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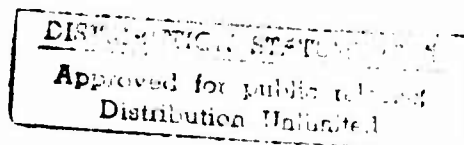
REPORT ON PHASE II ARCHAEOLOGICAL
TESTING AT 21 AK 11, BIG SANDY LAKE,
AITKIN COUNTY, MINNESOTA (JUNE 10-11
AND AUGUST 1-5 AND 20-21, 1985)

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Submitted October 5, 1987



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MANAGEMENT SUMMARY

1.0 Introduction

1.1 21 AK 11 is a large, multi-component archaeological site at the northwestern end of Big Sandy Lake Reservoir, where it straddles its outlet, the Sandy River (a tributary to the Mississippi River which it joins less than 700 m further west/northwest). The site is contained within the Sandy Lake Recreation Area which is administered by the U.S. Army Corps of Engineers, St. Paul District. As the recreation area is completely surrounded by either low ground, marsh or open water, its boundaries appear to coincide with the maximum extent of the site area.

1.2 Big Sandy Lake constitutes one of the Mississippi Headwaters Reservoirs and is regulated by a dam that was built by the Corps in 1895 across the Sandy River. The subsequent four feet rise in normal water level has doubled the size of the lake which now covers an area of more than 16 square miles. Raised lake levels, with subsequent fluctuations as well as increased wave and wind activity during high water conditions, have caused considerable shoreline erosion in exposed areas; elsewhere, in more sheltered locations, extensive marshes have formed in the shallow waters above submerged lowlands like those surrounding the Sandy Lake Recreation Area.

1.3 In its dual capacity as a service and administrative area for the dam as well as a quite intensively used recreation facility, the site has been and continues to be subject to a variety of construction impacts that endanger the integrity of the archaeological deposits.

1.4 The existence of the archaeological site has been well known since the late 1800's when prehistoric artifacts were unearthed both in the town of Libby (which preceded the Corps complex at this location) and along the banks of Sandy River (during the construction of the dam). Archaeological investigations, however, had been rather minimal prior to 1985:

In 1975, a University of Minnesota team had performed some formal testing and surface inspection of disturbed areas in order to evaluate the impact caused by recent construction of a sewage treatment plant, a new maintenance shed and a comfort station;

all results had been positive, producing historic and prehistoric evidence both within the disturbed areas and in adjacent, undisturbed context.

Two years later, parts of the site had been tested by a Science Museum of Minnesota team in connection with the 1977 shoreline survey of the Big Sandy Lake Reservoir. Several of the tests had proved positive, including three in areas later scheduled to be impacted by construction in 1985.

1.5 Because of the limited scope of the 1975 and 1977 investigations, the vertical and horizontal extent of the cultural deposits, as well as the degree of overall disturbance due to historic and recent impact, all remained poorly identified. In order to remedy this situation and fulfill its legislated responsibilities regarding the identification and protection of cultural resources, the Corps contracted for two archaeological investigations at AK 11 during 1985:

Phase II testing of areas to be affected by various undertakings scheduled for the same year--the relocation of the existing access road, the construction of a new parking lot and boat ramp, and the development of a swimming beach (Contract Number DACW37-85-M-1141, awarded to Archaeological Research Services on June 3, 1985). The main objective of this testing would be to determine a) whether archaeological evidence earlier reported in or near the 1985 project areas was indigenous to the latter or had been brought in with fill for the 1951 construction of the access road, and b) whether such an indigenous cultural deposit, if found, would have enough integrity, research potential and archaeological significance to make AK 11 eligible for the National Register of Historic Places (NRHP).

a second contract (DACW37-85-M-1488) which, in response to the results of the first, expanded the scope of the investigation to include the entire recreation area and to involve enough Phase I and II testing to a) determine the full horizontal and vertical extent of the AK 11 deposits; b) delineate where past Corps undertakings had/had not disturbed the cultural evidence; c) estimate to what degree such disturbances had damaged the cultural evidence and diminished the research potential of the site; d) determine whether AK 11 would be eligible for nomination to the NRHP, and e) provide the Corps with specific recommendations for the future

management and protection of the site, should it be found eligible for the Register. This second step was undertaken during August 1985.

1.6 Archaeological Research Services (ARS) of Minneapolis, Minnesota, performed both investigations, with Christina Harrison, Director, as the principal investigator, aided by three graduate students from the University of Minnesota and Hamline University, St. Paul. Grant Goltz, Consulting Soil Scientist, performed a soil investigation and provided interpretations of the degree to which the cultural deposits had been affected by past Corps undertakings. Two volunteers assisted with tasks that did not require professional training (screening prior to sorting, labeling, backfilling etc.). The evidence was subsequently cleaned and sorted by ARS staff. Christina Harrison was responsible for the lithic and ceramic attribute analysis as well as for the preparation of the final report. Christy A.H. Caine, State Archaeologist, was consulted regarding some of the ceramic evidence while Orrin Shane at the Science Museum of Minnesota assisted with the faunal analysis.

1.7 Retrieved evidence, as well as field records, have all been curated at Hamline University, St. Paul.

1.8 The methods and results of both investigations have been combined in this report. To allow for a more complete description of the site within one volume, the report also includes brief summaries of the results of the 1975 and 1977 investigations.

2.0 Environment and Cultural Background

2.1 Section III of this report describes the environment and known cultural history of AK 11 and its vicinity. Topographic variety as well as a variety of wooded habitats provided a considerable range of plant and wildlife species of economic importance to prehistoric Indian groups. Past use of AK 11 was probably also influenced by its location along the Sandy River-Sandy Lake-Prairie River-Savanna River (and Portage)-St. Louis River route which was a crucial link between the Mississippi and the Great Lakes region.

2.2 Nearly fifty archaeological sites have been recorded adjacent to the Big Sandy Lake reservoir. Together, they have yielded evidence spanning almost the entire prehistoric and early historic periods (all except the initial Early Prehistoric). Table 3 summarizes the cultural components identified so far on Big Sandy sites.

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The majority of them are Late Prehistoric; many of those were apparently associated with wild rice harvesting. Only a couple can be ascribed to the Middle Prehistoric (Initial Woodland) period; only about half a dozen can be dated to the end of the Early Prehistoric (Archaic). It is possible, however, that a number of such early Archaic sites, frequently located inland on older beach ridges, may have escaped discovery so far as survey coverage around the reservoir generally has been limited to the present shore. Five of these sites have also produced historic evidence connected with the historic Ojibwa, with the fur trade, with logging or with early Euro-American settlement.

2.3 Of all these sites, AK 11 appears to contain the highest number of cultural components. Diagnostic evidence for the prehistoric period includes a very early type of biface (probably early Archaic or even late Paleo-Indian), copper objects of apparent Late Archaic derivation, some Middle Woodland Malmo ceramics, possible also some St. Croix and Onamia sherds from the transitional late Middle to early Late Woodland phase and, finally, fairly abundant evidence of Late Woodland habitation (mostly Blackduck, possibly some Sandy Lake ceramics). A British gunflint may date from the fur trade or the historic Ojibwa occupation; later, indirect evidence connects this site with logging and late 19th century use of the river. Most of the historic evidence, both artifacts and some structural remains, can be traced to the first Euro-American settlement on this spot, the old town site of Libby.

3.0 Research Approach and Field Methodology

3.1 While informant reports and the results of earlier investigations indicated the presence of prehistoric and early historic evidence across most of the Sandy Lake Recreation Area, it was not at all clear to what degree these archaeological deposits had been impacted by late 19th and early 20th century settlement or by various undertakings by the Corps. Nor was there sufficient information to indicate, with any certainty, either the full range of cultural components present or their perimeters.

3.2 A combination of archival research, soil coring and shovel-testing was used to reconstruct the nature and extent of disturbance from historic land use. As a first step, a composite map was prepared from a series of Corps maps and project plans prepared between 1920 and 1985 (Figure 8). This map shows the present layout of the

Corps property as well as a) the locations of a number of demolished structures formerly associated with the town of Libby and the early days of Federal ownership, and b) the location of subsurface features such as sewer and water lines. In addition, the map shows several areas where past borrowing or deposition of fill has been significant enough to be indicated on project plans.

3.3 The draft version of the composite map was then used both as a guideline for the field investigations and a basemap for the plotting of the results. Two aspects of the field research--the soil investigation and the shovel-testing--then served to verify or modify the archival information and also to identify other soil anomalies that resulted either from life in historic Libby or from small scale, unscheduled and unrecorded projects undertaken by the Corps.

3.4 The soil investigation was performed by Grant Goltz, Consulting Soil Scientist. His methods have been described in Appendix C; his observations and conclusions have been translated into maps that also show the locations of soil corings and transects (Figures 12, 15 and 26). In addition, the resulting information about the extent and nature of past disturbance has been added to the large composite map (Figures 8, 10, 13 and 16).

3.5 Shovel-testing was performed at 10-15 m intervals and spaced in a linear fashion along fairly narrow ridge crests, in a grid fashion across wider, more level uplands. All locations were plotted on the large, composite map and have also been recorded verbally and in more detail in Appendix E. Test formats are described in Section IV.

3.6 In order to obtain better stratigraphic and horizontal control and, possibly, reveal larger and more distinct segments of buried features six larger, formal test units were then excavated adjacent to the most interesting of the shovel-tests. Methods have been described in Section IV.

4.0 Results of Field Investigation

4.1 For ease of reference, the site was divided into four subareas as shown on Figure 3.

4.2 Area A (northern part of Recreation Area): a rolling glacial ridge north of the river and dam structure--presently used as a campground. During the late 19th and early 20th centuries, this ridge was the location of

several residences and one school. A small portion was used as a source of gravel during the 1951 construction of a new access road south of the dam. In 1977, three shovel-tests put in on the crest, at rather large intervals, had proven largely negative, producing only a few historic items from the old school. More intensive testing in 1985 (24 shovel-tests and one formal 1 m² unit), as well as complete surface inspection across all disturbed areas, indicated that:

- a fairly thin but consistent scatter of cultural material extended across all reasonably high and level parts of the ridge;
- the bulk of this evidence is lithic, mostly debitage but also a few implements as well as some fragments of fire-cracked rock;
- the occurrence of ceramics is limited to the north central part of the ridge;
- there is evidence of fairly undisturbed living floors and work areas (as indicated by the formal test unit);
- most of the prehistoric evidence is located between 20 and 50 cm below the surface in what appears to be a largely undisturbed context; where such evidence was encountered higher up, the area had clearly been disturbed by fairly recent landscaping;
- there is a fair amount of historic evidence, all of it apparently connected with the late 19th and early 20th century occupation of this ridge, and most of it confined to the uppermost 20-30 cm of the soil in what appears to be the remnants of old trash dumps;
- the old school foundation is the only structural evidence left of the historic buildings that preceded the campground;
- evidence of later 20th century disturbance is limited to a) the well defined borrow area used in 1951, and b) fairly superficial landscaping of parts of the campground.

4.3.1 Area B: a rather narrow ridge which extends east as a peninsula between the south side of Sandy River and the northwestern part of the lake. Quite intensive formal testing by the University of Minnesota in 1975 and by the Science Museum of Minnesota in 1977 seemed to

eliminate the need for further Phase II testing in 1985, but the soil investigation was extended to this area in order to determine the extent of impact by late 19th and early 20th century use as well as more recent construction undertaken by the Corps.

4.3.2 In the western half of Area B, now occupied by a comfort station and pads for trailer parking, the 1970's investigations had encountered evidence of both historic occupation debris and 20th century landscaping in the uppermost 30 cm while prehistoric evidence had remained fairly undisturbed in the 20-25 cm horizon below. In the eastern half, used for tent camping only, the uppermost 35 cm yielded quite undisturbed and abundant evidence of a late prehistoric habitation as well as two oval depressions tentatively interpreted as the remains of late prehistoric or early historic dwellings with sunken floors. The 1985 soil cores confirmed the undisturbed character of the eastern half; in the western one, they indicated intermittent landscaping (grading and filling) within the camping area and quite deep disturbance near the comfort station and the road. On the whole, however, indications are that the major part of this ridge still retains quite intact and concentrated prehistoric and early historic use areas.

4.3.3 Because of an earlier proposal, since rejected, to move the existing boat ramp below the comfort station and replace it with a swimming beach, the initial 1985 investigation was extended to this area. Soil coring proved all more level ground in the project to consist of hard packed fill; the rest was considered too sloping to warrant testing.

4.4.1 Area C (northern part) had in the late 19th century been the original town site of Libby. Since the dam was built in 1895, it has housed the dam tender's residence and office as well as various maintenance buildings. As a result, most of the central part has been badly impacted by years of intensive use and many alterations (Figure 16). In 1975, the University of Minnesota team had found prehistoric evidence in areas disturbed by recent construction of a new maintenance building and a sewage treatment plant. The 1985 shovel-tests indicated considerable variability in the date and intensity of past land use:

The lower southwestern part which overlooks a well developed meander of the Sandy River yielded a thin scatter of historic and what appears to be late prehistoric evidence; presumably, the eastward shift

of the river channel would have eroded any earlier occupation levels that may have existed along this stretch.

The higher central part of the area produced evidence of repeated use--a fragmentary fish gorge of native copper, probably dating back to the Late Archaic, as well as ceramics representing several traditions of the Middle-Late Woodland transition, the Late Woodland and possibly also the protohistoric periods. Lithics included some Late Prehistoric projectile points and a British gun-flint; the diagnostic items were accompanied by chipping debris, grindstone fragments, numerous pieces of fire-cracked rock and burnt as well as unburnt bone fragments.

The northernmost part, much of which slopes gradually towards the river, yielded a sparse scatter of lithics, including a weathered biface similar to lithics found in late Paleo-Indian and early Archaic assemblages of northeastern Minnesota.

4.4.2 Although soil profiles indicated a fair amount of historic impact on the three areas just described, the disturbance seems to be rather patchy and frequently quite superficial. This would suggest that large portions of the cultural deposit have remained reasonably intact. This is not the case in the northwestern part of the ridge, i.e. the areas underneath and around the sewage treatment plant, the new maintenance building, the realigned access to both and the heavily landscaped yard in front of the dam tender's residence. A review of the 1975 report by the University of Minnesota team, of various construction plans on file at the Corps of Engineers St. Paul office, and of comments by Corps staff at the Recreation Area all indicate that extensive impact was caused by the construction of these facilities.

4.4.3 Southern Area C encompasses the low, level inland part of the ridge between the access road and the river. Most of the upper part of the deposit was disturbed by years of gardening as well as some grading and filling during the 1951 construction of the new access road. Testing produced evidence similar to that in the central part of Area C. Soil profiles and the presence of some features (a possible storage pit and two fire basins) indicated that 30 cm or more of undisturbed cultural deposit exists underneath the plow horizon.

4.5 The southern part of Area D, a level terrace adjacent to the lake, yielded evidence of quite intensive early prehistoric occupation with overlapping, fire-stained features and a dense scatter of debitage and fire-cracked rock, as well as some implements and fragments of bone and charred seeds. The evidence is clearly aceramic, probably Late Archaic, as suggested by finds of copper and what appears to be red ochre. The northern part of the terrace yielded a thinner scatter of lithics. The only ceramic evidence found so far in this area, sherds excavated by the Science Museum team in 1977, derived from a singular vessel and was found closer to the shore. The aceramic deposits of Area D date from a time of relatively high lake levels, when the terrace, like now, would have overlooked open water. For much of the later prehistoric period and until the construction of the dam, the adjacent part of the lake basin would have been very swampy, a fact which may explain the apparent paucity of later evidence. Much of the terrace was once part of the old garden mentioned above in connection with Area C. The most productive test units, however, were located well outside or just within the perimeter of the disturbed area and even within the latter, like in Area C, there is intact cultural evidence underneath the old plow horizon.

5.0 Results of Attribute Analysis

5.1 Chapter V, as well as Appendices D and F, describe the nature and provenience of the artifacts and ecofacts found during the 1985 investigations.

5.2 Most of the ceramic evidence came from Area C, a few sherds from Area A. Diagnostic rim and neck sherds appear to represent nineteen different containers: one Middle Woodland vessel, six from the late Middle-early Late Woodland transition, all but one of the rest distinctly Late Woodland; only one defied identification as to cultural affiliation. Out of a substantial number of body sherds, a few seemed to derive from Middle Woodland vessels, the rest from later varieties.

5.3 Some of the lithics are quite diagnostic: three ovate bifaces and one large side scraper, all fairly crude, all with equivalents in Early Prehistoric assemblages of northeastern Minnesota and adjacent parts of the Upper Great Lakes region; another, more refined biface which, judging by technique of manufacture as well as find context may be quite early, possibly Archaic; four Late Prehistoric triangular projectile points; a British gunflint. Others (two scrapers, a preform, a

thin flake knife) are of a more general type used widely for much of the prehistoric period. There are also a few retouched flakes, as well as some grind and hammer stones and nearly 400 pieces of debitage. Raw materials used for the prehistoric lithics would, in many cases, have been brought in from sources in northeastern Minnesota though some could have been found in local glacial deposits. Two types may have been traded or brought from the Dakotas, one from western Wisconsin.

5.4 Three items of native copper (a broken fish gorge, a hammered piece which may have been part of a knife, an unworked nugget), along with reported finds of spear points and other copper items near the dam, all corroborate other AK 11 evidence of a Late Archaic component.

5.5 Fragments of burnt and unburnt bone, as well as some fragmented carbonized seeds, were found in some of the 1985 units. Most were too small to be identified as to species, others suggest that deer, beaver, hare, some small rodents, turtle and fish played a role in the food economy. Fish bones were also reported from some of the 1970's units. Bone preservation appears to be good, at least in the later prehistoric levels.

5.6 Many of the excavation units yielded a considerable amount of historic evidence, most of it fairly recent trash associated with the late 19th and early 20th century occupation of the site. No attempt was made to analyze or tabulate this material.

6.0 Conclusions and Recommendations

6.1 The last section of the report summarizes the evidence regarding the condition of the cultural deposit and the sequence of past site use. It then considers the research potential and outlines half a dozen potential research topics to be considered for future investigations.

6.2 It is concluded that 21 AK 11--because of its geographical location, its unusually complex cultural record, and the fairly high integrity of large parts of the cultural deposit--ranks high among Big Sandy Lake sites in terms of both local and regional significance, and therefore ought to be considered eligible for the National Register of Historic Places. The section ends with a consideration of the site boundaries and a recommendation for public interpretation.

7.0 Project Expenses

7.1 The total budget for the two 1985 investigations was \$8188. Of this, \$5978 was spent on salaries while another \$728 covered food expenses and accommodation (during the field investigation, most nights were spent camping at the Recreation Area). The soil analysis cost \$600, clerical services \$636. The rest was spent on travel and supplies.

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I. INTRODUCTION

21 AK 11 is located within the Sandy Lake Recreation Area, which is administered by the U.S. Army Corps of Engineers (COE), St. Paul District. Situated in northeastern Aitkin County, approximately 110 miles north of the Twin Cities, 50 miles west of Duluth and 32 miles south/southeast of Grand Rapids (Figures 1 and 2), the recreation area is contained within Section 25, T50N, R24W (Figure 3). A more specific description of the project area and its surroundings will be given below in Sections III and IV.

