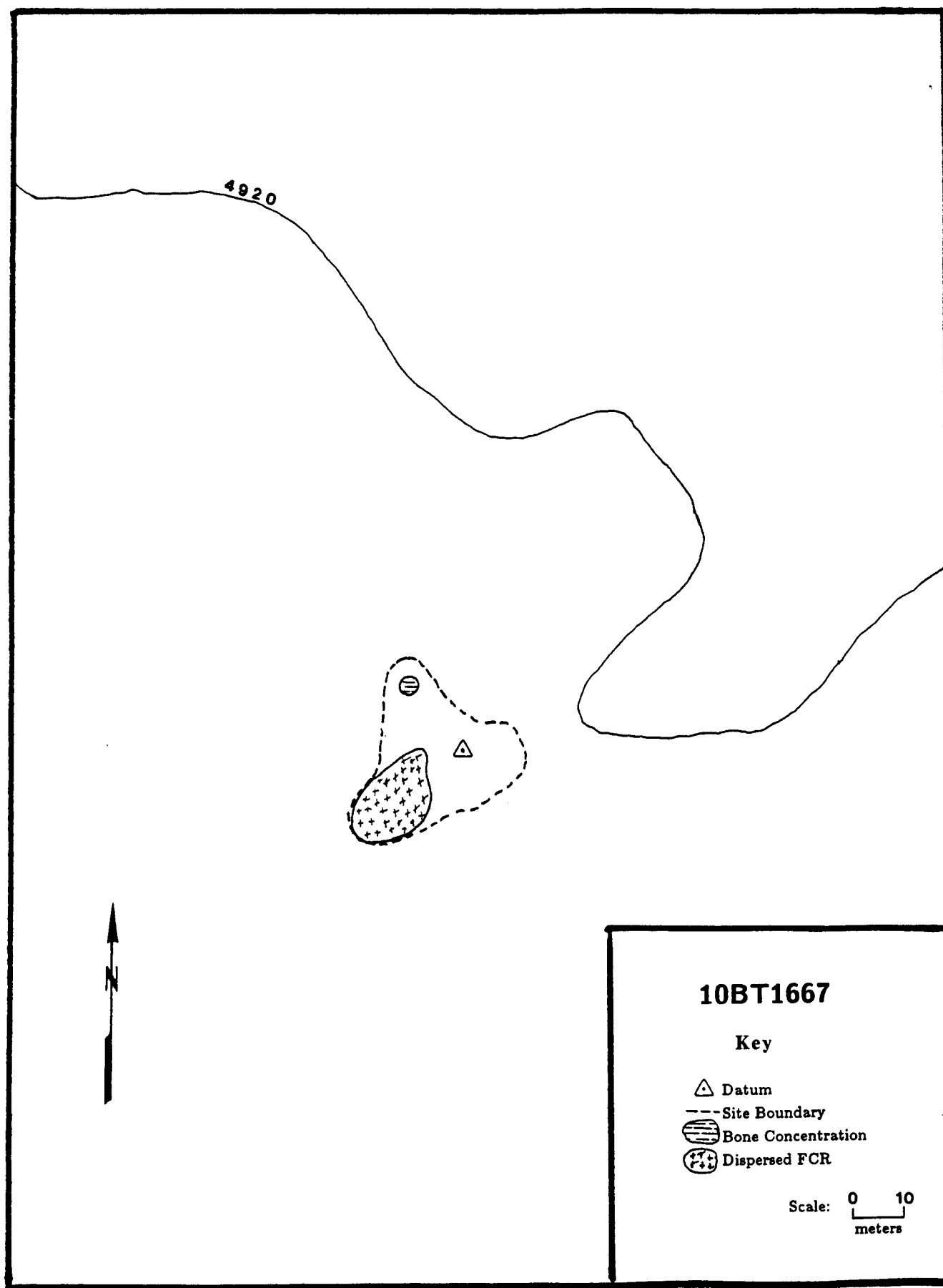


Figure 49. Planimetric map of site 10BT1667.

10BT1670

Location: Quadrat 468

Impact Agents: Mild Erosion

Period of Occupation: Middle Prehistoric

The site is a widely dispersed, low density lithic scatter of predominately volcanic glass tertiary flakes located in a depression on the northeast side of a pressure system (Figure 50). An intermittent drainage channel intersects the scatter on its eastern edge. No discernable concentrations of debitage were present. One fragment of fire-cracked quartzite was noted, however no other evidence of a cultural feature was visible. Bone and tooth enamel fragments were sparsely scattered throughout the site. A large number of biface fragments were found in association with the scatter, along with 2 large corner-notched point fragments (Figure 51), and several expedient flake tools.

Due to the nature of the assemblage, the possibility of a buried cultural feature is likely. Therefore, it is recommended that the site be formally tested.

10BT1672

Location: Quadrat 401

Impact Agents: None

Period of Occupation: Middle Prehistoric I

The site is a moderately dense scatter of debitage and bone fragments located in an open basin (Figure 52). Over 100 waste flakes were noted, of which most were secondary volcanic glass. One large side-notched point base, a lanceolate point base (Figure 53) and two biface fragments were associated with the scatter. No evidence of cultural features was visible on the ground surface.

Buried cultural materials may be present in geologically active deposits. Therefore, it is recommended that the site be formally tested.

10BT1676

Location: Quadrat 401

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a low density lithic scatter situated in a small, enclosed depression (Figure 54). The site also extends to the eastern slope of a basalt ridge. No tools were found in association with the debitage, which consisted of primarily volcanic glass secondary and tertiary flakes. One small concentration of debitage was located in the central portion of the site. Bone and tooth enamel fragments were also dispersed in low quantities within the site boundaries.

Faunal remains may indicate the presence of a buried cultural feature, therefore, it is recommended that the site be formally tested.

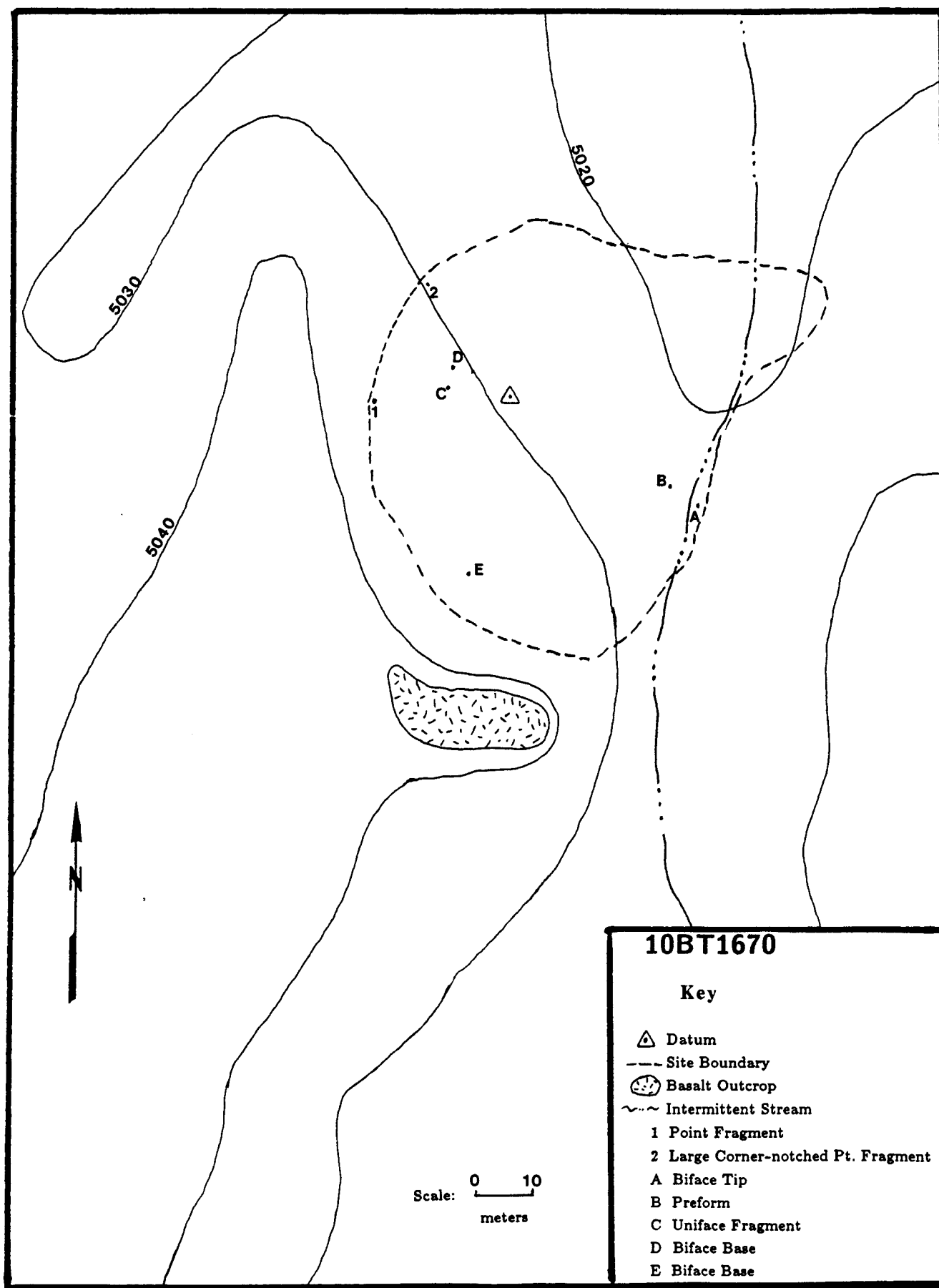


Figure 50. Planimetric map of site 10BT1670.

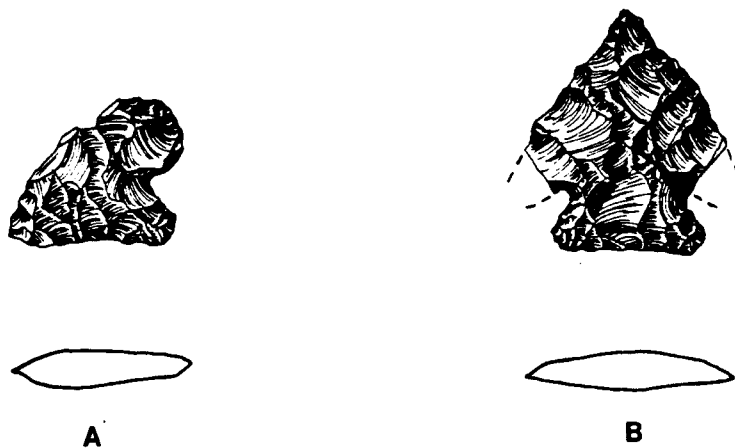


Figure 51. Artifacts collected from 10BT1670: A) 10BT1670-1, B) 10BT1670-2.

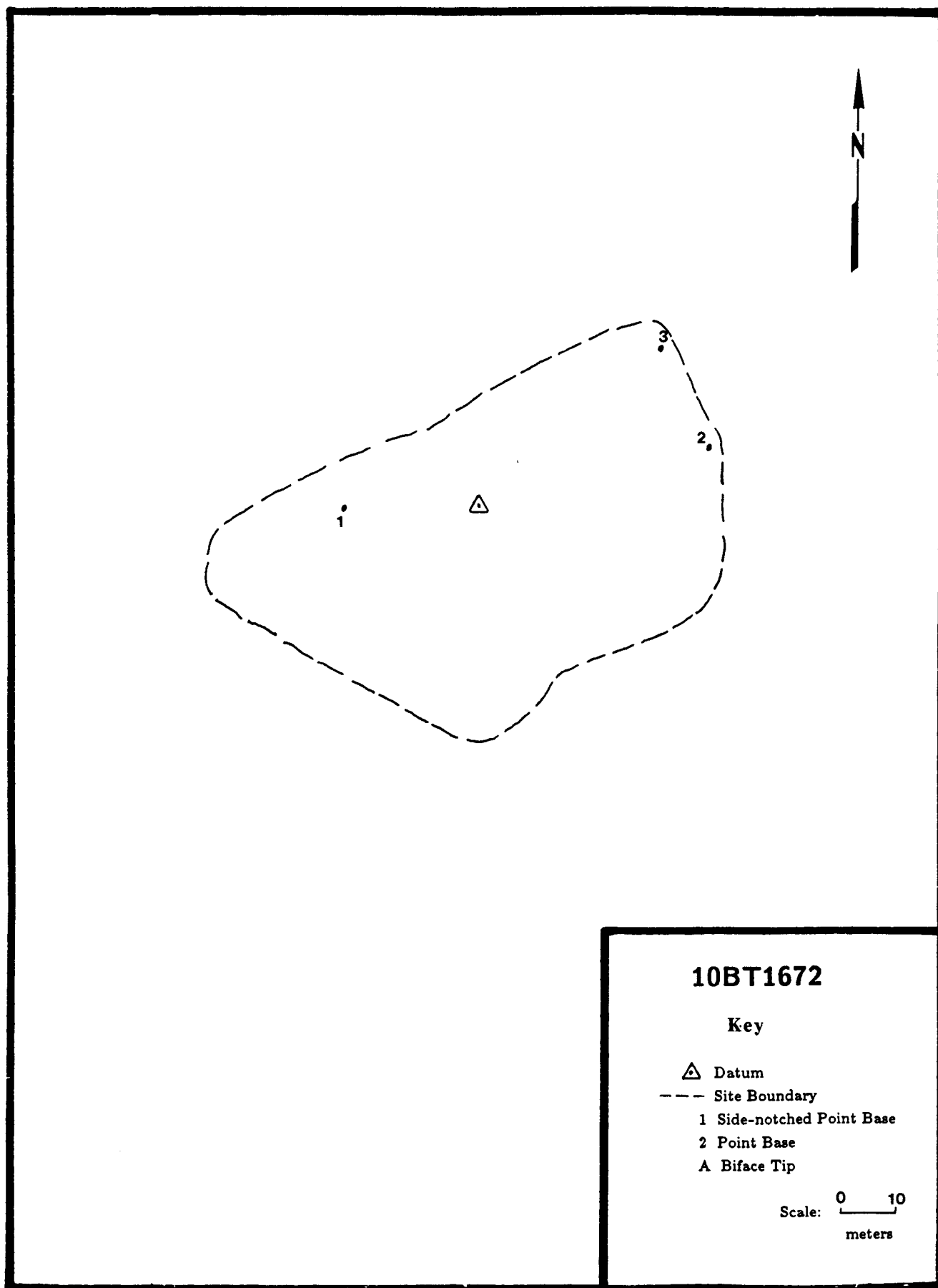


Figure 52. Planimetric map of site 10BT1672.

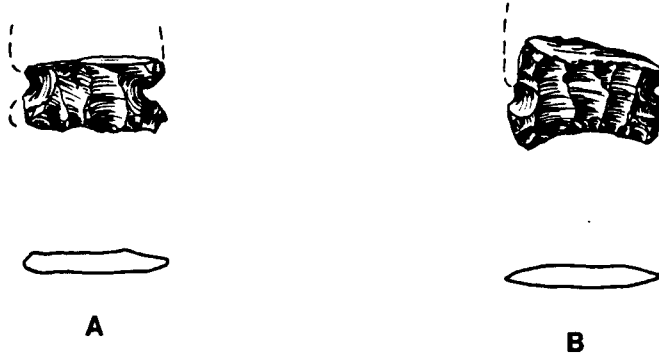


Figure 53. Artifacts collected from 10BT1672: A) 10BT1672-1, B) 10BT1672-2.

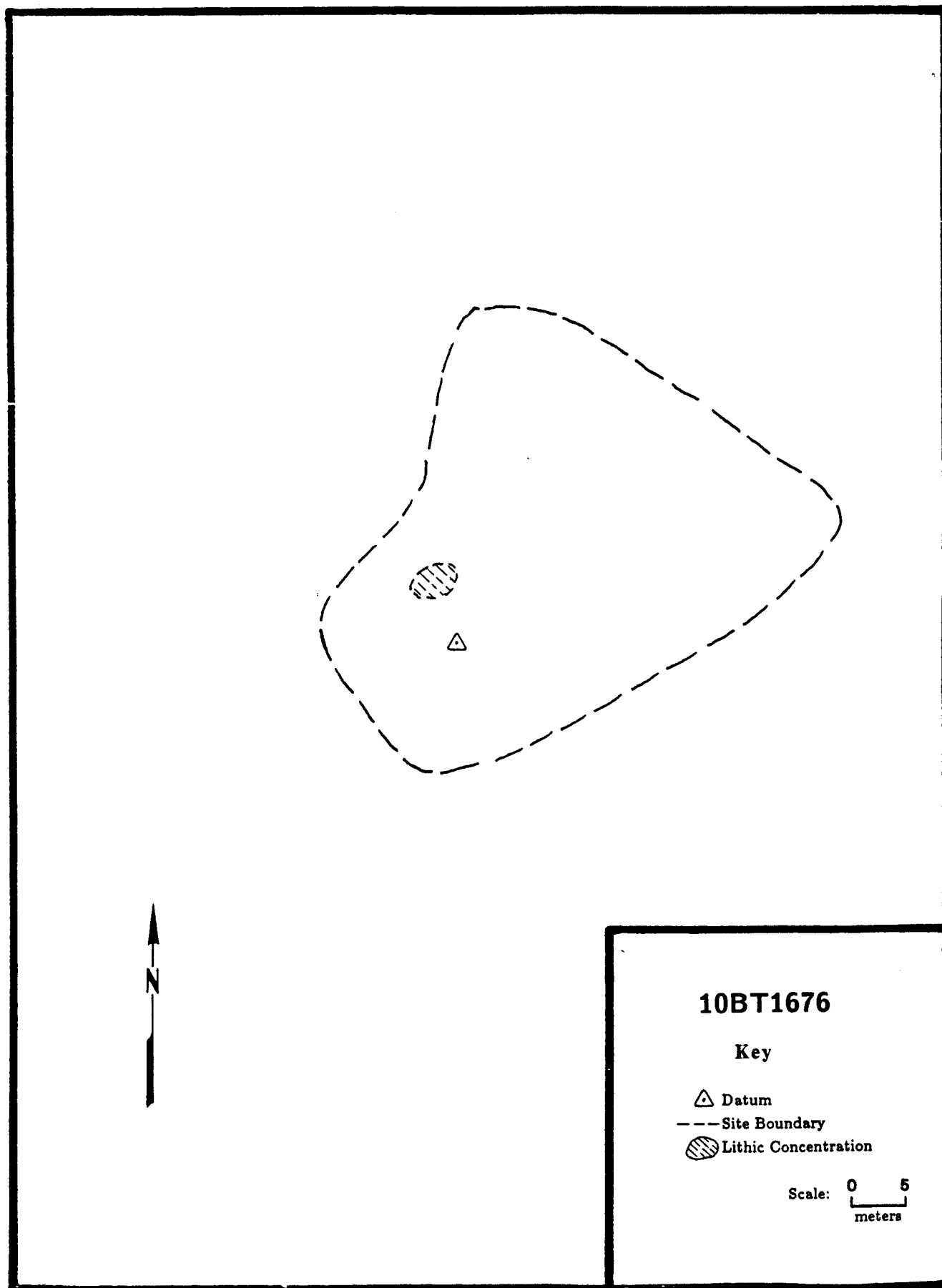


Figure 54. Planimetric map of site 10BT1676.