21 AK 11 has been known since the late 1800's when prehistoric artifacts were unearthed both in the town of Libby, located at this spot, and along the river during the construction of the dam. Since that time, various undertakings on the recreation area have caused considerable disturbance within parts of the site, a fact noted by archaeologists during two earlier investigations (University of Minnesota in 1975, and by the Science Museum of Minnesota in 1977), see further in Section II. In order to fulfill its legislated responsibilities regarding the identification and protection of cultural resources (see Scope in Appendix A), the COE contracted for a cultural resources investigation in connection with undertakings scheduled for 1985:

- the relocation of the existing access road to its former (pre-1951) position;
- the construction of a new parking lot and boat ramp;
- the development of a swimming beach.

The purpose of that investigation was to determine, through Phase II testing: a) whether archaeological evidence earlier reported in the 1985 project areas was indigenous to the latter or derived from a borrow area used to provide fill for the 1951 construction of the new access road, and b) whether such an indigenous cultural deposit, if found, would have enough integrity, research potential and archaeological significance to make 21 AK 11 eligible for the National Register of Historic Places (NRHP).

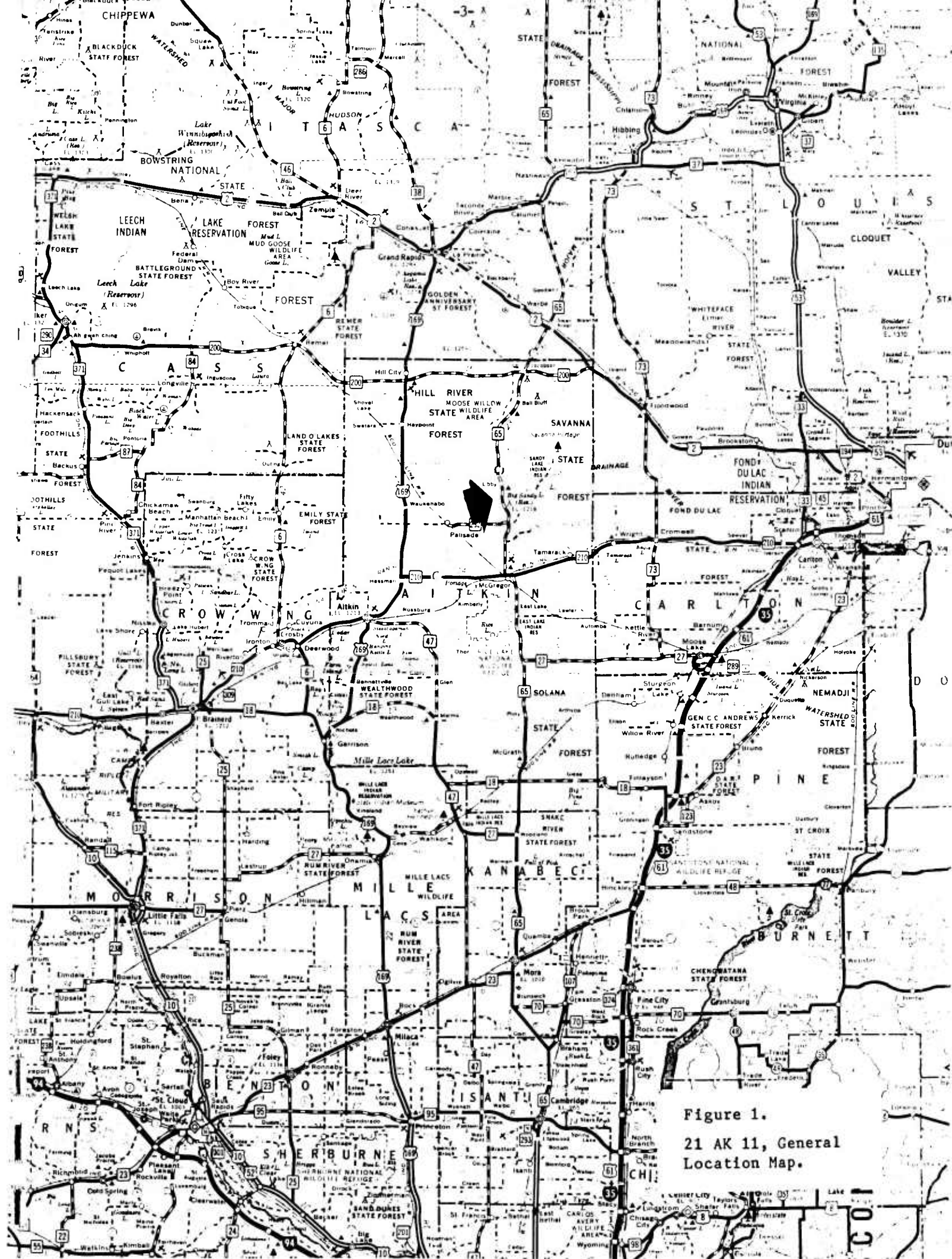
The results of this investigation, undertaken on 6/10-11/85, indicated that indigenous cultural deposits did exist in all but one of the proposed project areas and that significant portions of these deposits appeared undisturbed enough to yield features as well as stratified cultural material from several different periods of occupation. Subsequently, the scope of the

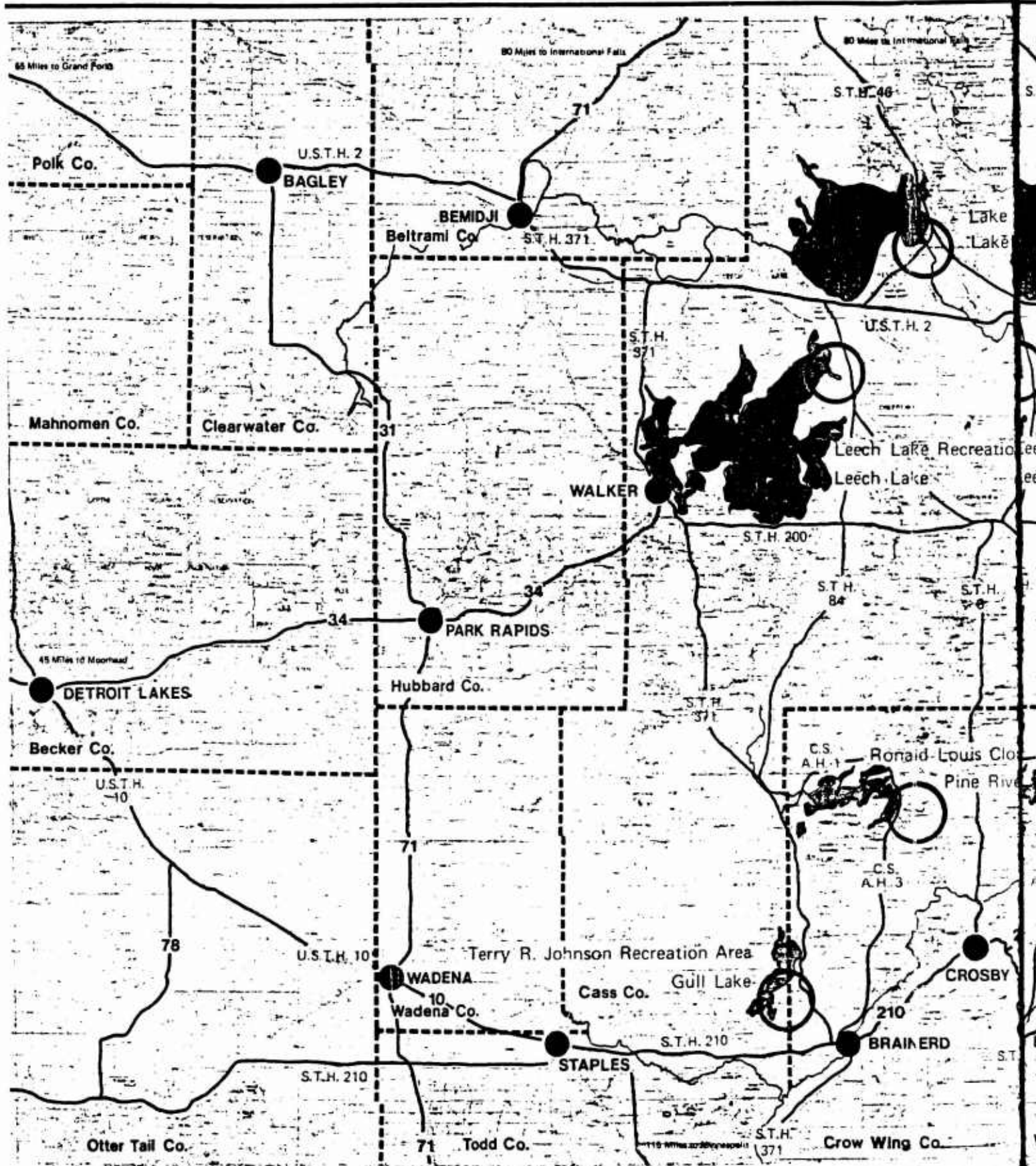
1985 investigation was expanded to include the entire recreation area and to specify enough Phase I and Phase II testing (as defined in Appendix A) to:

- a) determine the full horizontal and vertical extent of 21 AK 11 on lands within, (and if possible, immediately adjacent to) the COE administered property;
- b) delineate where past COE undertakings had/had not disturbed the cultural evidence;
- c) estimate to what degree such disturbance had damaged the cultural evidence and diminished the research potential of the site;
- d) determine whether 21 AK 11 was eligible for nomination to the NRHP;
- e) provide the COE with specific recommendations for the future management and protection of the site, should it be found to be eligible for the NRHP.

This second investigation was undertaken on August 1-5 and 20-21, 1985. Methods and results of both investigations are described below in Section IV.

Archaeological Research Services (ARS) of Minneapolis, Minnesota, performed both investigations, with Christina Harrison as the principal investigator, aided by three assistants--James Myster (University of Minnesota), Marcia Regan (Hamline University) and Susan Thurston (Hamline University)--see resumes in Appendix G. Grant Goltz, Consulting Soil Scientist, performed soil investigations on 6/10 and 8/2/85 and provided an independent interpretation of the degree to which the cultural deposit(s) had been affected by past COE undertakings. Two nonarchaeologists, Katrina Harrison and John Strot, assisted with tasks that did not require professional training (screening prior to sorting, labeling, transportation of equipment, backfilling). Later, in the laboratory, all the excavated evidence was cleaned and sorted by ARS staff. Christina Harrison was responsible for the lithic and ceramic attribute analysis as well as for the preparation of the final report. Dr. Christy Caine, State Archaeologist, was consulted regarding some of the ceramic evidence, while Dr. Orrin Shane at the Science Museum of Minnesota assisted with the faunal analysis.

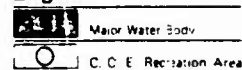




Master Plan for Public Use Development and Resource Management

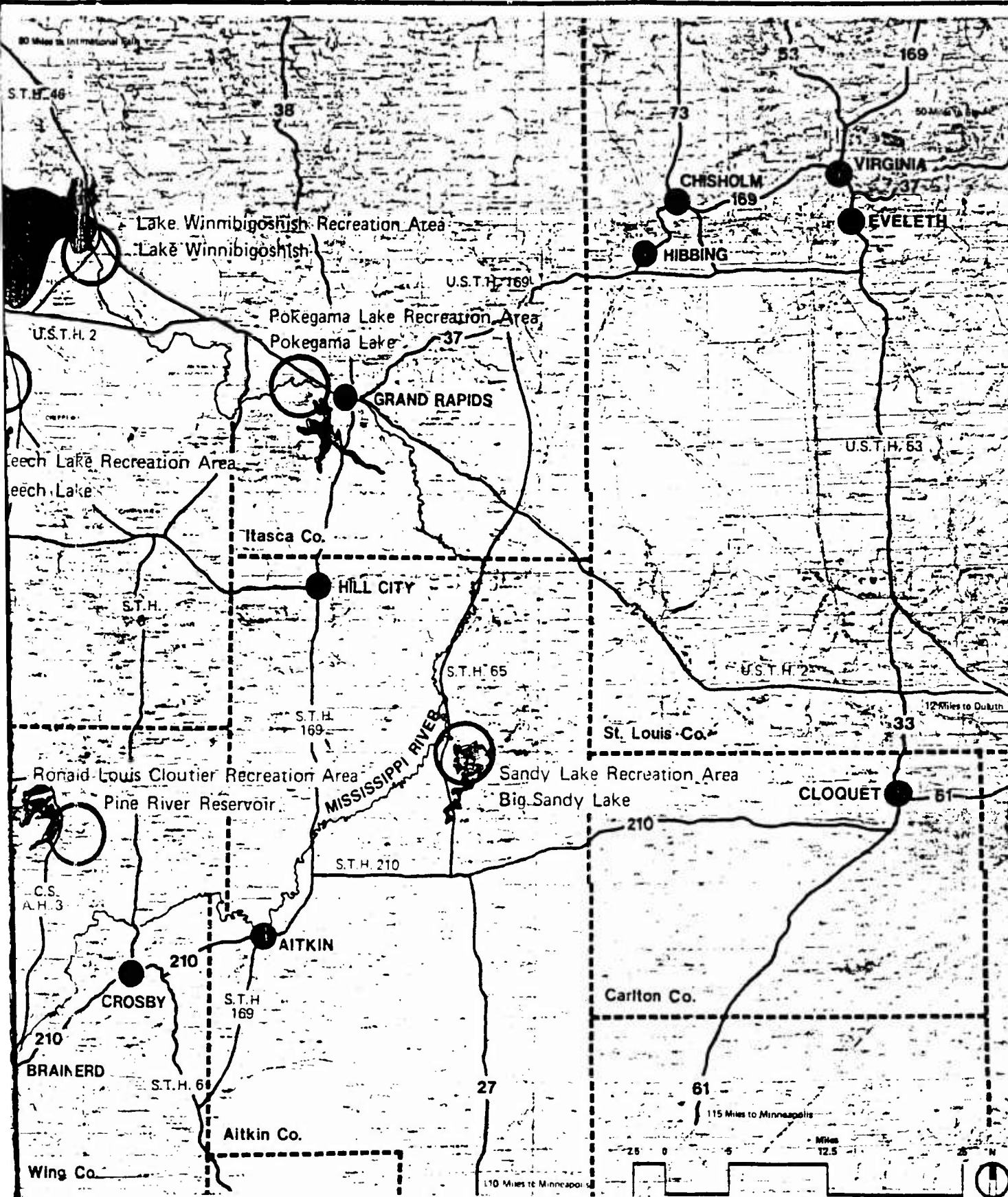
Mississippi River Headwaters Reservoirs

Legend



Department of
St. Paul District Corps
St. Paul, Minnesota

InterDes
Recreation Planner
Landscape Architect
Minnesota



Department of The Army
St Paul District Corps of Engineers
St. Paul, Minnesota

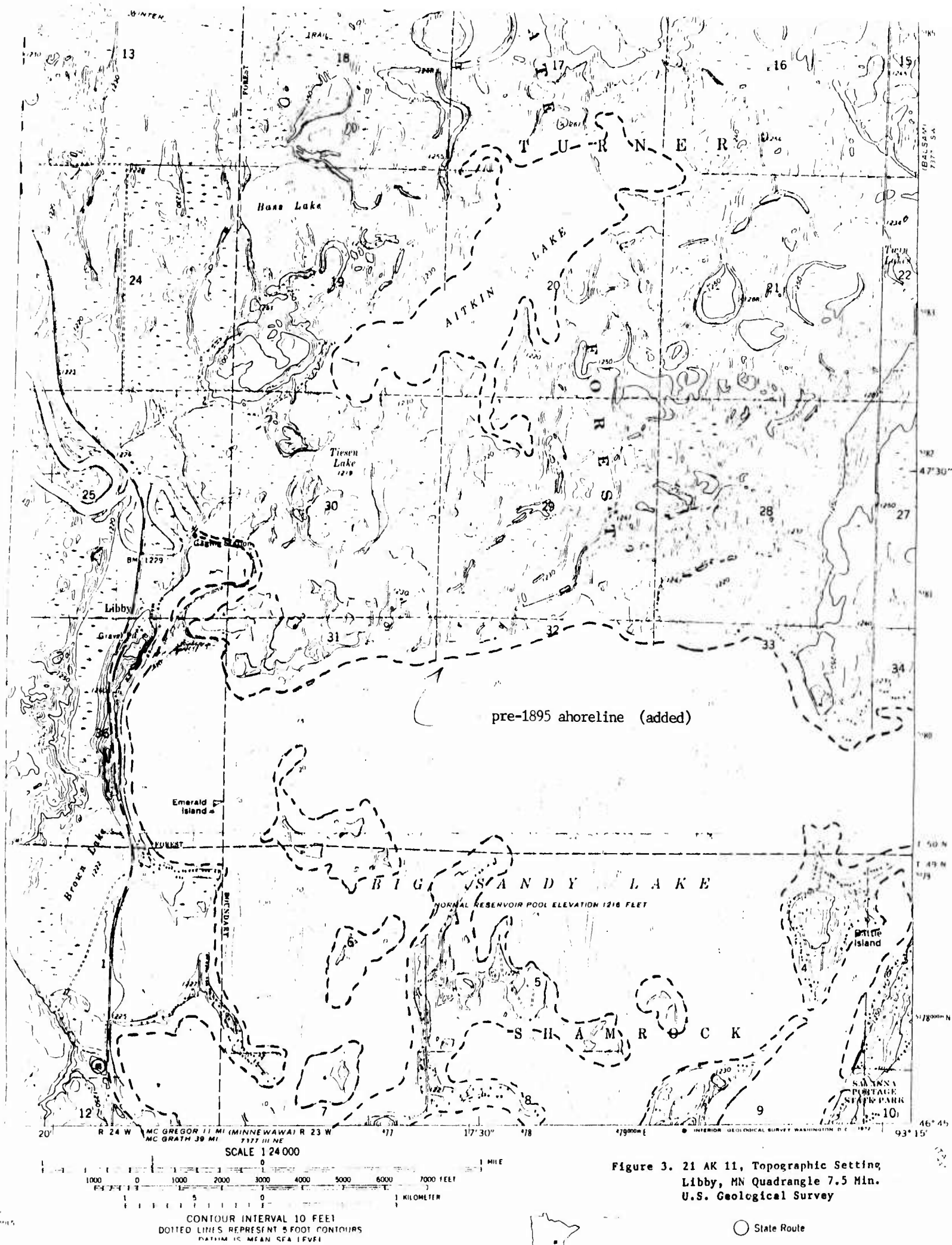
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Checked by Frank J. Martin
Submitted by _____
Approved by _____

InterDesign Inc.
Recreation Planners
Landscape Architects
Minneapolis, Minnesota

Date January 1977

Regional Location Map

Figure 2.
Vicinity Map for
Sandy Lake Recreation Area.



Retrieved archaeological evidence, as well as field records, have all been curated at Hamline University, St. Paul (Appendix F).

To allow for a more complete description of the site within one volume, the report includes brief summaries of the results of the 1975 and 1977 investigations.

II. PREVIOUS INVESTIGATIONS AROUND THE BIG SANDY LAKE RESERVOIR

Prior to the 1970's, little was known about the archaeology of the reservoir area. By 1898, Jacob V. Brower had located a number of mounds as well as six habitation sites around Big Sandy Lake and along the Sandy River; his investigation took place just after the construction of the dam (Brower 1898 and 1901). A quote from Warren Upham (Winchell 1899) indicates that the archaeological importance of 21 AK 11 was well known locally:

In the neighborhood of the outlet of Sandy Lake, which flows deviously about three miles to accomplish its one mile of distance between the lake and the Mississippi river, a few Indians still remain, holding this locality of the old trading posts as their latest place of abode and ownership in Aitkin County. There is little trace of any earthworks to show that this site was occupied by the mound-building people, though its natural beauty and advantages for fishing and hunting must have been as attractive then as now. Numerous arrow and lance points of stone, and several of copper, besides curved bands of copper which probably were worn as ornaments, have been found here on or near the surface by Mr. William L. Wakefield, the merchant and postmaster, who also showed me a copper spear-head, nine inches long, which was found in the mud beneath the river bed during the excavation for the dam.

In spite of such early reports, however, more than half a century would pass before 21 AK 11 became the focus for any professional archaeological explorations.

Some information about the reservoir area was later recorded by archaeologists Lloyd Wilford and Leland Cooper who made several field trips around the region and interviewed a number of local amateurs who had amassed quite extensive private collections by exploring the eroding shorelines during the 1920's-1960's. Amongst the

most active were Mr. and Mrs. Eugen Crolla, Mr. and Mrs. William Russ and Mr. Otto Zink. Cultural material from the Zink collection, which includes material from 21 AK 11 and nearby sites, is now on display in the visitor center at the Sandy Lake Recreation Area.

In 1969, limited excavations were carried out on another reservoir site (21 AK 9) by Charles Wattrall who also undertook some shoreline investigation (Wattrall 1969).

In 1973, the Center for Environmental Studies at Bemidji State University carried out an interdisciplinary study of the Mississippi Headwaters area, including some archaeological investigations (some field checking of already known sites as well as interviews with local informants). There was no attempt at systematic survey (Bemidji State 1973).

Only six sites had been recorded around the reservoir by 1977 (21 AK 4, 6, 7, 8, 9, and 11)--one fur trade post, a historic Ojibwa village, and a number of burial mounds.

In 1975, some test excavations were carried out at 21 AK 11 by a University of Minnesota (U of M) team directed by Eldon Johnson (Johnson 1975). The objectives were to determine if the construction of a comfort station as well as a new maintenance building and a sewage treatment plant had disturbed any archaeological deposits. Five formal test units were excavated around and east of the comfort stations, all along the crest of a narrow peninsula between the south side of Sandy River and the northwestern part of Big Sandy Lake. All produced historic as well as prehistoric material, partly from an undisturbed context (see below in Section IV). Surface reconnaissance around the other construction areas proved positive as ceramic fragments and lithic debitage was noted in the backfill piles.

Descriptions of the test units and the results have been included with the discussion of the 1985 investigation (Section IV).

The cultural material that was excavated by the 1975 team has been accessioned under U of M Archaeological Accession number 772.

More comprehensive and systematic shoreline surveys were sponsored by the Corps in 1977 and 1982. During August and September, 1977, a team from the Science Museum of Minnesota (SMM) directed by G.J. Hudak, with T. Ready as field assistant, investigated a total of nearly 70 miles

of reservoir shoreline. Thirty-five archaeological sites were documented through surface collecting, test excavations and interviews with local collectors. Twenty-one of these sites were described as seriously affected by shoreline erosion (Hudak and Ready 1979).

As part of the SMM survey, a total of 14 formal and informal test units were put in across 21 AK 11. All were screened through 1/4 inch hardware cloth; formal tests were taken out by levels (10 cm), informal ones not. Six of the tests proved positive, including three in the areas scheduled to be impacted by the 1985 developments. The recovered evidence will be described below in Section IV. Field notes and cultural materials have been accessioned under number SMM-A77:24:5.

In 1982, the second shoreline investigation was carried out by another U of M team, with Guy Gibbon as the principal investigator and Terri Leistman as field director (Gibbon and Leistman 1983). It focused on areas that the 1975 team had not been able to investigate due to bad weather and landowner restrictions. A total of 15 sites or findspots were identified and another 19 sites or findspots were reported by not verified. Only one of these localities was found to be threatened by erosion.

A 1981 field school, headed by Guy Gibbon, performed investigations at 21 AK 7 and 9 as well as parts of the Savanna Portage northeast of Big Sandy Lake. This was followed by further survey work along the portage in 1982 and 1983.

III. ENVIRONMENTAL SETTING; CULTURAL BACKGROUND

Physiography and Vegetation

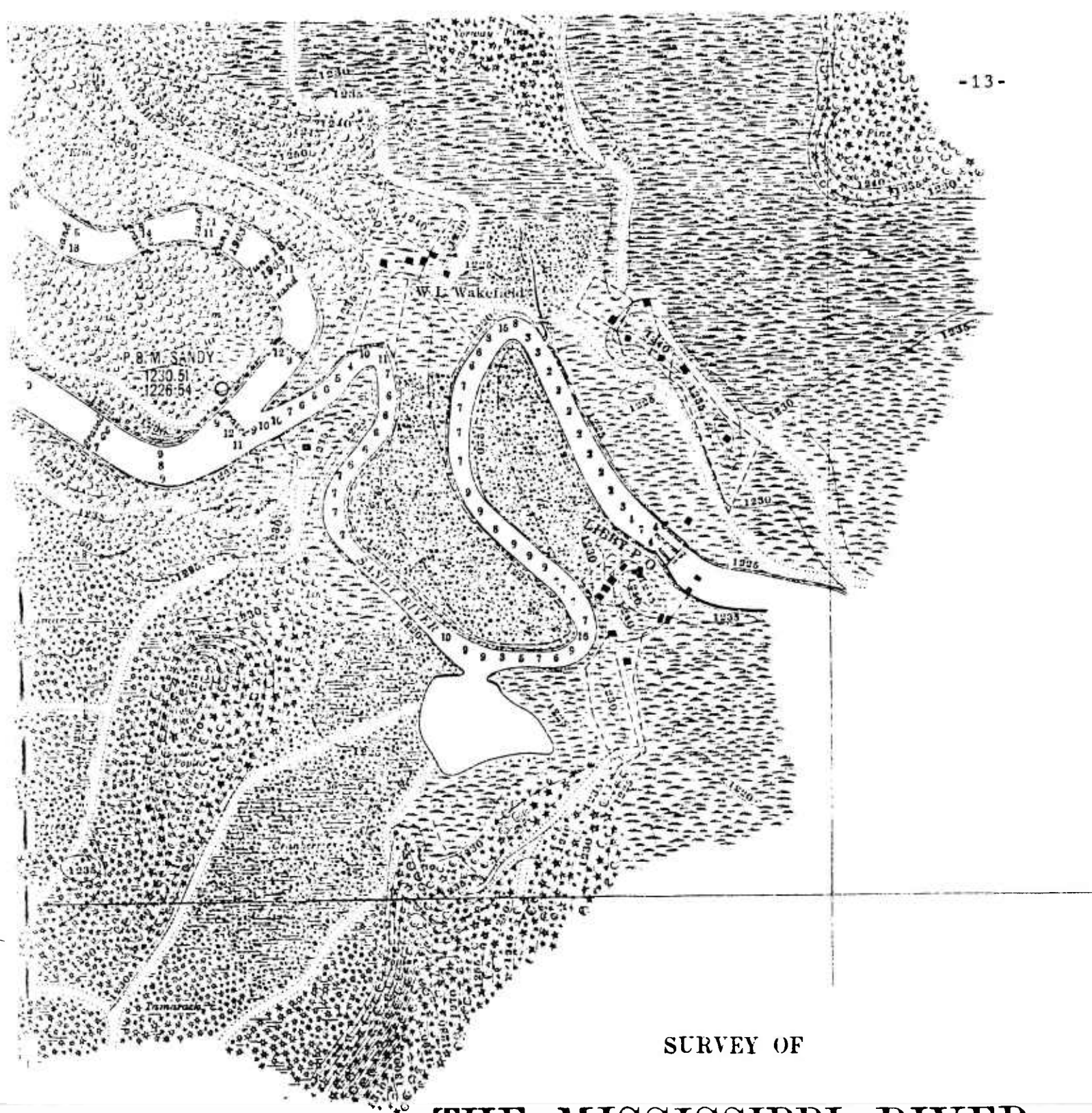
The Big Sandy Lake reservoir is located on the edge of a physiographic region identified as the Sugar Hills-Mille Lacs Moraine Area (Wright, H.E. 1972:568), a scatter of moraines extending from Mille Lacs Lake north to the Grand Rapids area and northeast (along the west side of the Glacial Lake Aitkin basin) to the Sandy lake and Jacobson areas. It was deposited during the late Wisconsin glaciation, mainly by successive advances of the Superior lobe from the northeast (reddish sandy and stony glacial till), but these deposits are sometimes overlain by a thinner layer of calcareous yellowish gray till deposited by the eastward trending St. Louis sublobe of the Des Moines lobe. The resulting landscape constitutes a patchy scatter of terminal moraines and

proglacial lakes, till plains and various outwash deposits (Ojakangas and Matsch 1982). The adjacent basin of Glacial Lake Aitkin forms a rather level expanse of low uplands and marshes across which the Mississippi River has cut a very meandered course.

Less than half a mile east of the Mississippi lies Big Sandy Lake which occupies an ice-block basin formed during the final retreat of the Wisconsin glacier around 12,000 B.P. It is connected to the Mississippi by its outlet, a short and very meandering stretch of the Sandy River, which was reduced in length by about a third through the inundations that followed the construction of the dam. Figure 3 shows the present topography of the area surrounding 21 AK 11 and the northwestern part of the lake. The pre-1895 shoreline has been added (copied from the main map in Gibbon and Leistman 1983 which in turn is based on old plat maps). Figure 4 shows a smaller segment of the area, as mapped by the Mississippi River Commission in 1898-1900. Figure 5 is a 1888 Corps map with both the natural and the projected reservoir shorelines indicated (based on an estimated rise in water level of 8 feet). The actual increase in normal water level since 1895 has been 4 feet. The resulting inundation has connected Big Sandy with formerly separate Aitkin Lake and widened the lower flowage of its main tributary, the Prairie River--in all, the lake area has doubled in size from approximately 8 square miles to more than 16 square miles.

Although the present normal pool elevation is 1216 feet above mean sea-level, water levels frequently fluctuate within the 1214 to 1218 feet range. The rise in lake level, with subsequent fluctuations as well as wave and wind activity during high water conditions, has caused very considerable shoreline erosion in exposed areas; elsewhere, in more sheltered locations, extensive marshes have formed in the shallow waters above submerged uplands.

At present, the reservoir area is located within a mixed conifer-hardwood environment--a transitional vegetation zone with increasing representations of deciduous species towards the south/southwest and of Boreal conifer species towards the north/northeast. Predominant tree species on the uplands are white, red and jack pine, as well as fir, spruce, oak, maple and basswood; elm and ash are more prominent in lower areas along the lake. Table 1 shows the distribution of these species across different types of terrain, along with their associations of shrubs and



SURVEY OF

THE MISSISSIPPI RIVER

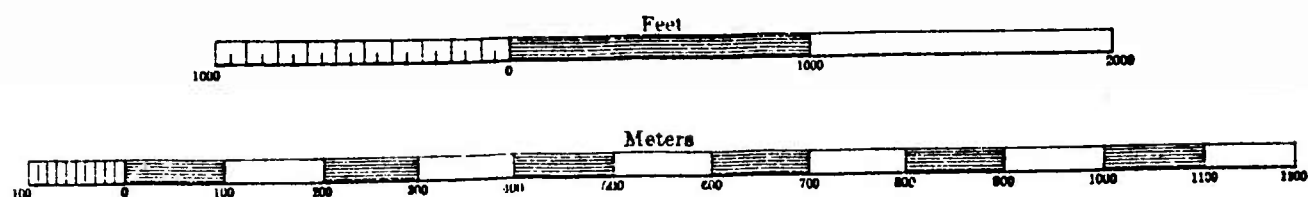


Figure 4. Excerpt from the Mississippi River Commission Map of 1898-1900

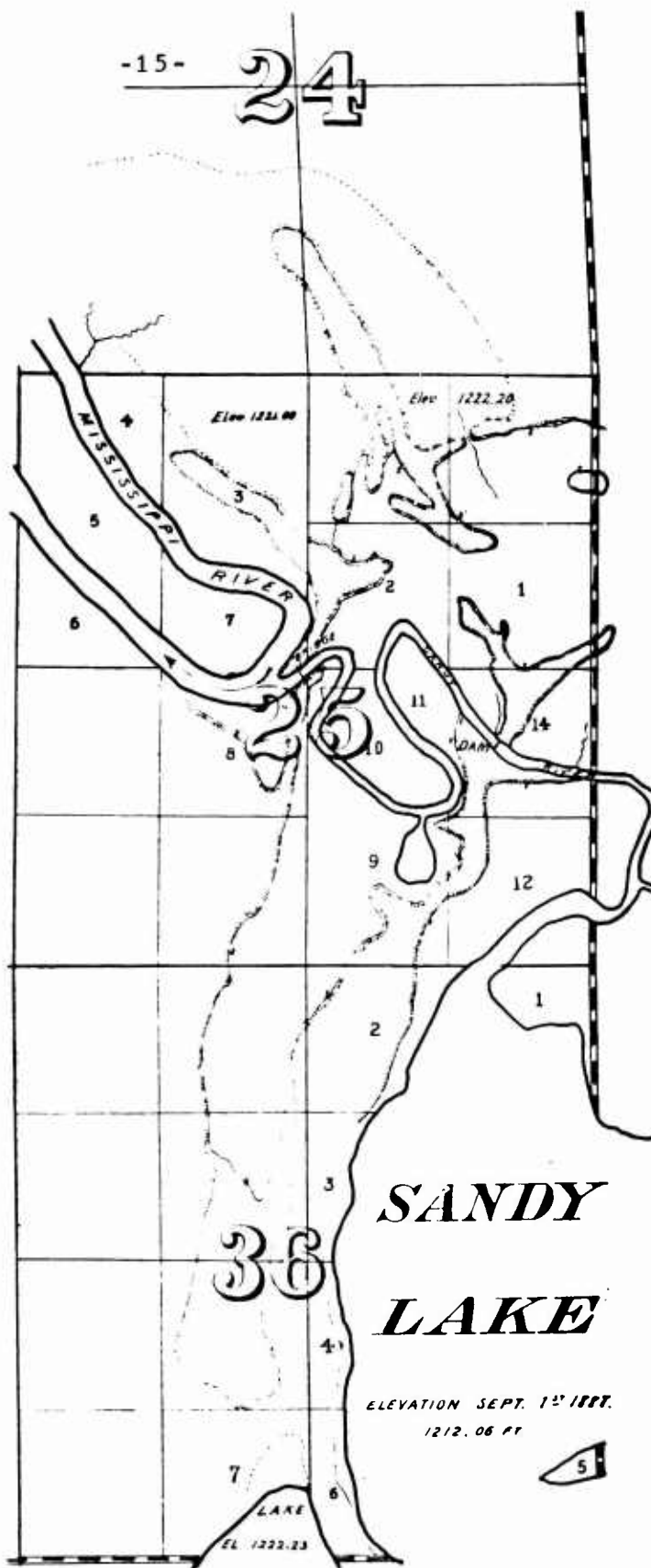


Figure 5. Excerpt from Map of U.S. Sandy Lake Reservoir Survey Showing 8 Feet Contours (—) above Existing Lake Level (—). From Survey Made September 1st, 1887 by John Cullen, Asst. Engineer, Under Direction of Major Chas. J. Allen, Corps of Engineers.

	Site #1	Site #2	Site #3
Descrip- tion:	Elm-ash community on low ground	Maple-basswood com- munity with elm-ash between it and the lake	Pine-mixed hardwood stand grading to maple-hardwood
Trees:	American elm Green ash Trembling aspen Northern red oak Bur Oak Basswood	Sugar maple Basswood American elm Green ash Northern red oak Bur oak Ironwood Trembling aspen Balsam poplar	Norway pine Jack pine Paper birch Northern red oak Sugar maple Basswood Trembling aspen American elm Large-toothed aspen Ironwood
Shrubs:	Hazelnut Round-leaved dogwood Downy arrowwood Poison ivy Wild grape	Hazelnut Black currant Juneberry Chokecherry Poison ivy Sandbar Willow Bush honeysuckle Virginia creeper	Poison ivy Hazelnut Round-leaved dogwood Chokecherry Black raspberry Smooth wild rose Bush honeysuckle Juneberry Downy arrowwood
Herbs:	Wild sarsaparilla Early meadow-rue Violet Large-leaved aster Red baneberry Star-flowered Solomon's seal Snakeroot Giant goldenrod Canada anemone Northern bedstraw Carrion flower Hog peanut	Pennsylvania sedge Large-leaved aster Northern bedstraw Bracken-fern Wild pea Bellwort Hairy Solomon's seal Hog peanut False Solomon's seal Snakeroot Br.-leaved goldenrod Small-flowered crowfoot Hepatica Sweet cicely	Columbine Star-flowered Solomon's seal Pennsylvania sedge Northern bedstraw Wild lettuce Hairy Solomon's seal Wild lily-of-the valley Wild sarsaparilla False Solomon's seal Large-leaved aster Giant goldenrod

Table 1. Vegetation around Big Sandy Lake (listing trees and shrubs in approximate order of importance; only prominent herbs noted). Bemidji State University 1973.

<u>Years Ago (B.P.)</u>	<u>Dominant Vegetation</u>	<u>Climate</u>
1. c.1000-3000	<u>Pine forest</u> : white pine with a red and jack pine, birch, and alder mixture	cooler and moister (resembles the present climate)
2. c.3500-7770	<u>Oak savanna</u> : oak with grasses and sage in forest openings. Some patches of xeric deciduous forest with birch, alder, elm, and ironwood in small numbers.	warmer and drier; the Thermal Maximum occurs c. 7000 B.P.
3. c.7770-10,000	<u>Jack Pine forest</u> : jack pine with birch, alder, elm, and oak.	warming climate and extinction of Pleistocene megafauna
4. c.10,000-12,000	<u>Spruce parkland</u> : spruce with birch, oak, elm, aspen, and sagebrush in park-like openings	cool-moist; Pleistocene megafauna are present.

(The gradual retreat of the ice mass begins c. 13,000 B.P., and Big Sandy Lake forms as remnant ice blocks melt c.12,000 B.P.)

Table 2. Postglacial Climate and Vegetation in Big Sandy Lake Region.
From Gibbon and Leistman 1983.

herbs (from Hudak and Ready, 1979, in turn based on Bemidji State 1973).