10BT1677

Location: Quadrat 401

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a moderately dense lithic scatter located on the southeastern slope of a basalt pressure ridge (Figure 55). Over 200 waste flakes of secondary and tertiary volcanic glass were noted. One scraper, a drill fragment (see Figure 56) and two bifaces were recovered from the site. No faunal remains or cultural features were evident on the ground surface.

Actively accreting aeolian deposits indicate probable depth, therefore, the site is recommended for formal testing.

10BT1687

Location: Quadrat 691

Impact Agents: Mild erosion, Rodent Burrowing

Period of Occupation: Middle Prehistoric III

The site is an extensive, low density scatter of volcanic glass, silicate, and quartzite waste flakes located in a small basin (Figure 57). All reduction stages appeared to be present, with secondary flakes being dominant. Several bifaces, scrapers and expedient tools were associated with the site, as well as two large corner-notched point fragments (Figure 58). Small fragments of bone and artiodactyl tooth enamel were sparsely scattered throughout the site. No evidence of cultural features was visible.

The intensive prehistoric activity evident on the surface of this site may indicate the presence of subsurface cultural material, therefore, the site should be formally tested.

10BT1688

Location: Quadrat 691

Impact Agents: Rodent Burrowing

Period of Occupation: Middle Prehistoric III

The site is a large, moderately dense lithic scatter located on the southeastern slope and base of a basalt pressure ridge (Figure 59). A large basin is situated to the southeast. The scatter consists of primarily volcanic glass secondary debitage in no distinct concentrations. One exhausted volcanic glass core was noted. Three Elko Corner-notched points (Figures 60 and 61), one possible Humboldt point base, several scrapers, bifaces and one ground stone fragment (probable mano) were also found. Bone and tooth enamel fragments sparsely littered the site.

The intensity of the prehistoric activity on the ground surface suggests the possibility of a buried cultural feature, therefore, it is recommended that the site be formally tested.

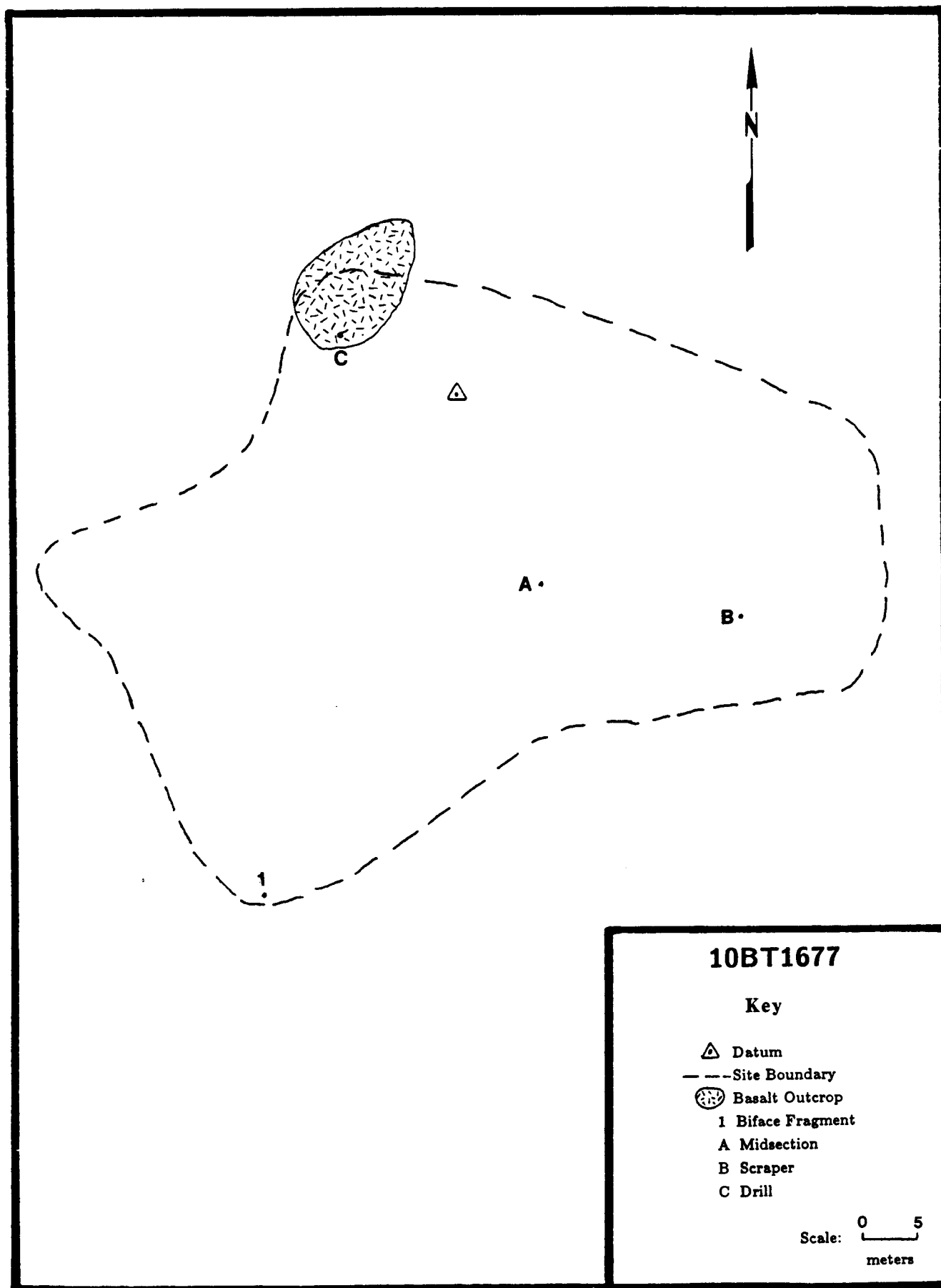


Figure 55. Planimetric map of site 10BT1677.



A

Figure 56. Artifact collected from 10BT1677: A) 10BT1677-1.

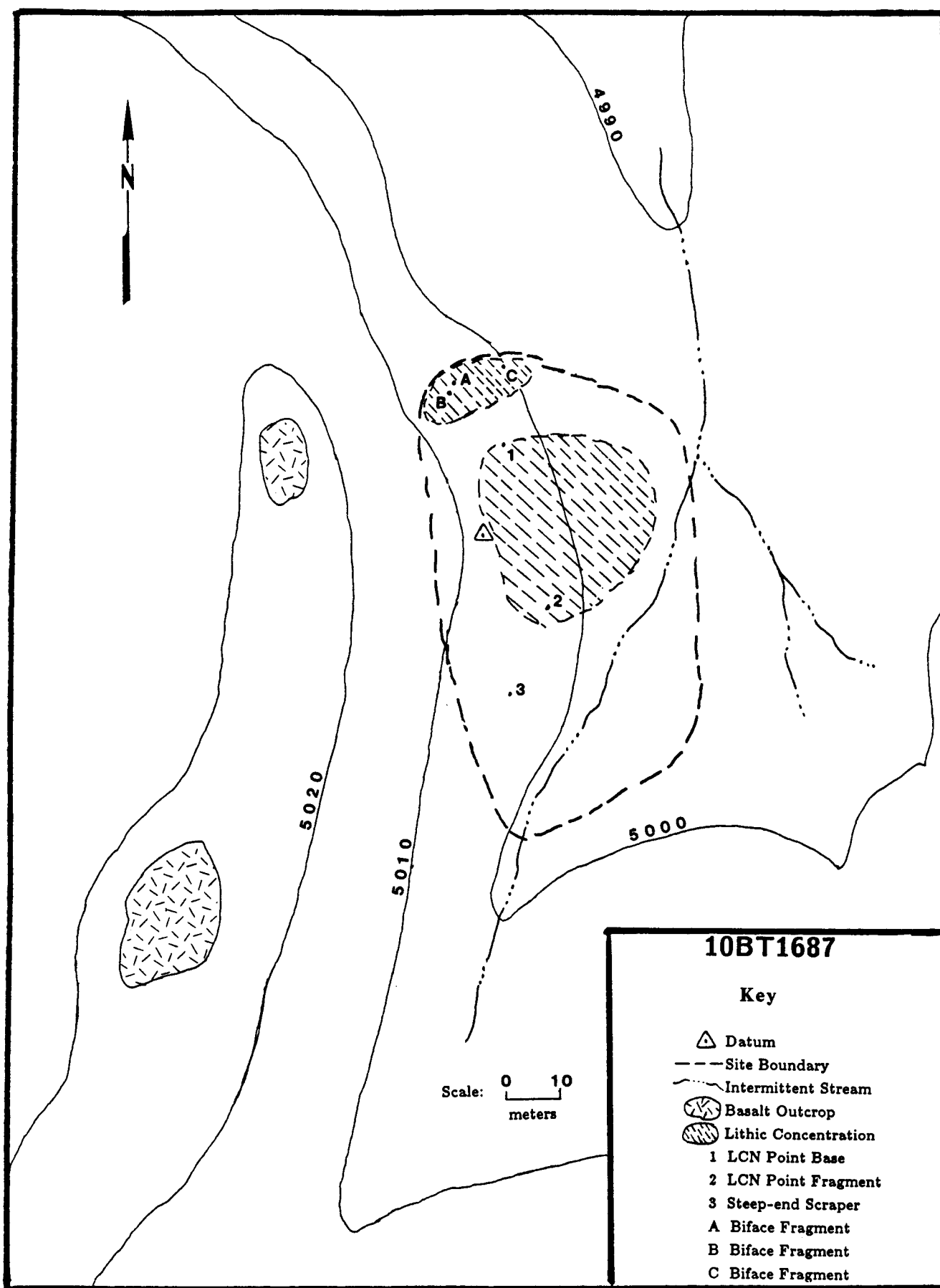


Figure 57. Planimetric map of site 10BT1687.