During the late 1800's, before the main impact of logging and Euro-American settlement, aspen-oaklands (with scattered oaks and elms, ash and basswoods) were predominant along the north, west and southwest shores, with some jack pine barrens further inland. Along the east side, and at the northwesternmost corner of the lake, aspen-birch-conifer subclimax forests (with white and red pine, balsam, fir, birch, spruce and white cedar) predominated on the uplands, again with some jack pine barrens inland. River-bottom forest (elm, ash, oak, basswood, soft maple, willow, aspen, etc.) along the Mississippi River and expansive conifer bogs and swamps, some very large, complete this picture which is based on Marschner's compilation of land survey data (1974).

The aspen-oak lands, the aspen-birch-conifer associations and the jack pine barrens were all typical of uplands exposed to periodic, natural ground fires (Heinselman 1974). Logging during the late 19th and early 20th centuries (mostly of the east and south sides of the lake), followed by settlement and the suppression of forest fires, brought about a shift in climax vegetation to a maple-basswood association rather than the earlier pine forest climax which had predominated because of its greater tolerance of ground fires and open, unshaded conditions.

The rise in lake level and the surrounding water table would initially have caused some shifting of plant communities but no drastic change in the general composition of the surrounding habitats. Subsequent settlement and lakeshore development have probably had a greater impact--major sections of the reservoir shoreline has been cleared, built up and landscaped.

Table 2 summarizes the postglacial vegetation sequence with concomitant changes in climate. It is based on pollen data from Rossburg Bog, Kotiranta and Jacobson Lake (copied from Gibbon and Leistman 1983).

Regional Cultural Sequence

Although much of the information we have about prehistoric and early historic cultural resources in north-central and northeastern Minnesota has been gained through reports from informants, particularly amateur collectors, and from the results of small scale cultural resource reconnaissance surveys, there have been a few

more comprehensive and coordinated regional attempts at systematic site survey:

- the Mississippi Headwaters Cultural Resources Inventories performed by the University of Minnesota and the Science Museum of Minnesota under contract with the U.S. Army Corps of Engineers (Johnson et al. 1977 and Johnson 1979).
- a stratified sampling survey within the Nokasippi drainage in southern Crow Wing County, part of the Minnesota Statewide Archaeological Survey (Birk 1979);
- a regional sampling survey in the Voyageur National Park, Koochiching and St. Louis Counties (Gibbon 1977);
- a series of cultural resource surveys on the Superior National Forest in Cook, Lake and St. Louis Counties (Peters et al. 1982, 1983 and 1984);
- similar projects on the Chippewa National Forest, Beltrami, Cass and Itasca Counties (various--reports on file at Supervisor's Office in Cass Lake);
- a stratified sampling survey in Pine and Kanabec Counties, part of the Minnesota Statewide Archaeological Survey (Harrison 1978).

Some archaeological investigations of specific sites or archaeological districts have contributed information of regional significance:

- the excavations at the Itasca Bison Kill Site, done using an interdisciplinary approach and with an emphasis on environmental and economic factors in the prairie/woodland border area (Shay 1971);
- a number of surveys and excavations in the Mille Lacs area by Wilford, Cooper, Johnson, Bleed and others (Streiff 1972);
- the analysis of the Redepenning collection from the Island Lake Reservoir area near Duluth (Steinbring 1974; Harrison, Hill et al., no date).

With the exception of the Itasca site, Voyageur National Park and the northern part of Superior National Forest, all of the areas mentioned above are located within a 30 to 60 mile radius of the Big Sandy Lake Reservoir.

These projects, as well as informant reports and smaller cultural resource investigations have all added a number of sites to the Minnesota State Site File and they have also generated a considerable amount of information regarding the preferred site locations and the cultural sequence of north-central and northeastern Minnesota. They have also resulted in some more tentative interpretations and hypotheses regarding site functions and settlement/subsistence patterns. What is largely lacking, so far, is detailed knowledge about particular sites as comparatively few have been subjected to more intensive testing and evaluation.

The following summary of the cultural history of northern Minnesota (with references also to adjacent parts of western Ontario and east-central Minnesota) is based on the results of the research mentioned above as well as on more specific local studies of a) the late Woodland Blackduck manifestation (Evans 1961; Lugenbeal 1979), b) the Middle Woodland Laurel Tradition (Lugenbeal 1976; Anderson 1979; Stoltzman 1973), and c) the late paleo-Indian/early Archaic Reservoir and Lakehead complexes of northeastern Minnesota and western Ontario (Fox 1980; McLeod 1978 and 1980; Steinbring 1974; Harrison, Hill, et al., n.d.).

In this summary, most of the emphasis will be on cultural traditions and characteristics that appear to have some bearing on the 21 AK 11 assemblage--a multi-component site, AK 11 appears to have been inhabited or visited quite frequently over the last 4-5 millenia.

10,000/9000 B.C. -7000/6000 B.C. (Terminal Glacial & Early Prehistoric)	With the last glaciers gone, grassland adapted <u>paleo-Indian</u> groups of bison hunters roamed northwestern Minnesota. Other groups, gradually adapting to forested environments and subsisting on less specialized hunting as well as fishing, seem to have occupied wooded areas in the east; cultural evidence such as camp and quarry sites in the lake district north and northwest of Thunder Bay suggests the presence of human groups on the Canadian Shield by at least 7000 B.C. (Fox, 1980; McLeod 1978:5; Wright 1972:13-20). A possible late paleo-Indian component appears to be present in the Reservoir Lakes area northwest of Duluth (Steinbring 1974:64-73); a related cultural complex
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is known from the Thunder Bay area (the Lakehead Complex, Fox 1980). Paleo-Indian evidence has also been reported from the Mississippi Headwaters region (Johnson et al., 1977:25-26). A number of paleo-Indian projectile points of the Folsom type as well as the later Plano types have been found in east-central Pine County, Minnesota, particularly along the Snake River drainage (Caine 1974:55-59; Harrison 1978); similar finds of Plano points are also common through northeastern Minnesota. Throughout this period, the climate became warmer and drier; boreal spruce forest was replaced by pine and birch. Moose, woodland caribou, hare and beaver were hunted.

7000/6000 B.C.
-ca. 3000 B.C.

The dry and warm climate of the post-glacial altithermal continued along with associated pine forests and the presence of small and scattered groups of hunters and fishermen. To the north, a number of sites in Ontario indicate the presence of early Shield Archaic out of a late paleo-Indian culture base (Wright 1972:33-36). Narrows on lakes and rivers were favored campsites as well as natural caribou crossings, a fact which suggests that this animal was of considerable economic importance. Sites are generally distributed along major waterways as well as on interior lakes and islands, locations which indicate the importance of fishing and also the use of some kind of water craft, possibly already the dugout canoe. Chipped stone tools similar to the lanceolate points, bifacial knives (preforms) and large endscrapers typical of the Shield Archaic and Lakehead Complexes continued to be used in northeastern Minnesota and northern Wisconsin (Steinbring 1974:64-73). The bison kill site at Lake Itasca, near the source of the Mississippi River, dates from approximately 7000 to 5000 B.C. and gives an indication of Late paleo-Indian/early Archaic lifeways

near the prairie-woodland transition--a rather diversified big game/small game hunting and gathering economy relying on seasonal movements and scheduling (Shay 1971).

Characteristic of the Archaic period throughout the woodlands of northeastern and east-central Minnesota was an increasing reliance on broad spectrum exploitation of the different resources and habitats described earlier as well as an increasing diversification of technology for hunting, trapping, fishing, foraging, woodworking and plant processing. Chipped stone, particularly projectile points and wasteflakes, still predominate the cultural record but the use of pecked and ground stone tools seem to have caught on quite rapidly. Softer stone (shale, catlinite) was carved into atlatl weights, pipes and ornaments. Towards the end of the early Archaic, native copper began to be cold hammered into tools and ornaments. There are occasional finds of carved bone and antler objects. As in the preceding late paleo-Indian period, the frequent use of non-local lithic raw materials suggests either seasonal quarrying expeditions or some form of fairly organized exchange.

ca. 3000 B.C.
- 500/400 B.C.

A cooler and moister climate encouraged the return and predominance of mixed conifer forests. Late Archaic groups continued hunting, fishing and gathering but were, as mentioned above, now also using native copper artifacts made by cold hammer beating. Subsistence practices seem to have become even more focused and seasonal: winter hunting, summer fishing and increasingly specialized and scheduled use of wild plants. Tools and weapons were now more varied and specialized than those of earlier periods: adzes, celts, gouges, grooved mauls, abraders, awls, knives, choppers, scrapers, punches, chisels, drills, wedges, net

and line sinkers and projectile points were made by grinding or flaking a variety of metamorphic, igneous or crypto-crystalline siliceous rock. Bone and antler were used for points, needles and harpoons.

The more substantial sites from the Archaic period are located on reasonably high and well-drained ground overlooking lakes, lake-stream or stream-stream junctions--they may well represent more intensively used base camps. There are also many smaller, aceramic sites characterized by only a few lithics, some firecracked rock, etc.; they are often located further away from such confluences (though usually near at least a minor source of water)--such sites may represent more intermittent or short-term camps associated with seasonal activities or simply travel from one point to another. Frequently, these sites are located somewhat inland, on ancient beaches created by higher lake levels than those of recent times (Goltz, n.d.). The Archaic is well-documented from a number of areas in northeastern and east central Minnesota as well as adjacent parts of Ontario and Wisconsin--within the Border Lakes region, as well as around the Mississippi Headwaters, the Mille Lacs region, the Snake River drainage (Pine and Kanabec Counties) and northern Wisconsin (Caine 1974; Harrison 1978; Johnson 1977; Salzer 1974).

ca. 500/400 B.C.
- A.D. 500

(Middle Pre-
historic)

Climate and vegetation were by now relatively similar to recent times. Early archaeological manifestations of the Woodland tradition are characterized by the introduction of burial mounds and ceramics represented by the Laurel tradition in northeastern Minnesota and by more clearly Havana-Hopewell influenced ceramic traditions in southern east-central Minnesota.

Laurel is described as a Middle Woodland manifestation adapted to the lake-forest regions of northern Minnesota, southern Manitoba and western Ontario. Laurel ceramics have also been reported from the northern part of the Mississippi headwaters (Lake Winnibigoshish, Leech Lake). Laurel ware has several distinctive characteristics: a smooth surface, grit temper, straight rim, unthickened and usually flattened lip, slight or no neck constriction, decoration confined to upper rim and neck and consisting of dentate stamping, bosses, punctates and incisions. These ceramics are often associated with burial mounds, some of which are very large, e.g. Grand Mound on the Rainy River. The economy was based on hunting and gathering as well as fishing. Associated artifacts include: toggleheaded antler harpoons, cut beaver incisors, copper artifacts, many flakes but few ground lithic artifacts (Lugenbeal 1977; Stoltman 1973). Dates to approximately 100 B.C. - 800 A.D.

The emergence of a mound building tradition suggests some important changes in social organization during this time, changes from a basically egalitarian hunting/gathering society to one characterized by incipient social stratification:

"First, only some of the Laurel people were buried in the mounds. Second, it probably took a large work force to build the mound. From these observations, we can suggest that some people of the Laurel culture deserved special treatment when they died. They may have been chiefs, priests or some other type of leader" (Peters 1985:12).

Havana Complex ceramics--associated with cultural evidence that reflects strong contacts in general with the Havana-Hopewell "interaction-sphere" of Ohio-Illinois and adjacent areas--are

characteristic of the Middle Woodland phase in southern east-central Minnesota (Anfinson 1979:95-102 and 197-202). Although little of the socio-economic and ceremonial complexity that characterizes Havana-Hopewell proper is evident in this part of the Upper Midwest, there are fairly widespread indications of intermittent, possibly seasonal movements of Hopewellian groups or, at least, the exchange of goods and ideas between local Woodland populations and the Hopewellian centers. Finds of Hopewellian artifacts such as Snyder(like) points and platform pipes in northeastern and east-central Minnesota may reflect Hopewellian interest in the native copper sources in this area.

In north central Minnesota, from Mille Lacs to the southern part of the Mississippi Headwaters, there have been numerous finds of grit tempered sherds with a smooth surface and, at times, decoration in the form of bosses, punctates or incised lines. Loosely defined as the Malmo/Kern Series, these ceramics appear to relate to both Laurel and Havana ware; they are also associated with circular mounds and secondary bundle burials as well as lithics similar to those used in Laurel.

Habitation sites of this period are usually located on low ridges overlooking lakes and permanent streams and often in the vicinity of one of several large conical mounds. A number of Middle Woodland sites along the Snake River drainage in southern Pine County seem to represent a southern blend of Laurel and Havana influences. Further north, the Laurel tradition is well-represented by a number of sites, mostly along the main waterways of the Boundary Waters but also along the major tributaries--in 1982, a Laurel house floor was excavated by Superior

National Forest archaeo- logists on the South Kawishiwi River (Peters et al. 1982:104-143).

A.D. 500-
A.D. 800

While the Laurel tradition continued in most of the area discussed in this report, the regions to its south-southwest were affected by a transitional Middle-Late Woodland manifestation characterized by distinctive stamp decorated St. Croix ceramics (George 1979) and an equally distinctive ceremonial use of linear and circular burial mounds and elaborate grave goods (the "Arvilla Burial Complex"--Johnson 1973). Most of the habitation sites of this period are situated in locations that would be ideal for wild rice harvesting (as well as fishing and the hunting of waterfowl)--a fact which, together with the apparent increase in numbers and density of sites (i.e. population size) suggests a growing reliance on wild rice utilization.

More or less contemporary with the St. Croix series is Brainerd Ware, which occasionally is found with St. Croix ceramics in the southern headwaters area but otherwise has a more northwesterly distribution. Usually net-impressed on the exterior, many of the vessels are also decorated with cord-wrapped stick impressions, incisions, linear stamps or punctates. Brainerd Ware has been found on various mound sites (Birk 1979 a) as well as on a number of habitation sites in the Headwaters area.

A.D. 800 -
A.D. 1200/1500

(Late Pre-
historic)

The Late Woodland period is characterized by two traditions which both form parts of a stylistic-cultural continuum--Blackduck ware in the north, Kathio-Clam River ware in east-central Minnesota.

Blackduck seems to have developed out of Laurel, featuring the same geographic distribution and

considerable continuity in artifacts and burials. New features were the distinctive ceramic tradition, the appearance of wild rice utilization in northern Minnesota and a semi-sedentary village life. The ceramics tend to be globular vessels with rounded base and slightly constricted neck and somewhat flaring rim; the lip is usually thickened, the body marked with cord wrapped paddle impressions (or sometimes net/fabric impressions); the decoration, confined to the neck, exterior rim, lip and sometimes interior rim, consists of cord wrapped stick and punctates, applied over a cord wrapped paddle, smoothed, combed or brushed surface (Evans 1961; Lugenbeal 1979). Date: approximately 750-1500 A.D.

The makers of the closely related Kathio-Clam River ware continued the St. Croix subsistence pattern of wild ricing, hunting, gathering and did it with a degree of efficiency that apparently encouraged both further population increase and a semi-sedentary life style--sites are not only more common but also more substantial with several examples of well-developed house floors (Gibbon and Caine 1976). These Late Woodland-Late Prehistoric complexes are also characterized by continued mound construction; the ceramics are often found with small, triangular, either plain or side-notched projectile points. Contemporary with, or somewhat earlier than Kathio, Onamia ceramics may represent a transition between St. Croix and Kathio. They are characterized by a smoothed surface on the rim which most commonly is decorated with widely spaced, loosely wound cord-wrapped stick impressions, sometimes both inside and outside. There are also examples of dentate stamping. The subsistence pattern and other aspects presumably compared closely to that of the other two

traditions. The Mille Lacs area falls within the northeastern part of the distribution range (Ready 1979).

A.D. 1200/1500 - In north central Minnesota, another
A.D. 1750 type of ceramics, Sandy Lake Ware, coexisted with Blackduck Ware but also survived it, continuing in use into early historic times (as evidenced by finds of Sandy Lake ceramics in association with Historic Sioux and early French contact materials from the seventeenth century). It is associated with cultural evidence of the so-called Wanikan culture which appears to have placed heavy emphasis on wild rice processing. Sandy Lake ceramics are quite different from the Blackduck Ware (Lugenbeal 1979) as is the other main type of ceramics in the region of this time--the Ogeechie Ware of central Minnesota (Anfinson 1979:143-148). Ogeechie Ware, along with Sandy Lake, Selkirk and Blackduck, have recently been recovered at a wild rice processing site on Big Rice Lake north of Virginia (Peters, personal communication). Both Ogeechie and Sandy Lake ceramics have been found on permanent palisaded villages inhabited by Historic Santee Sioux Indians during the late 17th and early 18th centuries in the Mille Lacs region of central Minnesota.

17th-18th
centuries
(Initial
Historic
1640 > 1750)

Historic Sioux and Ojibwa

To the north of our area, an apparent westward expansion of Cree and other eastern groups pushed indigenous inhabitants west and south as early as the fifteenth century A.D. and appears to have affected also northern Minnesota (Woolworth 1977:16). Here, Woodland adapted Siouan speaking Dakota Indians, who had dominated Minnesota and western Wisconsin for hundreds of years until the mid-eighteenth and mid-nineteenth centuries, began to be pushed towards the west and south by Algonquin speaking Ojibwa. The latter

were closely allied with the French fur traders and therefore bolstered by a better supply of firearms as well as a rewarding involvement in the fur trade. The lifestyle of the Ojibwa (Chippewa) was characterized by a seasonal subsistence cycle based on the gathering of wild rice and maple sugar, fishing along Lake Superior and the Border Lakes and hunting and trapping in the interior of fur bearing animals (deer was scarce in the coniferous region before logging had increased the stands of deciduous trees and brush land). The coniferous region in prelogging days, did not offer the same abundance of subsistence resources as the mixed conifer-deciduous forests to the west and south. The fur trade had cause rapid depletion of fur bearing animals, particularly beaver, by the late eighteenth century and the Ojibwa population in northeastern Minnesota probably did not exceed a few hundred. These people were mainly concentrated in small villages near Beaver Bay, Grand Marais, Grand Portage, the Boundary Lakes, and some of the larger lakes of the interior, Nett Lake, Pelican Lake and Lake Vermilion (Woolworth 1977:19-20). Between the late 1700's and the 1870's, these Ojibwa were the only people living in the area. With the exception of winter hunting camps (located in sheltered wooded areas) and maple sugar groves, Indian sites seem to have been situated near water, especially at stream and lake junctions, or on islands.

Fur Trade Period French Fur Trade

ca. 1680 - 1760 The efforts of French exploration and fur trade were concentrated mainly on the Boundary Waters region and areas further north, but there is also more intermittent evidence of their presence elsewhere in Minnesota, particularly around the Mississippi Headwaters and the southwestern part of Lake Superior (Birk 1985; Wedel 1974).

1765 - 1868

British and American Fur Trade

This trade was more extensive and competitive and a number of fur trading posts were established around the Boundary Waters and along the northwest shore of Lake Superior (Woolworth 1977:26-29), as well as in interior northeast-north central Minnesota (Johnson 1977:30-31 and 1979:27-31).

Three factors determined the locations of fur trading posts: the fact that the fur traders depended on the same natural resources as the Indians and usually bartered with the Indians for them; their dependence on the Indians for skins and furs; their need to be connected to the network of waterways leading to centers like Fond du Lac and Grand Portage (Woolworth 1977:56). Therefore, the posts were always located by water routes and usually in the vicinity of Indian campsites, on dry and elevated ground on islands or near stream junctions.

1830's - 1890's
(East-central
Minnesota)

Lumbering

1880's - early
1900's
(northeastern -
north central
Minnesota)

By the 1830's, several decades before Minnesota achieved statehood and was officially opened up for homesteading, scouting teams had been sent out by various lumber companies to explore the area between the Mississippi and St. Croix Rivers. Before long, they had set their eyes countless, rich stands of white pine and soon after began logging, at first on an unauthorized basis, which was very much objected to by the Indians, until 1837, when what is now Pine and Chisago counties were included in the first land session west of the St. Croix River, an agreement which made them part of the Wisconsin territory. With this began half a century of intensive logging, first in east central Minnesota along the St. Croix, then the Snake, Kettle and Tamarack Rivers, culminating in the

1880's. Within the next decade, however, the white pines were gone and with them the lumberjacks, but numerous traces remain in the form of dilapidated logging camps, rusting logging hardware in the woods and decaying dams built to regulate water levels and facilitate the rafting of logs downstream to the big sawmills on the St. Croix and Mississippi Rivers. By the late 1800's, the logging boom had moved north--on Superior National Forest, for example, over twenty lumber companies are reported to have been in existence between 1884 and the 1940's (Woolworth 1977:35-44) and an additional 130 have since been documented through archival research and field investigations (Peters, personal communication). The late 1800's and early 1900's also witnessed intensive logging in the Mississippi headwaters region and there are numerous examples of logging related sites throughout the area.

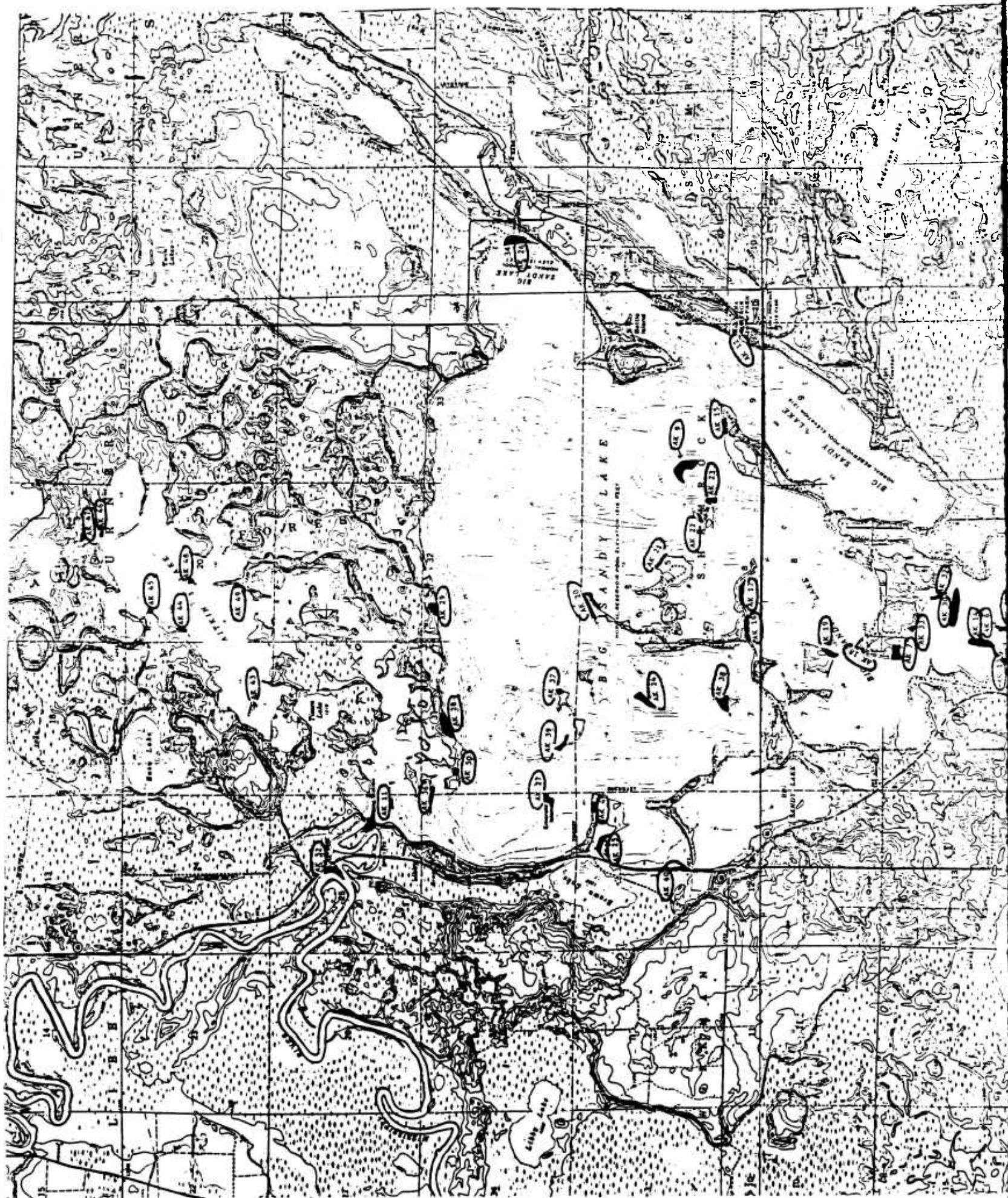
1850's - early
20th century

Immigration and Settlement

Once logging had cleared the land and Minnesota had been declared a territory, settlement began on a large scale. The first land surveys in east central Minnesota took place during the early 1850's. Tote roads, military roads and, in the 1860's, the first railroads opened up the area and villages and towns mushroomed along them--in some cases to survive until the present, in others to last for only a few years as commercial centers shifted to more and more opportune locations along the new railroads.

Cultural Sequence around the Big Sandy Lake Reservoir

Forty-five archaeological sites have so far been recorded adjacent to the reservoir (Figure 6). Twelve of these appear to be multicomponent. Data from the state Site File have been used to tabulate the number and types of cultural components represented (Table 3). Although there is evidence representative of almost the entire



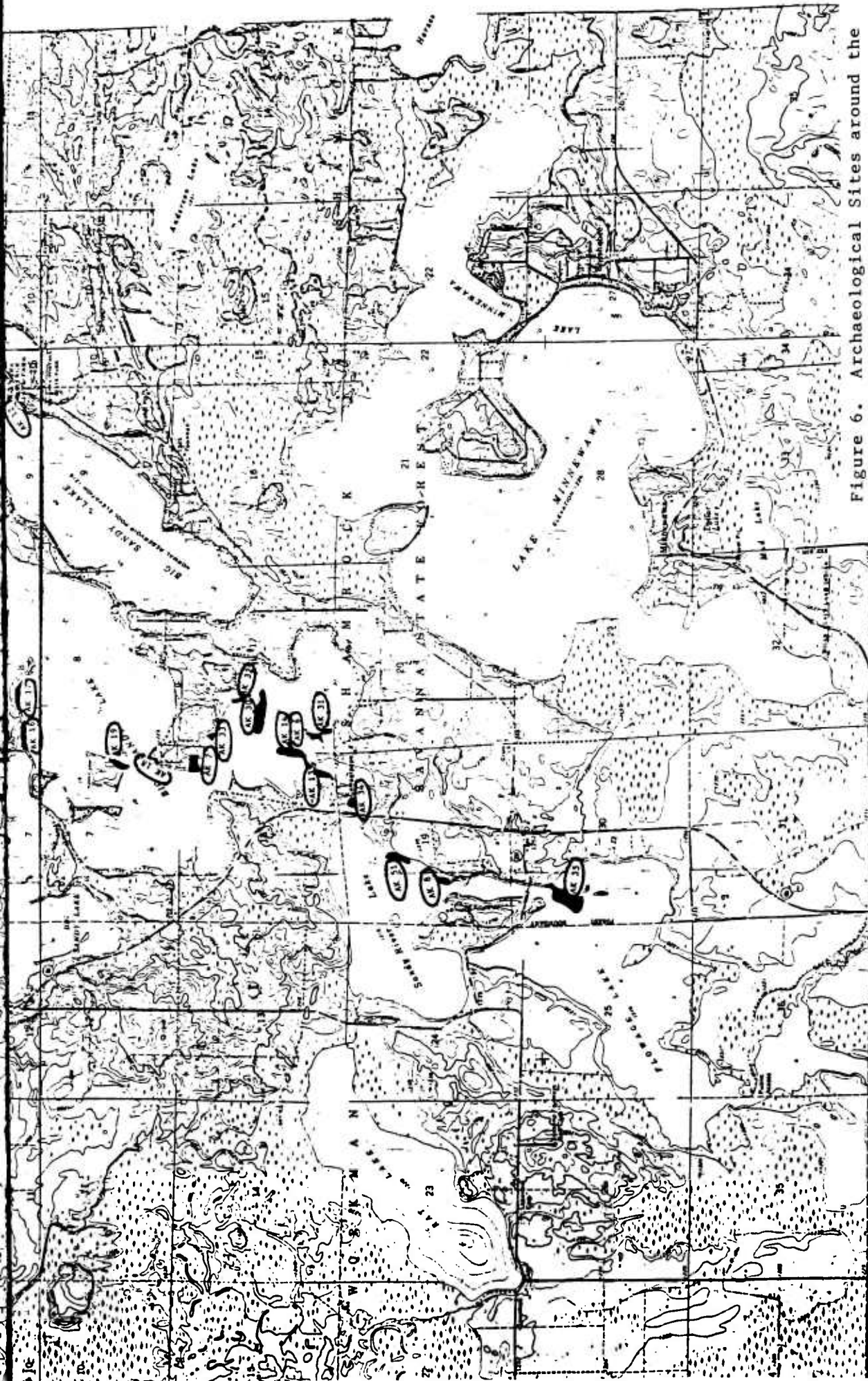


Figure 6. Archaeological Sites around the Big Sandy Lake Reservoir.

		ARCHAIC (gen.)	L. ARCHAIC	MOUND(S)	UNDET. WOODLAND	MALMO/KERN	BRAINERD	ST. CROIX	ONAMIA	APPAR. L. WOODL.	BLACKDUCK	SANDY LAKE	HISTORIC OJIBWA	FUR TRADE	LOGGING	EURO-AMER. SETTLEM.	
AK	4													x			Post
	6			x													Sandy Lk, N.W. Co. Fur
	7			x													5-6 conical mds
	8			x													large single md
	9	?				x					x	x		x			5 con. & lin. mds
	11	x	x			x		?	?		x	x	?	?	?	x	"Battle Island"
	12		x														
	13										?						ricing pits; oval depr.
	14						x										rich habit. evidence
	15											x					lge habit.; ricing
	16	x						x			x	x					habit. poss. burial
	17											x					habitation
	18								x			?					" , poss. burial
	19									x							habitation, ricing
	20											?					"
	21																lithics only
	22											?					find spot
	23				x												habitation
	24						x										"
	25						x										"
	26									x							small triang. pts, sherds
	27				x												small side-notched pt
	28			?													32 poss. mds in low area
	29			x						x			x				numerous ricing pits
	30		?								x	x					
	31				x												habitation
	32										x	x					
	33				x												
	34			x													3 conical, 1 composite
	35			x				?									linear md; ricing
	36										x	x					informant report
	37										?						habitation
	38	x								x							" ; ricing
	39											x		?			habit.?.; poss. trade ?
	40			x						x							mds; ricing pits
	43												x				ricing; habitation
	44										?						habitation
	45						?					x					"
	46									x							"
	47												x				foundation
	48											x					
	49												x				ricing, habit.
	50										x						
	51									x							
	52													x			Aitkins Amer. Fur Post
		3	2	7	4	2	3	1	1	7	7	11	4	3		1	(definite)
		(1)	(1)	(1)			(1)	(2)	(1)		(3)	(3)	(1)	(2)	(1)		(possible)

Table 3. Cultural Components Identified on Big Sandy Lake Sites.

prehistoric and early historic sequence (with the exception of the earliest paleo-Indian period), there seems to be a clear predominance of Late Prehistoric occupation levels. A number of these, as well as some early historic Ojibwa sites, yielded evidence of wide rice processing--ricing pits and types of ceramics generally associated with a wild rice using subsistence pattern.

Only five, possibly six, sites date (all or in part) from the Archaic, including 21 AK 11, which also seems to contain some Late Paleo Indian evidence. Finds of copper artifacts have also been reported but are not yet field verified from other locations--generally from what are described as deeply buried deposits (Gibbon and Leistner 1983). Consequently, there may well be a number of additional, as yet unrecorded Old Copper sites that have escaped discovery through shovel-testing or other forms of recent disturbance. There may also be another explanation for the relatively low number of sites with Archaic components along these shores. Recent investigations in the Headwaters region have located a number of pre-ceramic sites at some distance inland from present shorelines, on ancient beach ridges formed during periods of higher lake levels (see page 11). As survey coverage around Big Sandy generally has been limited to the shore, a number of these earlier sites may well have gone undetected.

Several historic Ojibwa villages and burial grounds are known to have existed along the shores of the lake (see above, page 5, as well as Figure 7). There are also the remains of two, possibly three, fur trade posts, as well as the common presence of early historic trade goods on other archaeological sites. All this points to a significant amount of interaction between the Ojibwa and French, British and American traders--not surprising, considering the crucial role of Big Sandy Lake and Sandy River as a link between the Mississippi River and the Great Lakes watersheds. Between the headwaters of the East Savanna River (a tributary to the St. Louis River-Lake Superior waterway) and those of the West Savanna River (which empties into the Prairie River-Big Sandy Lake-Sandy River-Mississippi River drainage), there is a low continental divide (Figure 7). Across this divide ran a muddy, mosquito infested, 6 mile long trail which was known as a major route of travel during the early historic period and presumably also for much of the prehistoric period (Waters 1977:28; Minnesota State Site File for Aitkin County). The portage has been described in a number of journals kept by traders, explorers,

missionaries and other travellers between the two river drainages. Presumably, these travellers also passed by the outlet of the Big Sandy en route to or from the portage, a fact which is of particular significance to the interpretation of 21 AK 11.

The importance of the Mississippi River-Big Sandy Lake route continued through the 19th and early 20th century, as steamboat traffic flourished along the 125 mile stretch of the Mississippi between Aitkin and Grand Rapids (Waters 1977:236). When the dam was constructed across the Sandy River in 1895, an operating lock was installed in order to allow steamboats to cross the Big Sandy and even ascend the Prairie River as far as to its junction with the West Savanna River. The steamboats catered mainly to the lumber industry but they also accommodated the freight and passenger needs of farmers and other settlers.

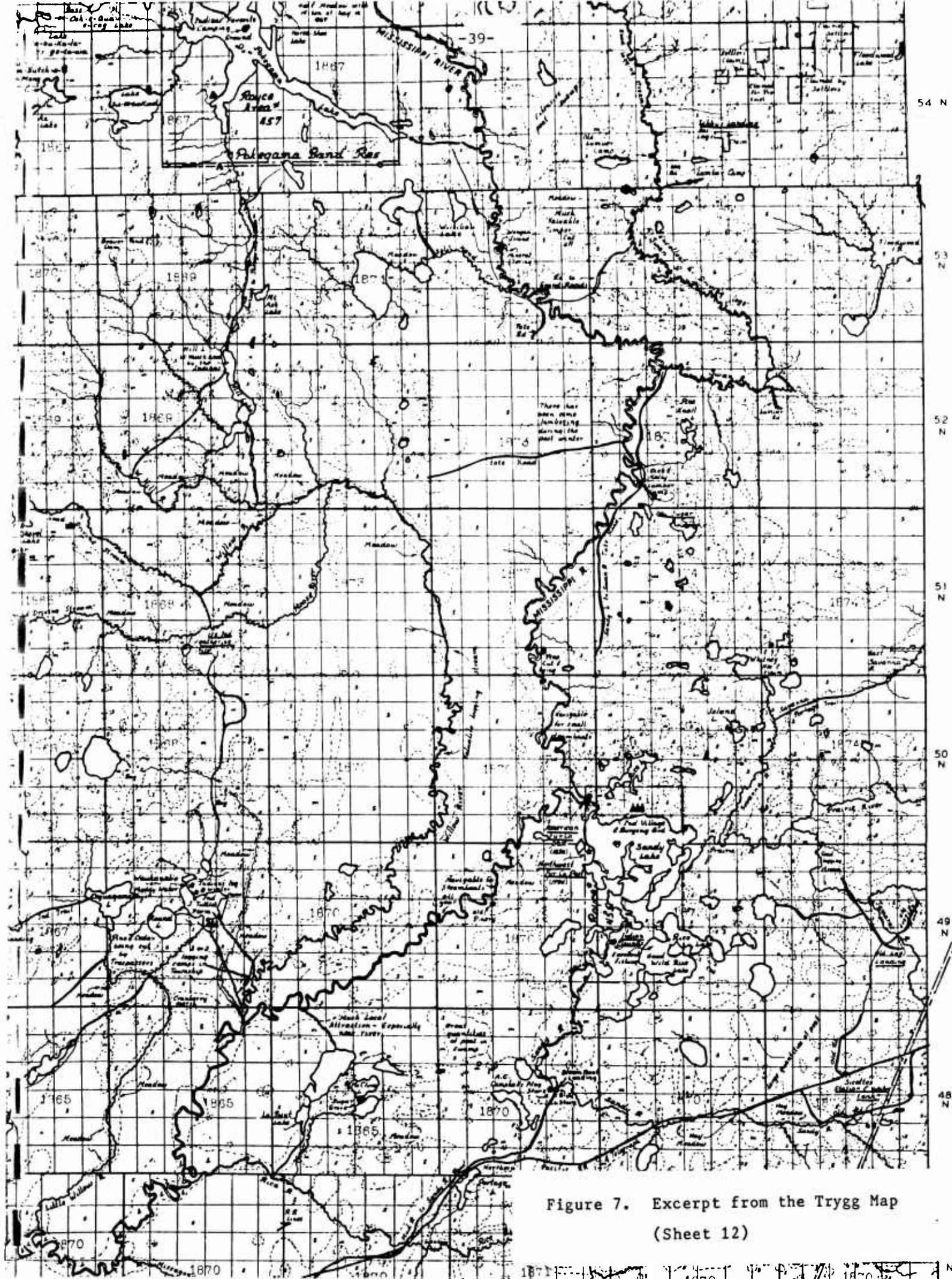
Figure 7, a copy of the Trygg map (Sheet 12), shows the location of several historic Ojibwa settlements, trading posts, trails and portages as well as some site associated with early Euro-American settlement and logging industry.

As seen in Table 3, 21 AK 11 appears to contain more cultural components than any of the other sites around the reservoir. Along with prehistoric evidence spanning as much as eight millennia, the site has also yielded an abundance of historic evidence, mostly from the late 19th and early 20th centuries, when this was the town of Libby. The cultural evidence from the site and its immediate vicinity will be discussed in more detail below in Sections V and VI.