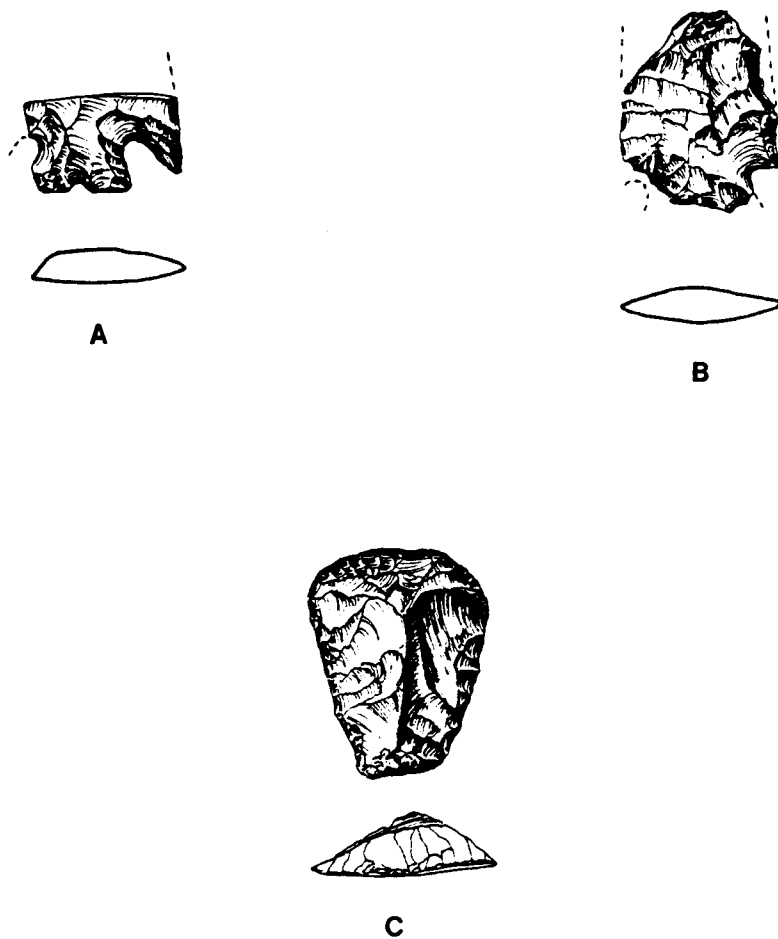


Figure 58. Artifacts collected from site 10BT1687: A) 10BT1687-1, B) 10BT1687-2, C) 10BT1687-3.

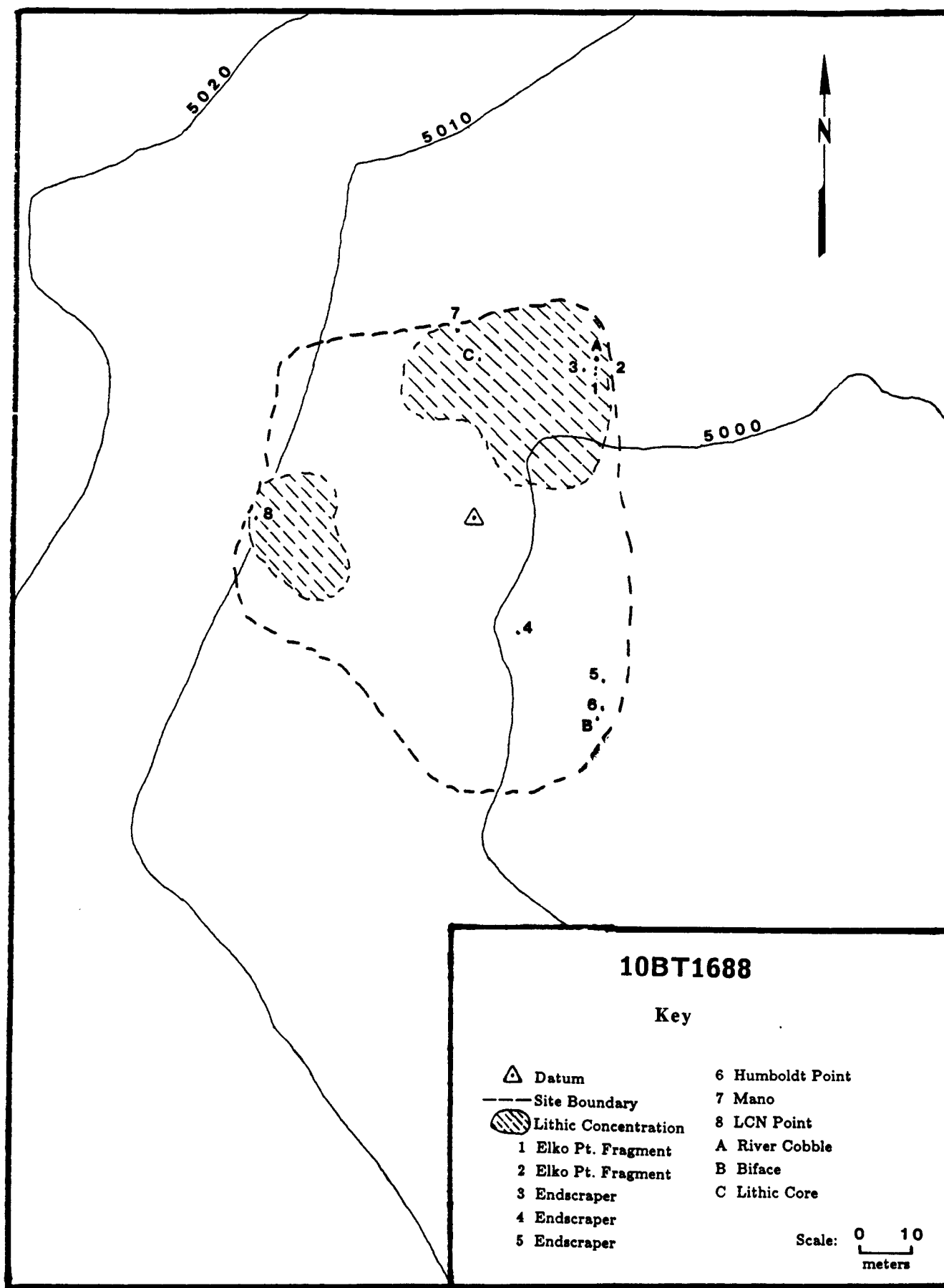


Figure 59. Planimetric map of site 10BT1688.

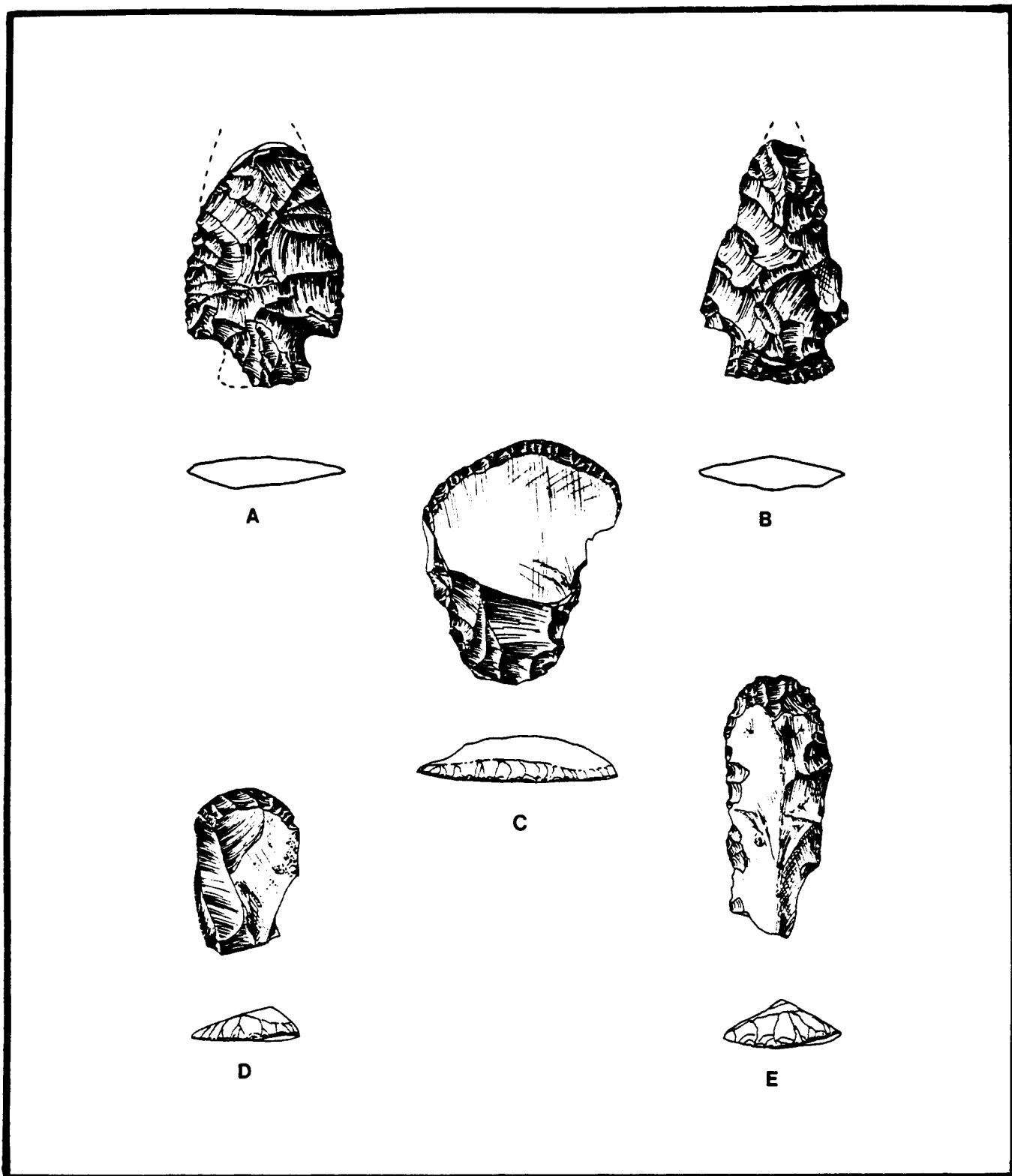
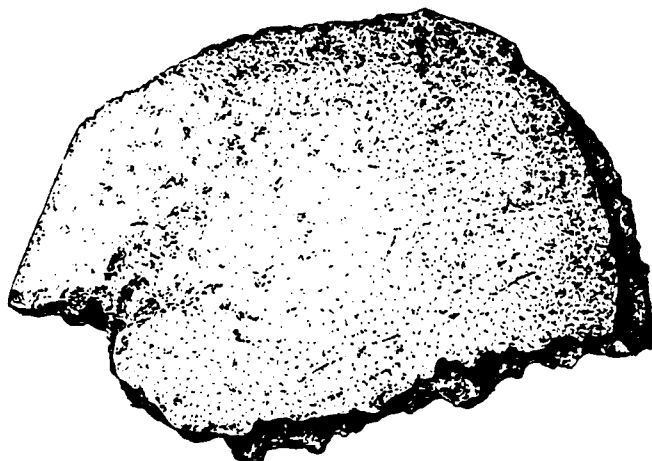