IV. RESEARCH APPROACH; FIELD METHODS; RESULTS OF FIELD INVESTIGATION

Research Approach and Field Methods

While informant reports and the results of earlier investigations indicated the presence of prehistoric and early historic evidence across most of the Sandy Lake Recreation Area, it was not at all clear to what degree these archaeological deposits had been impacted by late 19th and early 20th century settlement or by later undertakings by the COE. Nor was there sufficient information to indicate, with any certainty, either the full range of cultural components present or their perimeters.



A combination of archival research, soil coring and shovel-testing was used to reconstruct the nature and extent of disturbance from historic land use. As a first step, a composite map was prepared from a series of COE maps and project plans prepared in 1920, 1936, 1951, 1962, 1964, 1973 and 1985 (map numbers are listed in Section VII). The final version of this composite map has been included in this report as Figure 8 (foldout map in back pocket); reduced excerpts are found in the main text as Figures 10, 13 and 16. It shows the present layout of the COE property as well as a) the locations of a number of demolished structures formerly associated with the town site of Libby and the early days of Federal ownership, and b) the location of subsurface features such as sewer and water lines. In addition, the map shows several areas where past borrowing or depositing of fill has been significant enough to be indicated on project plans (such areas have been indicated by their actual perimeters which often vary considerably from those proposed on the project maps).

The draft version of the composite map was used both as a guideline for the field investigations and as a basemap for the plotting of the results. Two aspects of the field research--the soil investigation and the shovel testing--then served to verify/modify the archival information and also to identify other soil anomalies that results either from late 19th-early 20th century activities in Libby or from small scale, unscheduled and unrecorded projects undertaken by the COE.

The soil investigation was performed by Grant Goltz, Consulting Soil Scientist. His field methods consisted of: a) systematic soil coring along transects, b) observation of existing land forms, and c) examination of the soil profiles in the archaeological test units (Appendix C). His observations and conclusions have been translated into maps that also show the location of cores and transects (Figures 12, 15 and 26). In addition, all the information about the extent and nature of past disturbances have been added to the large, composite map (Figures 8, 10, 13 and 16).

Shovel-testing was performed along transects which were extended in the following manner:

- in the case of fairly narrow topographic features such as ridge crests less than 30-40 m in width, along the center of the crest rather than as a straight line;

- on wider, more level uplands, in parallel lines spaced at 10-15 m intervals.

The locations of all tests are shown on Figures 8, 10, 13 and 16; all the pertinent information regarding compass bearings and measured distances have been listed in Appendix E.

Shovel-tests measured 45-50 cm in diameter, and were taken out by 10 cm levels. The soil was screened through 1/4 inch hardware cloth. Soil profiles were inspected by Grant Goltz and recorded on standardized test forms (Appendix B).

In order to obtain better stratigraphic and horizontal control and, possibly, reveal larger and more distinct segments of buried features, six larger, formal test units were then excavated adjacent to the most interesting of the shovel-tests. While levels still were designated by 10 cm increments, efforts were made to piece plot as much of the evidence as possible (except where obvious disturbance by past plowing or construction seemed to render such efforts rather pointless). All positive levels were troweled, soil samples representing approximately 5% of each level were brought back to the laboratory to be screened through 1.8 mm mesh. The bottom of each level, as well as at least one of the wall profiles, were mapped or drawn and then photographed in black and white--units with distinctive and non-random soil discolorations were also photographed in color.

Results of Field Investigation

All the 1985 test units were numbered in sequence, shovel-tests as ST1-62, formal tests as FT1-6. For ease of reference during site description, however, the investigated area was divided into four subareas (Figure 9).

Area A: all government property on the N/NE side of Sandy River;

Area B: the peninsula that extends along the S side of the river upstream from the dam;

Area C: all of the government property located S/SW of the river and W of the access road;

Area D: the terrace E of the access road and S/SW of

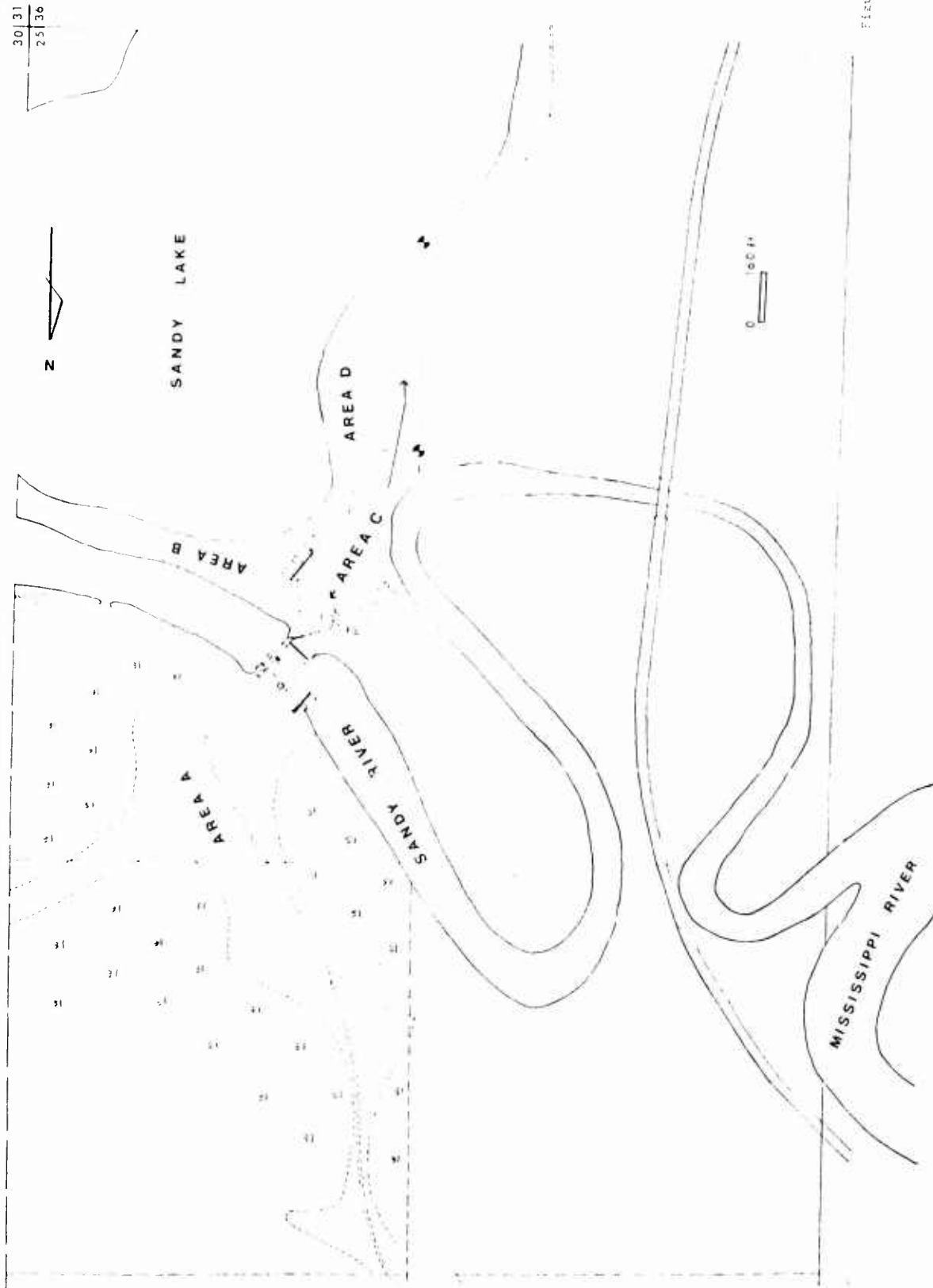


Figure 6. Schematic map indicating Sub Areas A-D.

Area B.

These subdivisions were based in part of topographic considerations, in part on apparent cultural differentiation (Areas C and D).

The rest of this section will give a brief description of each subarea, with emphasis on the test results and those of the soil investigation. A more detailed description of the cultural material will be given below in Section V. For a summaric treatment of the evidence found in each area, see Table 4-6.

Area A (Figures 8, 10, 11 and 12; Tables 4 & 5).

Presently developed as a campground, this distinctive glacial ridge was formerly the location of several buildings (residences?) and one school house (Figure 4). In 1951, during the construction of the new access road, parts of the gravel deposit were removed and used as fill.

Two of the three tests put in by the Science Museum of Minnesota team in 1977 proved completely negative, while the third, placed near the old schoolhouse foundation, produced some historic items probably connected with the use of the school.

In 1985, 24 shovel-tests were placed along the northeastern, still fairly undisturbed part of the main crest as well as along the crests of two northeast trending lobes of the same. (Test records are included as Appendix B; a list of all the excavated evidence can be found in Appendix D, while a summary of the same information has been presented as Table 4). Testing was preceded by complete visual inspection of all areas when subsoil had been exposed by landscaping or the extraction of gravel.

On the northern one of these lobes, 8 out of the 12 tests (ST21-32) proved positive though not very prolific. In addition to some historic material (not very old), found mostly near the base of the lobe, i.e. near the main crest, there seems to be a very thin scatter of lithics all along the crest--mostly flakes but also one hammerstone and a few grindstone fragments. There was no evidence of any features.

Of the 6 tests put in along the main crest (ST33-38), the first three produced a fairly dense scatter of evidence (some body sherds, part of a scraper, some debitage, a grindstone fragment as well as some fire-cracked rock fragments). The

sherds, though not very diagnostic, seem to indicate a Late Woodland affiliation. ST36-38 were negative, but some debitage collected on a disturbed part of the crest somewhat further S/SE suggests that at least a sparse scatter of cultural evidence covers most of the preserved portion of the main ridge.

ST39-44 were placed along the southern, larger one of the two lobes--a narrow ridge with marsh (former lake) on both sides. All but one produced a thin scatter of lithics. ST41, on the wider SW part of the lobe, as well as adjacent FT1, yielded a fairly dense concentration--a nicely parallel flaked biface with a twist (a drill?), a decorated Middle Woodland sherd (probably Malmo/Kern related), debitage, a grindstone fragment and quite a bit of FCR. All the cultural evidence was found above a sterile, apparently natural bed of cobbles and boulders. There were no features. The soil profile, however, indicated that most of the cultural deposit is fairly undisturbed, even though the uppermost 10-15 cm consist of fill. The potential for finding features seems very high.

As shown on Table 5, most of the prehistoric evidence is located between 20 cm and 50 cm below the surface. Soil profiles indicate that the levels have suffered little or no disturbance. Wherever prehistoric materials were encountered higher up, it was in a clearly disturbed context. Only in one instance was a questionable artifact found further down, and then just below the 50 cm level. The historic evidence, on the other hand, seems confined to the uppermost 20-30 cm, in what appears to be late 19th-early 20th century trash dumps. Other than the foundation of the old school, there are no structural remains of the occupation that preceded the campground.

As indicated on Figure 10, untested areas were excluded from the investigation for one of two reasons--either they featured a very distinct gradient, or they had been too deeply disturbed by the borrowing of fill.

The results of the soil investigation indicated that the 1951 borrow area was limited to the NW part of the main ridge (Figures 10 and 12). Soil cores and test profiles all suggest that the rest of the more level area has suffered rather minor disturbances--mostly the result of rather superficial landscaping during the preparation of tent pads and access spurs. In short, most of the tested uplands appear to contain fairly undisturbed cultural evidence with considerable research potential.

GOVERNMENT PROPERTY LINE

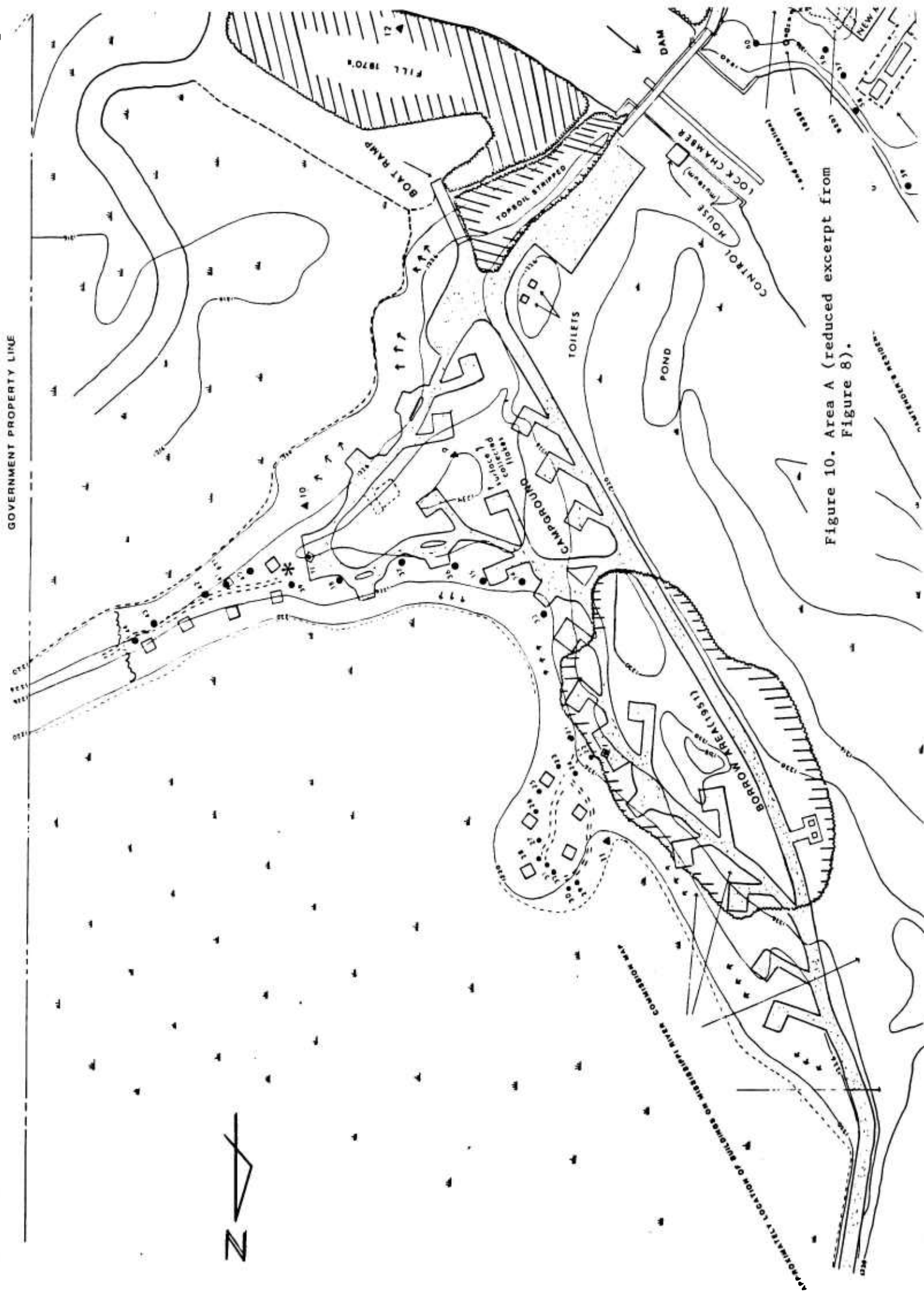


Figure 10. Area A (reduced excerpt from Figure 8).

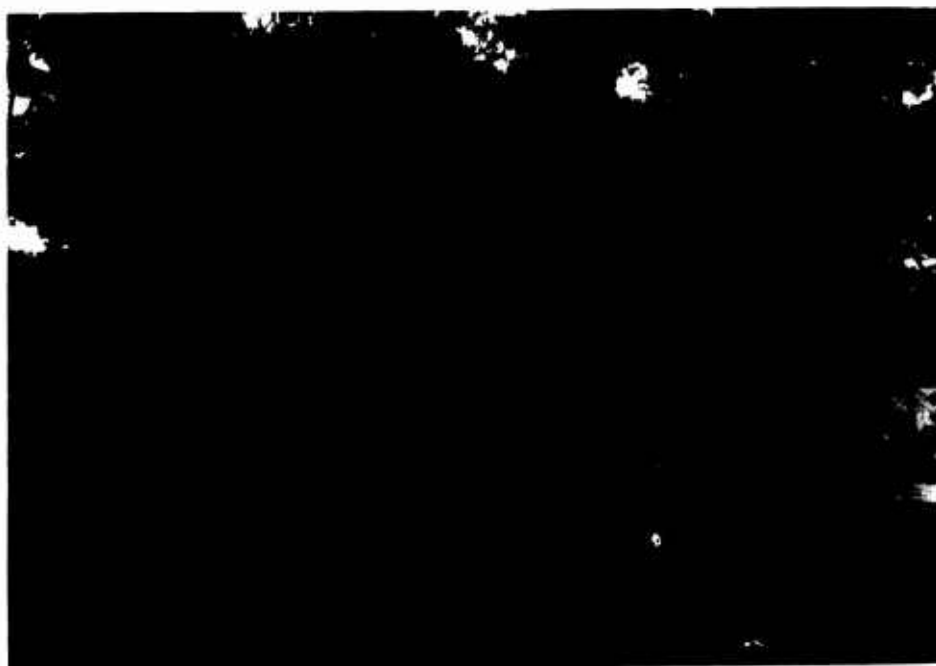


Figure 11. View north across the N/NE lobe of Area A (above);
view NE across the SE lobe of same (below).