Figure 60. Artifacts collected from 10BT1688: A) 10BT1688-1, B) 10BT1688-2, C) 10BT1688-3, D) 10BT1688-4, E) 10BT1688-5.



A



B



C

Figure 61. Artifacts collected from 10BT1688: A) 10BT1688-6, B) 10BT1688-7, C) 10BT1688-8.

10BT1690

Location: Quadrat 348

Impact Agents: Possible Vandalism

Period of Occupation: Middle Prehistoric I

The site is a light density lithic scatter situated along the western edge of a broad, level playa. There are two concentrations of debitage in sandy deflated areas separated by a low basalt lobe (see Figure 62). Both concentrations are made up of primarily volcanic glass secondary flakes. One large side-notched point fragment (Figure 63), one nondiagnostic point base, several expedient tools and a scoria abrader were found in association with the scatter.

Intensive prehistoric activity is represented and buried cultural materials may be present. Therefore, the site should be formally tested.

10BT1692

Location: Quadrat 348

Impact Agents: Rodent Burrowing

Period of Occupation: Middle Prehistoric I, Late Prehistoric II

The site is a large, moderately dense scatter of lithics and faunal remains located in a shallow, enclosed draw (Figure 64) opening into a broad, deep playa to the south. All reduction stages are present and one large concentration of flakes is located in the central portion of the site. Roughly thirty percent of the debitage is silicate and fine-grained basalt, the remainder is volcanic glass. Small bone and tooth enamel fragments are heavily clustered in the western half of the site. Associated with the scatter are numerous bifaces and expedient tools as well as one Rosegate point, one Desert Side-notched point, and three large side-notched points (Figure 65). Numerous basalt rock features are located on the basalt ridges surrounding the site. Several are semi-circular and appear to be the remains of hunting blinds (Figure 66). The remaining rock features are indistinct basalt "cairns" or curvilinear rock alignments that proved very difficult to sketch. Therefore, the site must be revisited to adequately record these features.

Intensive prehistoric hunting and animal processing activities are represented, making the possibility of buried cultural materials or features likely. Therefore, it is recommended that the site be formally tested.

10BT1693

Location: Quadrat 348

Impact Agents: None

Period of Occupation: Middle Prehistoric III, Late Prehistoric

The site is a small, light density lithic scatter located in a small, sheltered embayment (Figure 67) opening to a playa to the south. Silicate and volcanic glass debitage was evenly dispersed throughout the site. All reduction stages were present. Artiodactyl tooth enamel was sparsely scattered throughout.

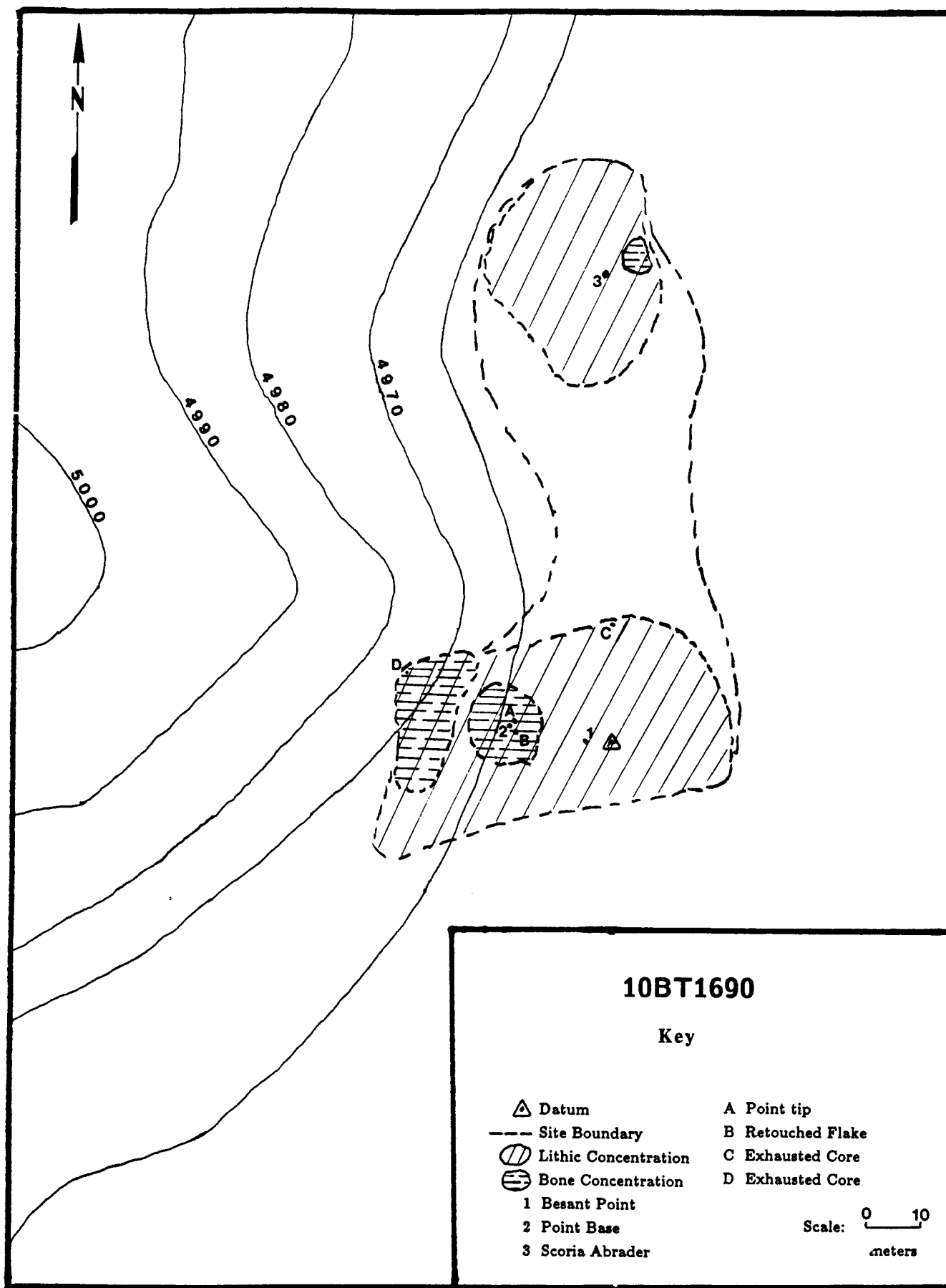


Figure 62. Planimetric map of site 10BT1690.