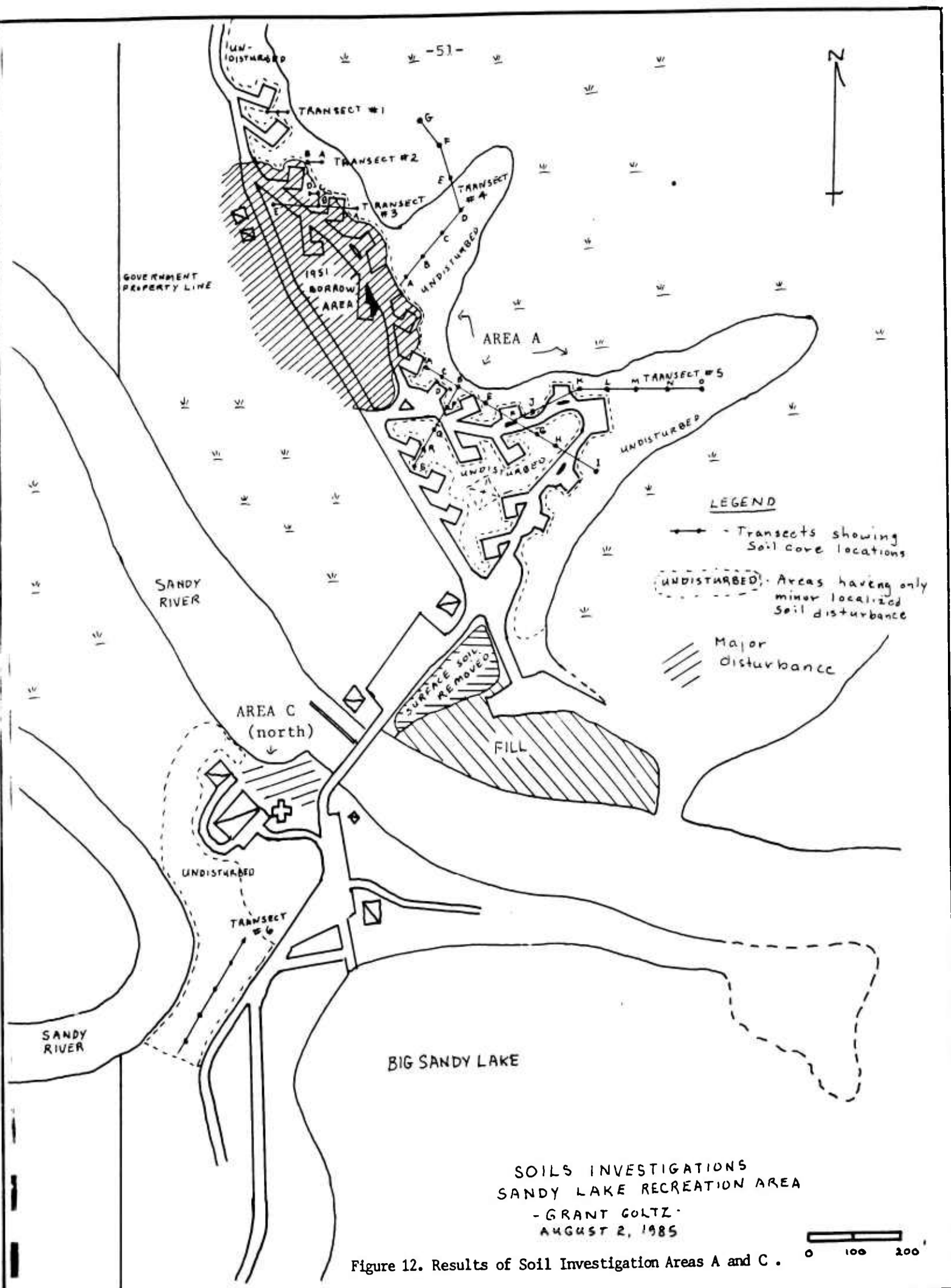


Figure 12. Results of Soil Investigation Areas A and C .

		Rim/Neck Sherd	Body Sherd	Projectile Point	Scraper	Lge Biface	Med.-Small Biface	Flake w. Retouch/Use Wear	Retouch/Rejuvenation Flake	Tertiary Flake	Decortication Flake	Shatter	Core/Checked Piece	Abrader/Polisher	Grindstone	Hammerstone	Copper	Gunflint	PCR	Faunal	Charred Seed	Charcoal	Historic Metal	Historic China	Historic Glass	Historic - Miscellaneous
AREA A	ST 21								1											x*	x*	x		x	x	
	ST 22																			x*		x	x	x		
	ST 23								1															x		
	ST 24																			x*		x	x	x		
	ST 25								1																	
	ST 26																						x			
	ST 28								2						2											
	ST 31									2				?												
	ST 33	1							1	1	2															
	ST 34	1	1						6	1	1		1					x		x						
	ST 35								3	2	1			1												
	ST 39								1		1															
	ST 40								1		3															
	ST 41	1							2	1	2							x								
	FT 1					1			10	4	1							x						x		
	ST 42								1					?				?								
	ST 44								1						?			?								
		1	2	1	1				29	6	17	1	1	1	2			x		x**	x*	x	x	x	x	

(3)(3)

AREA B	UoM#1	3	1		1	20																			
	UoM#2	1	2			21														x		x		x	
	UoM#3					10																	x	x	
	UoM#4					8														x		x		x	
	UoM#5	11	2	8	1	68																			
	SMM#6		1			12														x*		x	x	x	
	SMM#7																								
	SMM#8																								
	SMM#13					1																			
		15	3	11	1	140														x		x	x	x	

* historic ** historic in all but ST 34

Table 4. Summary of Cultural Evidence Found in Area A (1985) and in Area B (1975 and 1977).

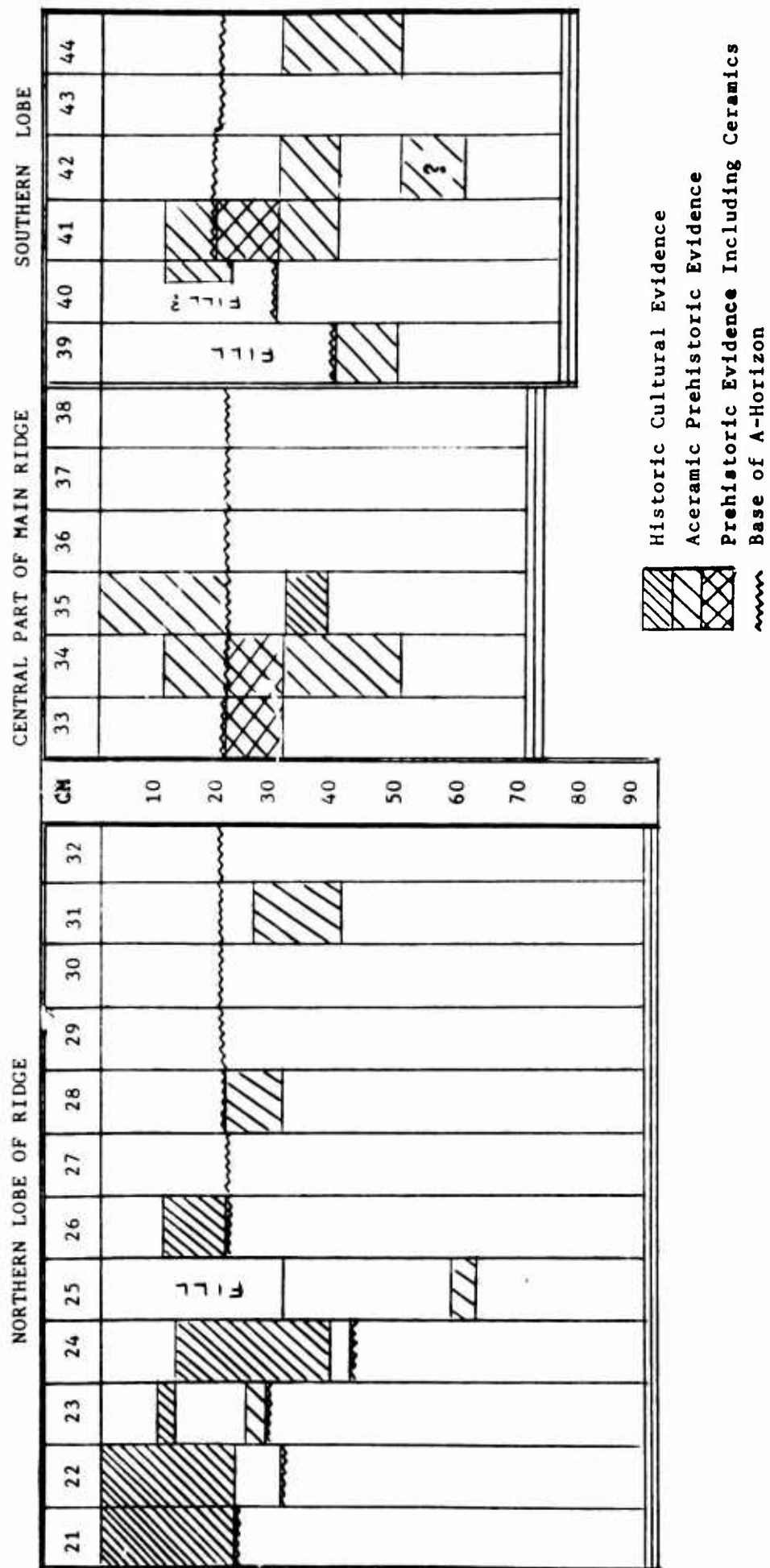


Table 5. Area A Test Units -- Depth of Historic and Prehistoric Cultural Evidence.

The rest of Area A consists of either low, rather marshy ground or, near the dam, of somewhat higher but very disturbed ground without any cultural potential. The low and level peninsula S/SW of the boat channel was tested by the Science Museum team with negative results. 1985 soil coring indicated that it consists almost completely of fill; comparison with early maps also suggested that much of it was built up in connection with the redesigning of the boat channel.

Area B (Figures 8, 13, 14 and 15; Table 4).

This area encompasses another rather narrow ridge, the higher part of which extends for some 200 m east-west between Sandy River and the lake. Most of it has been developed as a campground. While the eastern half, which is reserved for tent camping, has been left in a fairly natural state, the western half has been subjected to quite extensive construction and landscaping. Earlier maps indicate that a row of buildings--a carpenter's and a blacksmith's shop, a warehouse--were erected across the base of the peninsula during the late 1800's (Figure 13). They were later demolished and their foundations covered with the fill and blacktop used to widen the access road. Later, the facilities for the central water supply were constructed/buried just E/NE of where the old buildings once stood--a pumphouse, wells and buried water pipes. In 1975, a comfort station was erected in the southern part of the area, just E/NE and up the slope from the boat ramp and boat access that were constructed in 1963. At about that time, the crest of the western half of the ridge was covered with fill in order to create the level terrace that now provides trailer camping.

Area B was tested by the University of Minnesota in 1975 (5 formal test units) and by the Science Museum of Minnesota (SMM) in 1977 (4 formal and informal units). U of M (tests) #1 and 2, both near the wells and the comfort station, yielded dense concentrations of late Woodland body sherds, percussion flaked lithics, debitage and some bone. While the top 20-30 cm consisted of fill, the lower levels appeared to be fairly undisturbed. U of M #3, towards the eastern end of the landscaped area, showed less disturbance but also yielded less material--all debitage. U of M #4 was excavated into the edge of one of two shallow depressions, possibly the sunken floor of some late prehistoric or early historic dwelling (Johnson 1975). The top 15 cm yielded a dense mixture of prehistoric lithic debitage and late 19th-early 20th century debris; below this was a sterile, thick layer of

cobbles. U of M #5, finally, was placed near the eastern end of the crest. It yielded prehistoric material to a depth of 35 cm, all without any sign of disturbance, and was the most productive of the tests--13 flakes artifacts, 68 pieces of debitage, 11 cord-marked Late Woodland sherds and some mammal bone. Oddly enough, SMM #7, 8 and 13 had all been placed in this area just a few meters east and west of U of M #5 with almost completely negative results--all that was found was a flake in #13. SMM #6, on the other hand, close to U of M #4, yielded an even greater abundance of historic items as well as some prehistoric lithics, in all some 225 items. This spot appears to represent a historic trash pit dug into a fairly late prehistoric deposit.

Considering the 1975 and 1977 results, as well as those of the 1985 soil cores (Figure 15), it seemed proven beyond any doubt that the major part of the ridge still retains fairly undisturbed and densely concentrated deposits, with or without a cap of fill. The only area that appears to have suffered major disturbances is the westernmost part, near the access road and even there, chances seem good that deeper levels may have survived with minor loss of data. In short, most of Area B must be considered to have good to excellent research potential.

Because of an earlier proposal (since rejected) to move the existing boat ramp below the comfort station and to replace it with a swimming beach, the initial 1985 investigation was extended also to that area (Figure 14). Soil coring around the ramp indicated that this area has suffered major disturbances and that much of the more level ground consists of hard packed fill. The remainder of that area features mostly rather distinct slope. Shovel-testing did not seem warranted.

Area C (N half) (Figures 8, 12, 16, 17 and 18; Tables 6 & 7).

In the late 1800s, this area constituted the original town of Libby; since the dam was built in 1895, it has housed the dam tenders residence and office as well as various maintenance buildings. As a result, most of the central part has been badly disturbed by years of intensive use and many alterations. The residence, originally the Libby P.O. (Figure 4), has only suffered minor changes in orientation and extent; other buildings from that early period (the woodshed, ice house, chicken coop etc. shown on Figure 8 and 16) have since been torn down, as has the earliest office building. Most recently, in the mid-1970s, the area was drastically

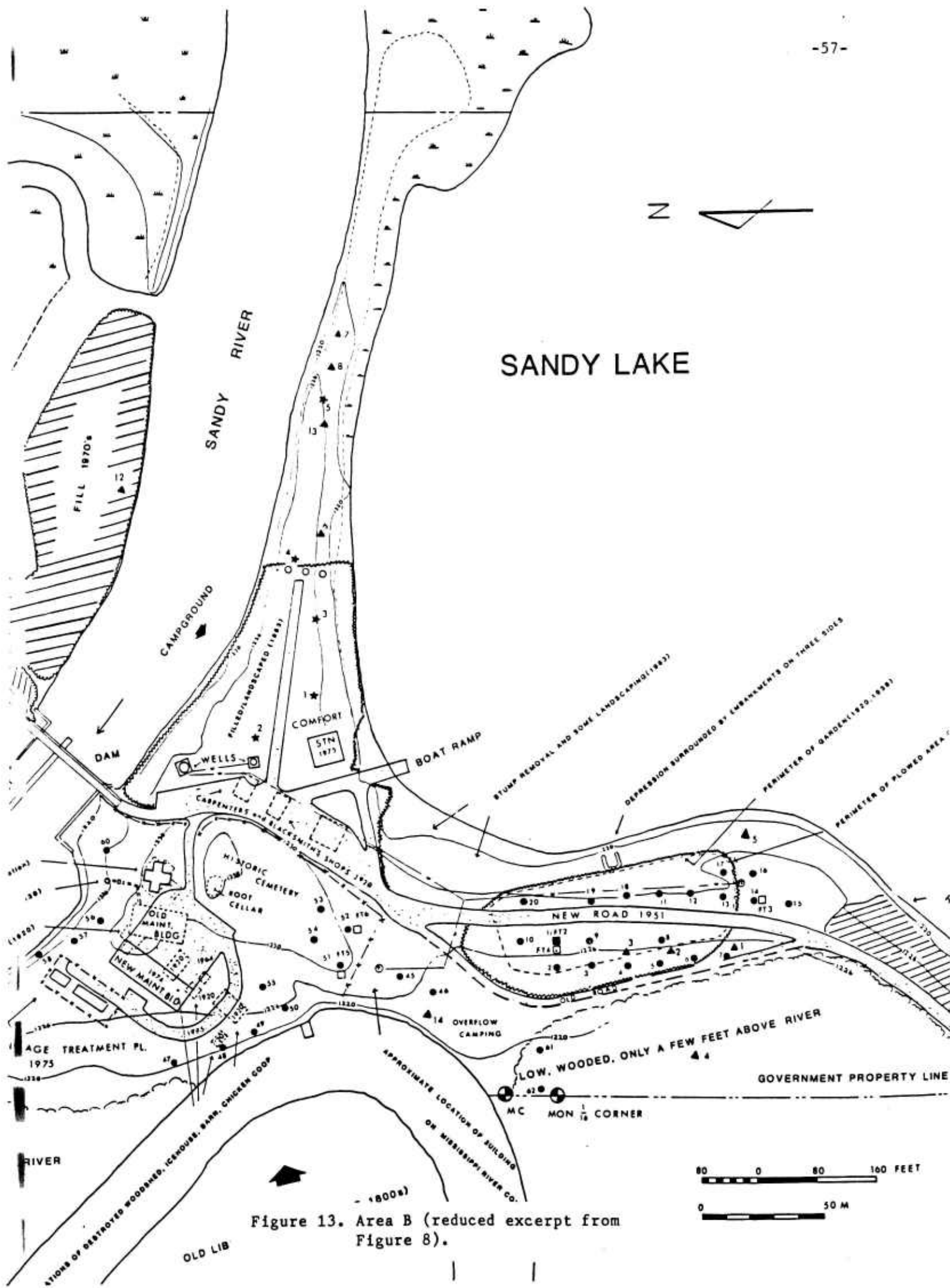




Figure 14. Boat ramp as seen from the SW (above) and the NE (center); view from boat ramp E along S part of Area B (below).