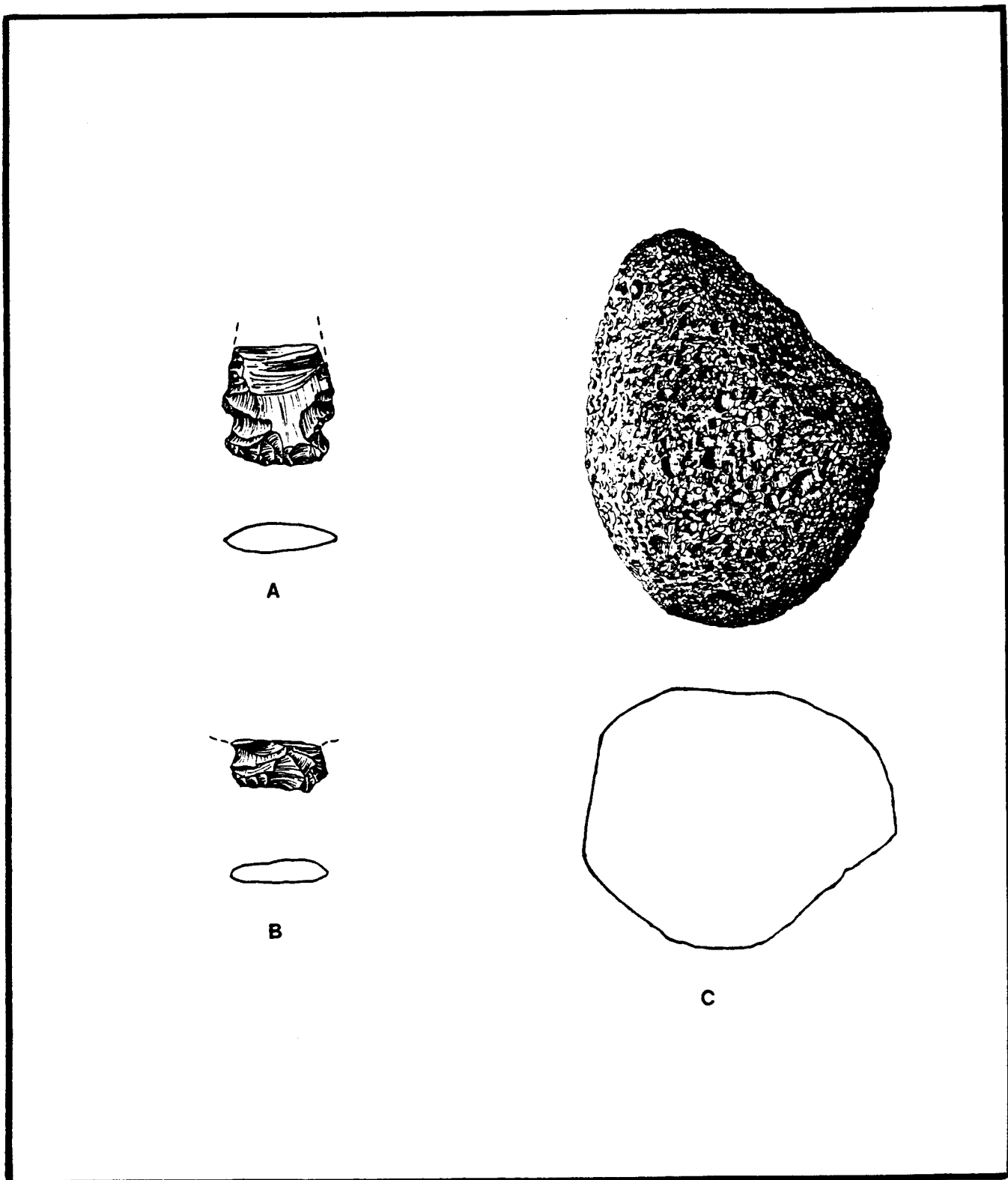


Figure 63. Artifacts collected from 10BT1690: A) 10BT1690-1, B) 10BT1690-2, C) 10BT1690-3.

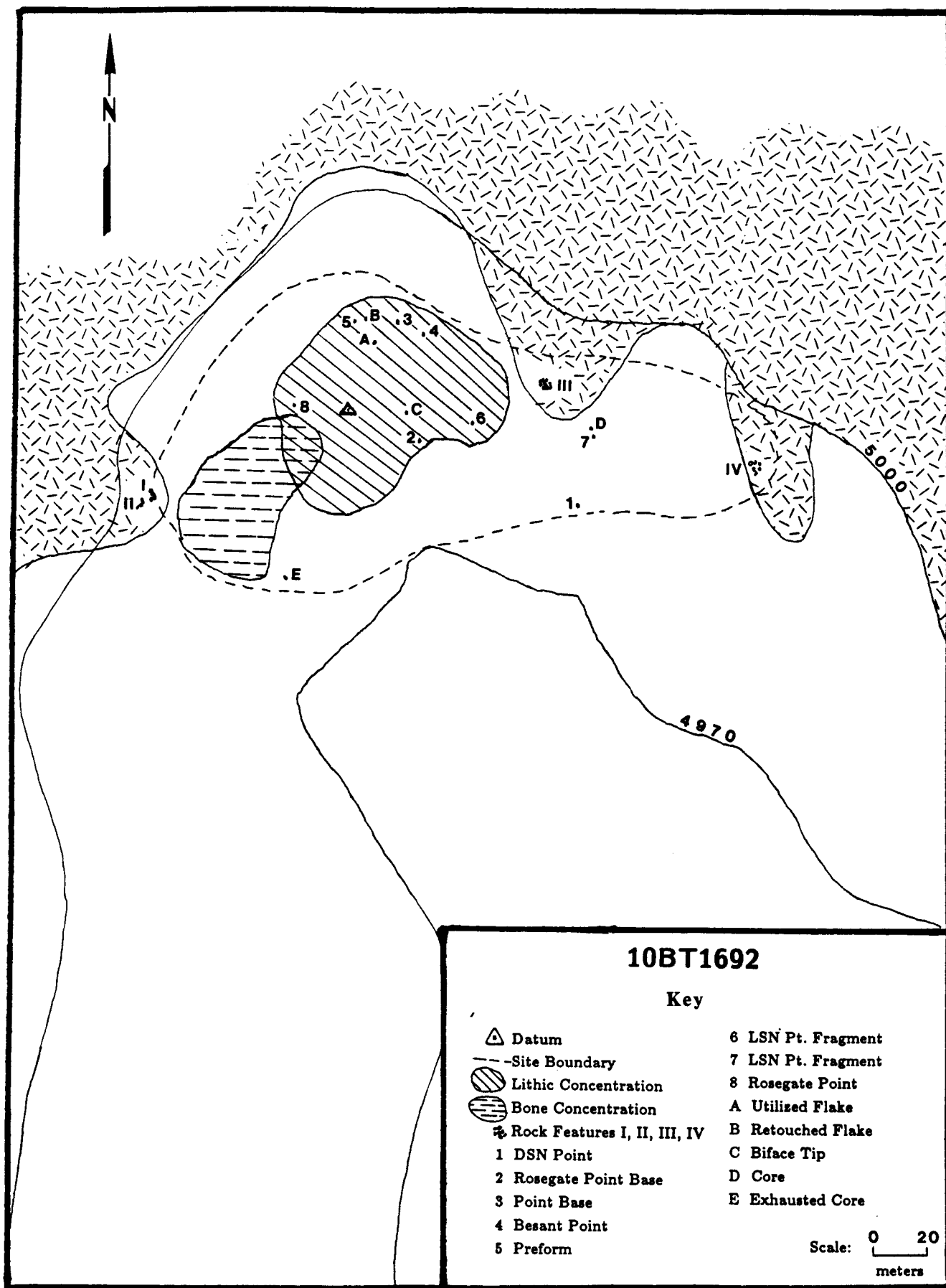


Figure 64. Planimetric map of site 10BT1692.

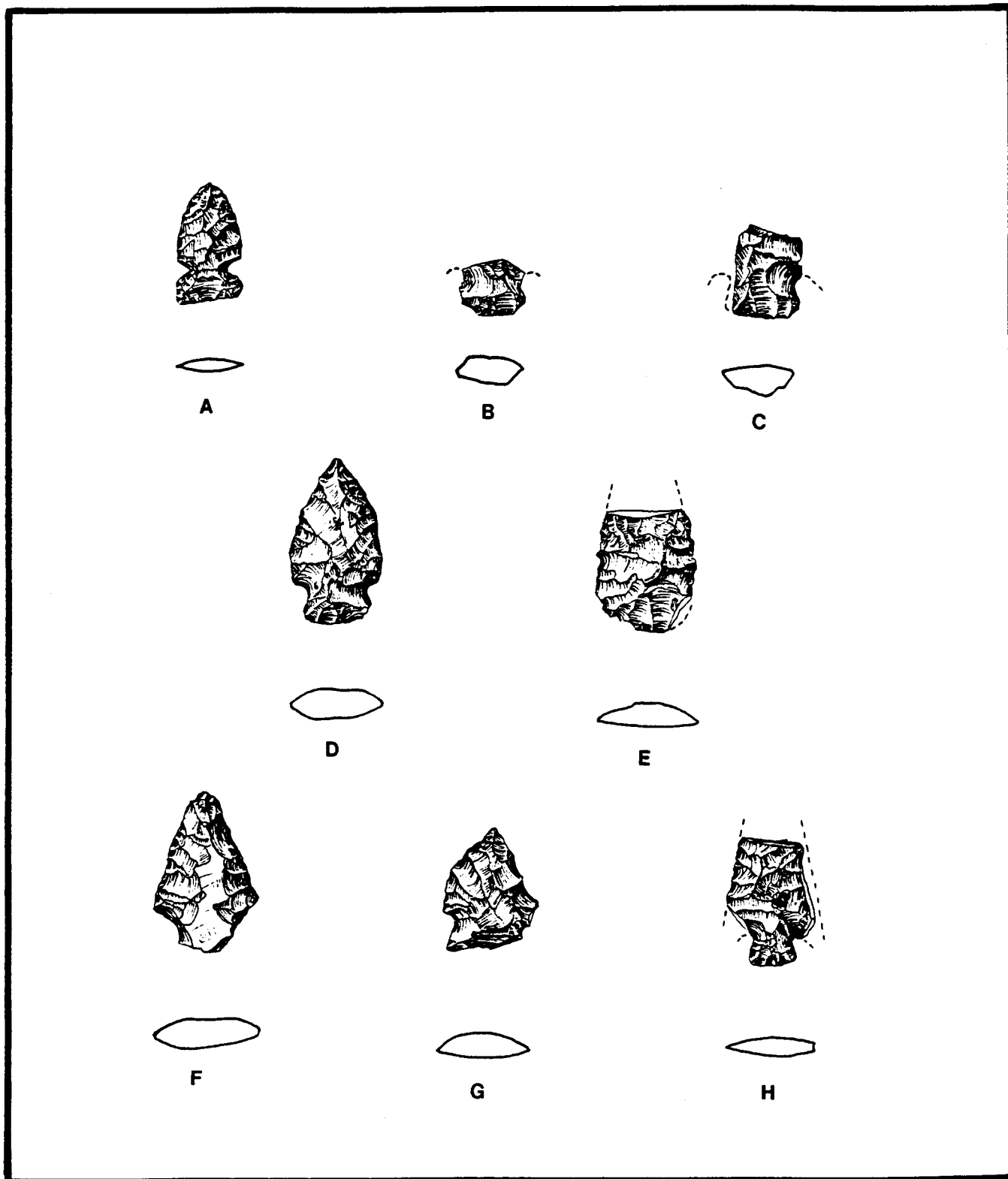


Figure 65. Artifacts collected from 10BT1692: A) 10BT1692-1, B) 10BT1692-2, C) 10BT1692-3, D) 10BT1692-4, E) 10BT1692-5, F) 10BT1692-6, G) 10BT1692-7, H) 10BT1692-8.

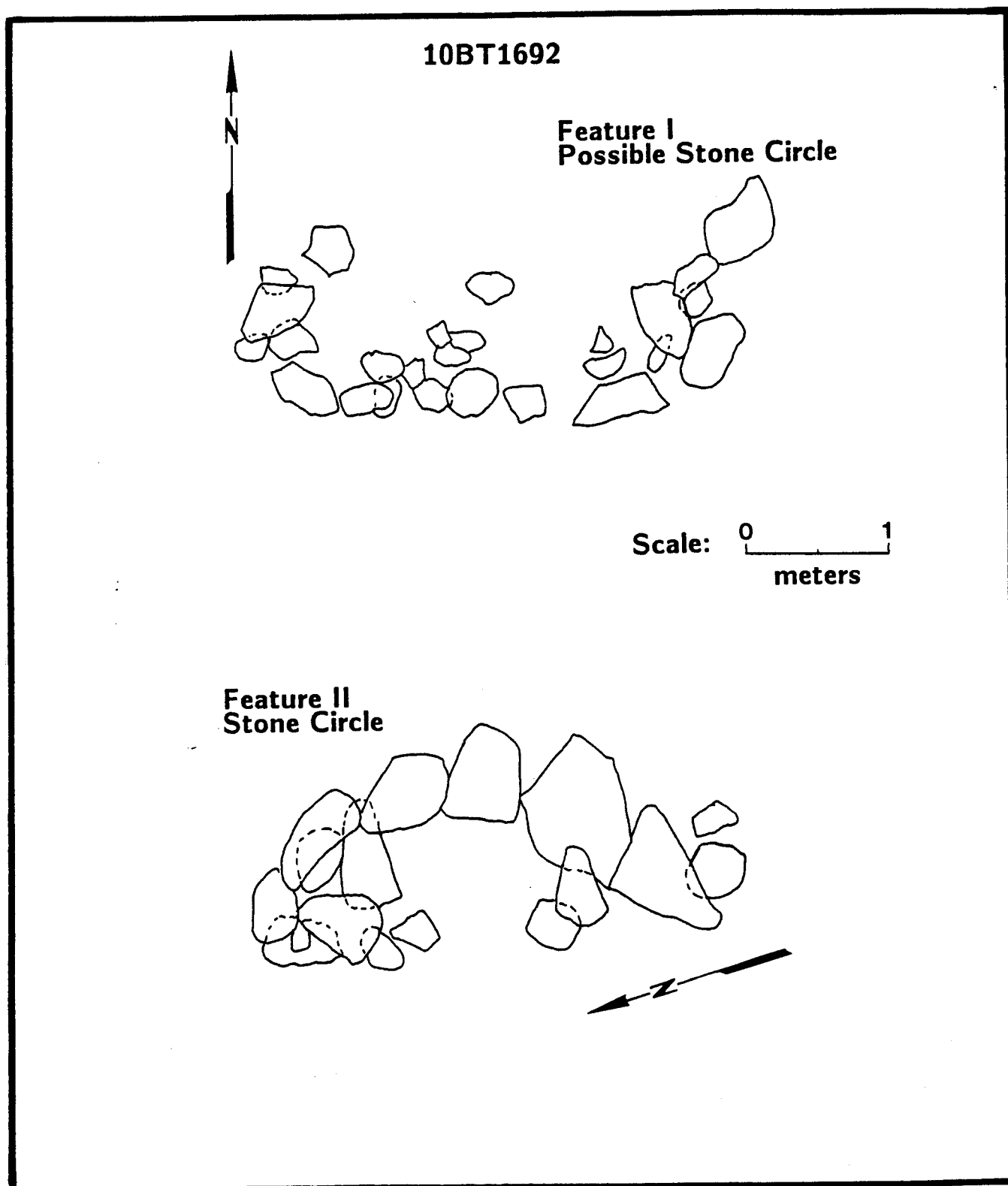


Figure 66. Planimetric map of 10BT1692 stone features.

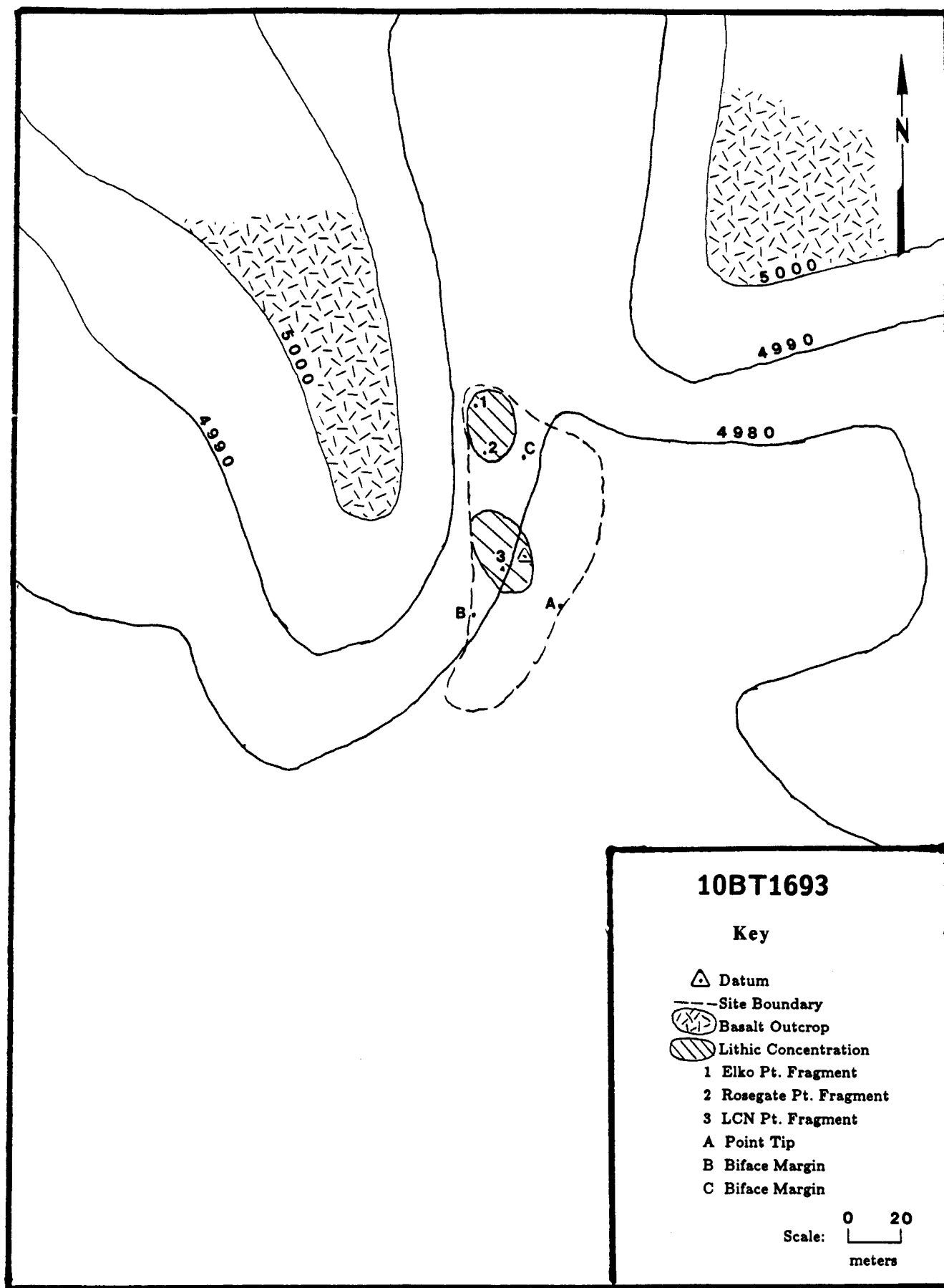


Figure 67. Planimetric map of site 10BT1693.

Several biface fragments, two large corner-notched points (Figure 68) and one small side-notched point were associated with the scatter.

Buried cultural materials may be present in the actively accreting sediments, therefore, it is recommended that the site be formally tested.

10BT1694

Location: Quadrat 348

Impact Agents: None

Period of Occupation: General Prehistoric

The site is a low density scatter of predominantly silicate debitage situated on the west side of an embayment on the northern edge of a broad playa (Figure 69). No flake concentrations were apparent. One lanceolate point blade (Figure 70), one knife fragment, several bifaces and a scraper were associated with the scatter. Small bone fragments were noted in low quantities throughout the site.

Accumulating aeolian deposits and faunal remains indicate the possibility of buried cultural material. Therefore, it is recommended that the site be formally tested.



A



B



C

Figure 68. Artifacts collected from 10BT1693: A) 10BT1693-1, B) 10BT1693-2, C) 10BT1693-3.

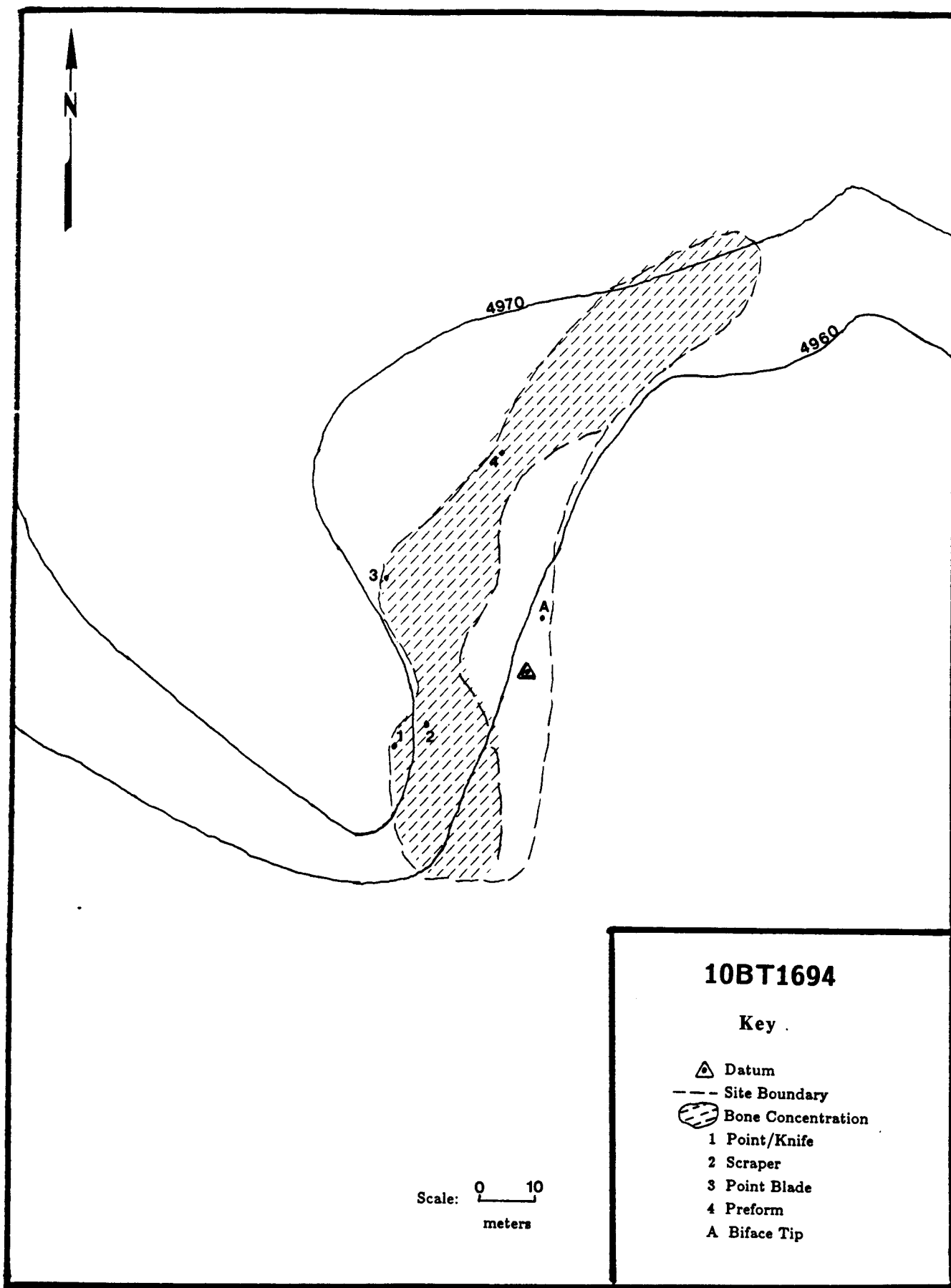


Figure 69. Planimetric map of site 10BT1694.



A



B



C



D

Figure 70. Artifacts collected from 10BT1694: A) 10BT1694-1, B) 10BT1694-2, C) 10BT1694-3, D) 10BT1694-4.

PREDICTIONS AND RECOMMENDATIONS

Because the NPR Archaeological sample universe is contained within the relatively homogeneous lava terrain on the INEL, a simple random sampling strategy was deemed appropriate for this survey. The sample universe encompasses approximately 28,350 acres and can be divided into 709 hypothetical 40-acre quadrats. Thirty 40-acre quadrats were surveyed, representing 4.2% coverage of the total area. Table 2 presents the number of cultural resources located within each sample quadrat.

Table 2: Density of Prehistoric Cultural Resource Loci
Observed Within the Designated Sample Quadrats

Sample Quadrat No.	Isolated Finds	Sites	Total Number of Loci/40-Acre Quadrat
019	2	3	5
045	1	2	3
069	0	0	0
090	0	2	2
133	0	0	0
167	2	0	2
173	0	0	0
203	0	3	3
207	2	1	3
216	1	0	1
231	2	0	2
263	2	0	2
297	2	2	4
301	0	1	1
348	1	4	5
352	0	1	1
378	1	3	4
393	0	0	0
401	2	4	6
459	3	2	5
468	0	1	1
499	1	0	1
510	0	1	1
560	0	1	1
598	6	0	6
606	1	1	2
655	1	0	1
691	1	3	4
723	0	3	3
728	0	1	1
Totals:	31	39	70

In order to estimate the total number of prehistoric cultural resources that probably exist within the NPR archaeological sample universe, the mean observed density of cultural resources per 40-acre quadrat was multiplied by the number of hypothetical 40-acre quadrats in the sample universe. The sample standard deviation was used in this case on the assumption that it closely reflects the population standard deviation.

Based on previous surveys on the INEL, Ringe (1987:172) found that approximately 1.3 sites and 1.1 isolated finds occurred within each hypothetical 40-acre quadrat within the lava terrain. The 1990 NPR Sample Survey produced identical results, with the occurrence 2.33 cultural resource loci per hypothetical quadrat, of which 1.3 are sites and 1.0 are isolated finds. The following table presents the predicted frequencies of cultural resources contained within the NPR archaeological sample universe. Standard descriptive statistics were used in calculating the mean and standard deviations as outlined in Thomas (1986) and Healey (1984).

Table 3: Total Number of Prehistoric Cultural Resource Loci Predicted for the NPR Archaeological Sample Universe.*

	Per Hypothetical 40-Acre Quadrat	Total Predicted Within Sample Universe
Total Cultural Resources	2.33 \pm .664	1652 \pm 471
Sites	1.30 \pm .478	922 \pm 339
Isolated Finds	1.03 \pm .469	730 \pm 333

*(Based on the 4.2% simple random sample at the 95% confidence level).

According to the data presented above, it is projected that between 1181 and 2123 cultural resources are contained within the 28,350 acre NPR archaeological sample universe. Of these, between 397 and 1063 are expected to be isolated finds that will not require work beyond the initial recording. The number of expected potentially significant sites within the sample universe is between 583 and 1261. These resources are likely to yield information critical to our understanding of regional prehistory. Therefore, they will require additional investigation and/or mitigation procedures as dictated by federal guidelines and in consultation with the State Historic Preservation Office. These procedures must be carried out prior to any adverse impacts resulting from future construction activities.

It should be noted that while the predictions provided above concur with those presented in Ringe (1987) for the lava zone on the INEL, the 1990 NPR sample survey represents only a small portion of the designated NPR archaeological universe. A note of caution must therefore be extended because small samples may introduce biases that decrease the reliability of the predictions. The results of this survey should be used only as a general guide to future project planning and should never be regarded as an alternative to actual field survey of areas proposed for construction or ground disturbance. Hopefully the predictions provided in this report will aid project managers in the allocation of adequate funds and time for the mitigation of cultural resources and avoid delays in construction plans.

Of the 78 cultural resources that were encountered during this survey, 40 have been recommended as potentially eligible to the National Register of Historic Places. If any of these resources are threatened by future ground disturbing projects, they will require mitigative procedures prior to construction.

BIBLIOGRAPHY

- Healey, Joseph F.
1984 Statistics: A Tool for Social Research. Wadsworth Publishing Company, Belmont, California.
- Reed, William G., J.W. Ross, B.L. Ringe, and R.N. Holmer
1986 Archaeological Investigations on the INEL 1984-1985: A Report of Cultural Resource Inventory Projects in Eight Volumes. Swanson/Crabtree Anthropological Research Laboratory Reports of Investigations 86-4. Idaho State University, Pocatello.
- Ringe, Brenda L., Richard N. Holmer, Susanne Miller, Jonena Hearst, and William Akersten
1987 Archaeological and Paleontological Survey of the Idaho National Engineering Laboratory for the Super Conducting Super Collider. Idaho Museum of Natural History Reports of Investigations: 87-12. Pocatello, Idaho.
- Ringe, Brenda L.
1990 Archaeological Investigations at New Production Reactor Area E on the Idaho National Engineering Laboratory. EG&G Idaho, Inc. Idaho Falls, Idaho.
- Thomas, D.H.
1986 Refiguring Anthropology: First Principles of Probability and Statistics. Waveland Press, Inc., Prospect Heights, Illinois.