N

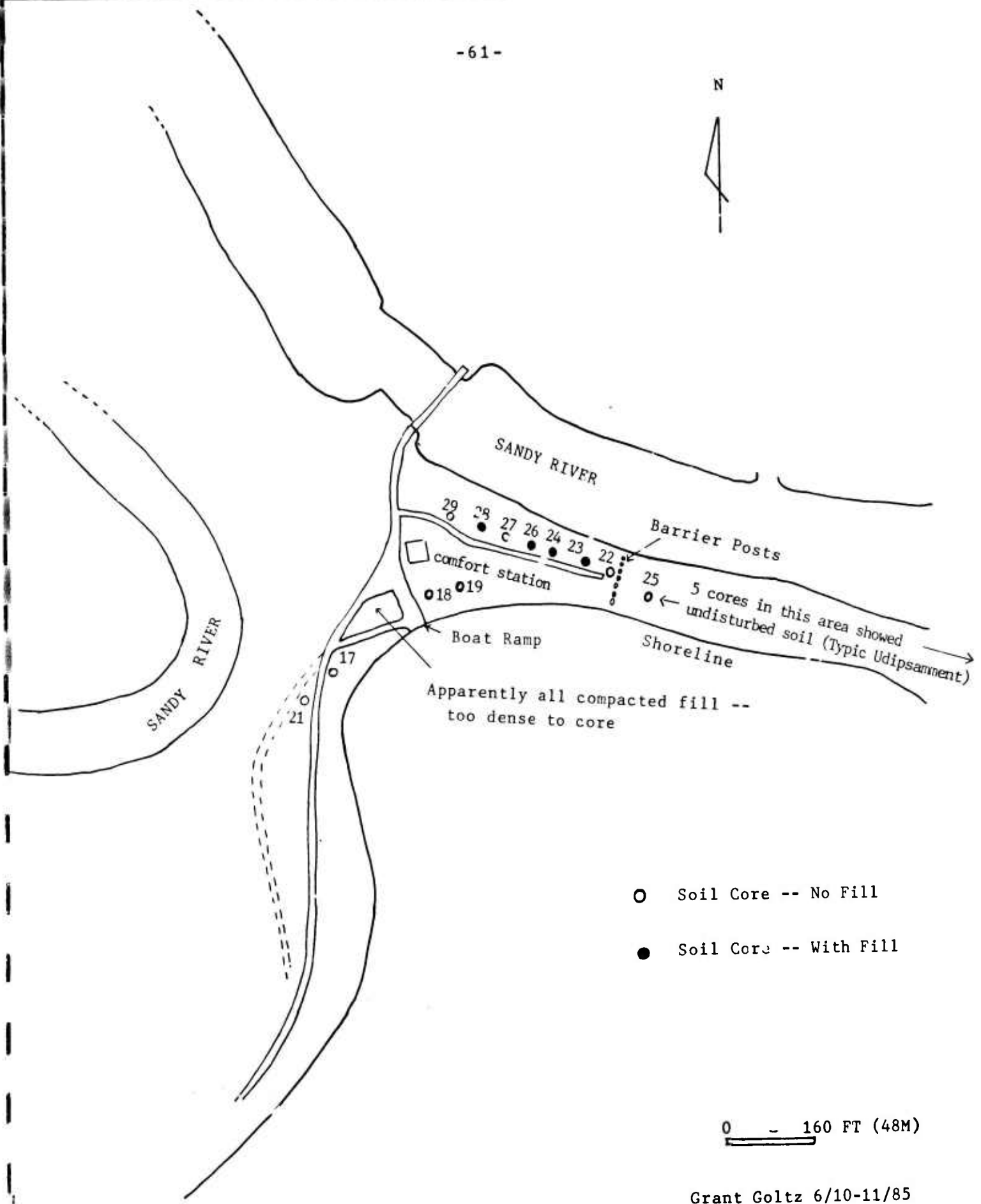
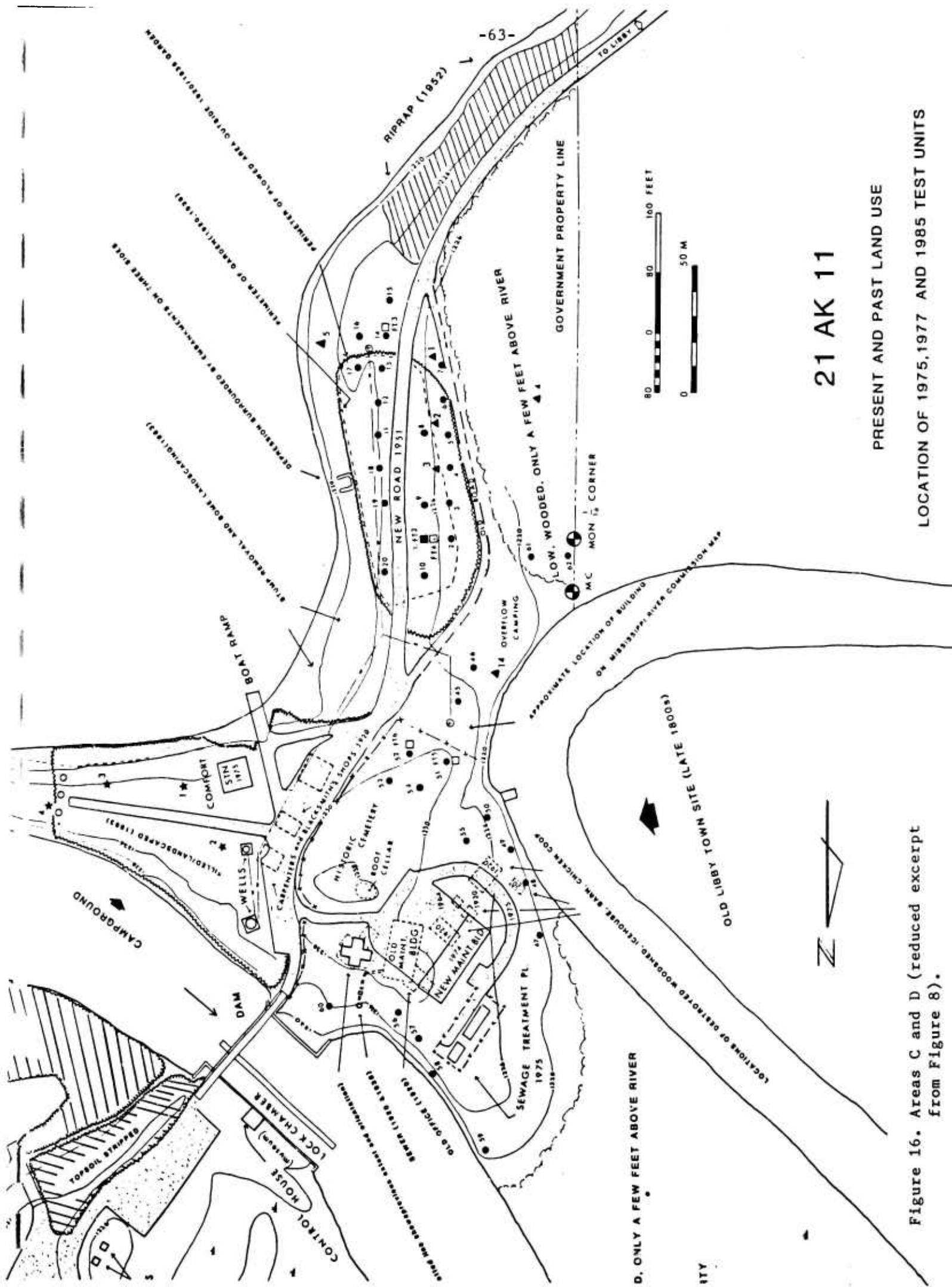


Figure 15. Results of Soil Investigation in Area B.



21 AK 11

PRESENT AND PAST LAND USE

LOCATION OF 1975, 1977 AND 1985 TEST UNITS



Figure 17. Area C, Views W/NW across ST51/FT5 and ST52/FT6 (above) and ST51/FT5 with Sandy River in the background (below).

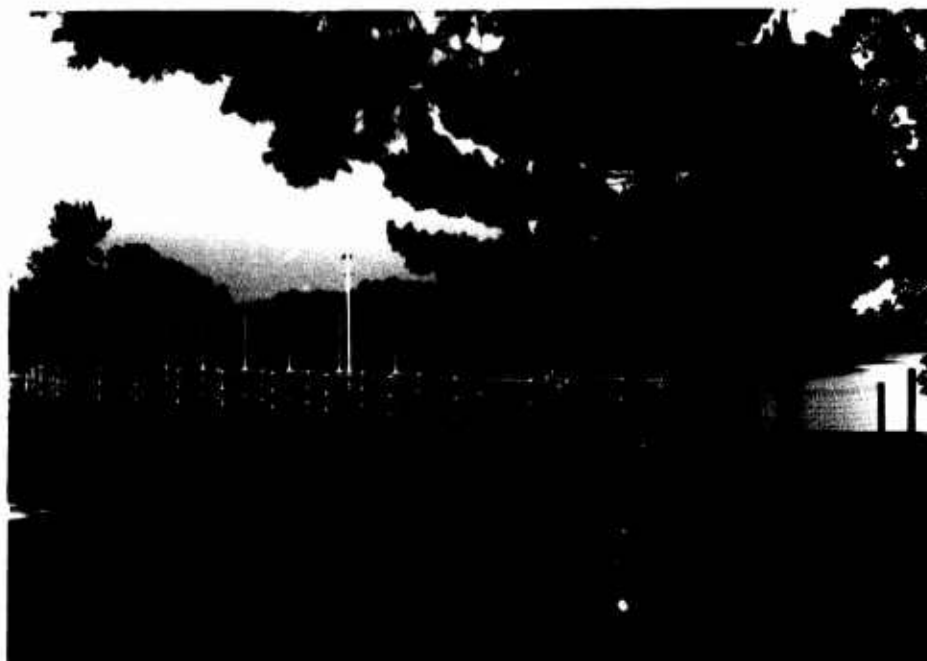
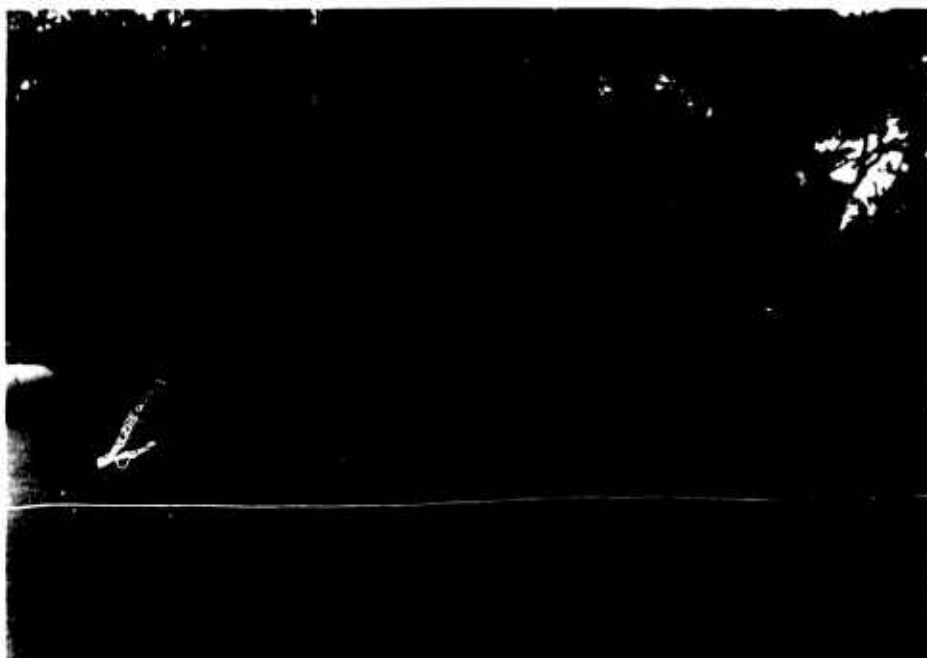


Figure 18. View W across ST56 and ST57 (above); view NE across ST60 and dam (below).

affected by the construction of a new maintenance building, a sewage treatment plant and a curving, raised access road to the latter. In his 1975 report, Eldon Johnson mentioned finds of prehistoric ceramics and lithics in the backfill piles that surrounded the construction areas. Project plans for 1920 and 1936 also indicate that a septic tank-sewer system was buried on the gradual slope N/NE of the residence. Drastic alterations are also evident in the NE part of Area C, downstream from the dam, where extensive recontouring of the river bank appears to have totally obscured the original topography.

With the exception of areas that were too low and wet, too sloping or too deeply disturbed to retain any cultural potential, all of the north half of Area C was tested at 15 m intervals (avoiding the historic cemetery shown on Figure 16). ST45-50 and 55 were all placed along a lower terrace that overlooks the Sandy River to the W/SW; they yielded a rather thin scatter of debitage, some FCR, some fairly recent debris near the location of the old chicken coop, as well as one diagnostic late Woodland projectile point. On the whole, they produced considerably less than had been expected of such a location and the evidence seems relatively recent. This fact makes more sense when it is viewed from a geological perspective, i.e. when one considers the very meandered course of the Sandy River. Presumably, the sharply bent meander that now flows past the picnic/overflow camping area is a rather recent feature, in the same manner that the low peninsula NW of the office complex is a fairly new creation--a series of concentric ridges that extend from the base of the peninsula towards its tip are a clear reflection of that process. It seems unlikely that the course of the river came this far east before late prehistoric or even historic times. As it did, it must have eroded away any deposits that would have contained evidence of earlier river oriented camps and activity areas.

ST51-54 and FT 5 and 6, all located on the southwestern tip of the ridge that houses the root-cellar and cemetery (Figure 16), produced enough evidence to indicate the presence of a repeatedly and intensively used area. Together, they yielded rim sherds representing at least a dozen vessels and several different ceramic traditions ranging from what looks like St. Croix and Onamia Ware to distinct Blackduck and possibly also Sandy Lake. There was an even larger number of Late Woodland body sherds, several small, triangular projectile points, several other finished lithic tools, much debitage, grindstone

fragments, a large amount of firecracked rock, burnt and unburnt bone--all from a few shovel-tests and two 50 by 50 cm large formal units. While the bulk of the evidence appears to be late prehistoric, there was, for example, in FT5, a lozenge-shaped object of hammered copper that could be one half of a broken fish gorge, Wittry's Type VII:B, which would date it to the Late Archaic. In the same unit, near the copper and the late prehistoric sherds, there was also a British gunflint. This kind of close proximity suggests considerable disturbance within what clearly is a multicomponent deposit; however, as indicated by soil profiles and depth of findings (Table 7), the disturbance is rather patchy and erratic (as may be expected in an area that has seen many small scale excavation projects over the years, from the digging of a new fire or trash pit in prehistoric times to the planting of the COE flagpoles that now stand on the ridge). It seems highly likely that this part of the site has retained a considerable amount of integrity.

Further north and northwest of the same ridge, the impact of 20th century developments has been much more destructive, particularly in the areas underneath and around the sewer treatment plant, the new maintenance building, the realigned access to both and the heavily landscaped yard in front of the maintenance/office building and the damkeeper's residence. Reviews of the 1975 University of Minnesota report, of various construction plans on file at the Corps of Engineers St. Paul Office and of comments made by Corps staff at the Recreation Area, all indicate the extensive impact caused by the construction of these facilities. It seems highly unlikely that much, if any, of the cultural deposit survived these undertakings.

On the north side of this heavily developed area, ST56-60 were placed on the level to gradually northward sloping northern end of Area C. The yield was meager, just a few lithics, and there was intermittent evidence of past disturbance--filled areas, buried cables and water lines, etc. One of the finds (ST56) is a broken, very weathered bifacially flaked ovate of siltstone, very similar to some of the bifaces in the Reservoir Lakes assemblage near Duluth. This find, along with the lack of ceramic evidence and the reported finds of Archaic copper items along the river below, all suggest the presence of one or more early components in this part of Area C. Again, soil profiles and depths of findings suggest that recent disturbance has been erratic; it seems highly likely that sizable segments of undisturbed cultural deposit remains in between.

	Blind/Back Sherd	Body Sherd	Projectile Point	Scraper	Large Biface	Medium-small Biface	Flake w. Retouch/Use Wear	Retouch/Rejuvenation Flake	Tertiary Flake	Decortication Flake	Slatter	Core/Cheeked Piece	Abrader/Polisher	Grindstone	Hammerstone	Copper	Gunflint	Flint	Faunal	Charred Seed	Charcoal	Historic Metal	Historic China	Historic Glass	Historic - Miscellaneous
ST 1	1	5						2	5									x	x					x	
ST 2 & Ext.	3	1			1		4	4									x		x	x	x	x		x	
ST 3									2	1															
ST 4	1							3	1	1									x		x	x			
ST 5								1									x				x	x			
ST 6								1	1																
ST 7								2	1	5							x				x	x			
ST 8	2							4				1					x		x		x				
ST 9	8							1									x				x	x			
ST 10	9							3	4	1		1	1				x		x		x			x	
FT 2	3	20	1			1	10	9									x		x	x	x	x			
FT 4	10						2	10	1	6	1		1				x		x		x	x	x		
Sub-Tot.:	6	5	1	1		2	2	4	3	3	2	5	1				x		x	x	x	x	x	x	
												(6)													
SMN#2	1																		x						
SMN#3	3	5		1			1	4				1	1				x		x		x				
ST 45								1	4								x				x				
ST 46																	x								
Sub-Tot.:								1	4								x				x				
SMN#14	3						6												x		x	x			
ST 47								1									x		x*					x	
ST 48								1									x		x*		x				
ST 50		1						1	1										x*		x			x	
ST 51	1	18		1				10	1			1					x		x	x	x	x			
FT 5	3	10				1	1	8	1	8		1	1	1			x		x		x	x			
ST 52	3	7	1					2	1	3			1				x		x	x					
FT 6	10	22	1					2	4	3	7	7					x		x						
ST 53	1	3			1	1		1	1			1					x		x	x		x			
ST 54								4	9								x								
ST 55										2							x								
Sub-Tot.:	24	60	3	1	1	2	3	7	3	5	1	7	3	1	1	1	x		x	x	x	x	x	x	
ST 56			1					2									x								
ST 57								1																	
ST 58								2													x				
ST 59																					x*				
ST 60								1		1							x		x		x	x	x		
Sub-Tot.:			1			3		3		1							x		x		x	x	x		

Table 6. Summary of Cultural Evidence Found in Area C (1977 & 1985).



Table 7. Area C Test Units -- Depth of Historic and Prehistoric Evidence.

Area C (S half) (Figure 8, 16, 19, 21, 22; Table 6)

The southern part encompasses the lower, more level inland part of the ridge between the lake and river. Most of it appears rather disturbed as it was gardened for many years and possibly cultivated on a larger scale before that (Figures 16 and 21); in 1951, further disturbance was caused by some filling and grading as the new access road was built right across the terrace.

ST1-10 and FT2 and 4, as well as SMM#2 and 3 in 1977, were all put in at 10-15 m intervals across this old plow horizon. Most of them produced some evidence--similar in character to that from ST51-54 and FT5-6 but less concentrated. The test profiles indicate that although there is considerable sign of disturbance in the upper levels, with much mixing of prehistoric and historic evidence, there is definitely a fairly deep and undisturbed portion of cultural deposit below the plow horizon (Table 7). This was evident in ST2, which was expanded into a 50 x 100 cm unit in order to investigate an apparent feature--an approximately circular, 40 cm wide and 25-30 cm deep pit-like intrusion of dark and mottled loamy sand and much charcoal and debitage as well as ceramics, all in a matrix of lighter yellowish brown sandy loam. With its very vertical walls, it has the appearance of a storage pit. FT4, located less than 8 m east of ST2, was a 50 x 100 cm unit which produced evidence of two intersecting fire pits, with a pile of cobbles and small boulders along one side (possibly used as a wind shield or support for a pot (?)--the rocks are cracked and discolored from the heat). In this spot, the old plow horizon seems to have been removed and replaced by two different layers of fill--presumably during the 1951 road construction. Below that fill, from 30 cm down, the features stand out very distinctly (Figure 22). The unit produced ceramics, debitage, grindstone fragments, FCR and some burnt bone.

Again, there seems to be little doubt that a fairly large portion of the cultural deposit remains rather intact and that some very valuable data about activity areas, subsistence patterns etc. could be extracted from this terrace.

Area D (Figures 8, 16, 20, 21 and 23-26; Table 6)

Now a rather level terrace with a view east across Big Sandy Lake, this area would have overlooked an extensive swamp prior to the construction of the dam (Figures 3-5).

During parts of the postglacial period, however, for example during the later Archaic, cooler and moister conditions caused a natural rise in lake levels; at that time, this spot could have been just as pleasant as it is today. This fact may be the reason why most of the cultural evidence found in this area appears limited to an early, aceramic occupation--probably a late Archaic one as copper items were found in two of the units.

Area D has also been affected by the old garden as well as the road construction (Figures 16 and 21). The tests that were most productive, however, were located either well outside or just within the edge of the old garden. One formal test unit was excavated in this area, FT3, and it was placed near ST14 which had produced one piece of hammered copper as well as a considerable amount of debitage, bone and FCR. Although FT3 did not produce any copper, it was still one of the richest units excavated. Within a context of partly distinct, partly overlapping fire-stained features, some with a distinct basin shape, there was a dense scatter of debitage (particularly small flakes not common in any of the other units), bone, charred seeds, FCR including numerous grindstone fragments, several finished implements including a rather crude scraper and a biface. There was also a piece of red ochre. The character of the evidence is definitely preceramic and Archaic; what is surprising is the shallow depth of the cultural deposit in this and adjacent excavation units--most of the finds were made in the 25-30 cm level (Table 9). It is possible that this part of the terrace has lost some of its top soil through landscaping as it seems almost unnaturally level at this spot. (See further Figures 23-26.)

FT3 appears to be located within an area of quite intense prehistoric activity--lithic tool manufacture/maintenance, possibly copper working, definitely food processing and preparation. Fairly similar evidence in ST15, 16 and 17, located 15, 10 and 18 m from FT3 respectively, suggests that this activity area might be fairly extensive and well preserved and that most of it would have escaped serious disturbance from past gardening and/or plowing.

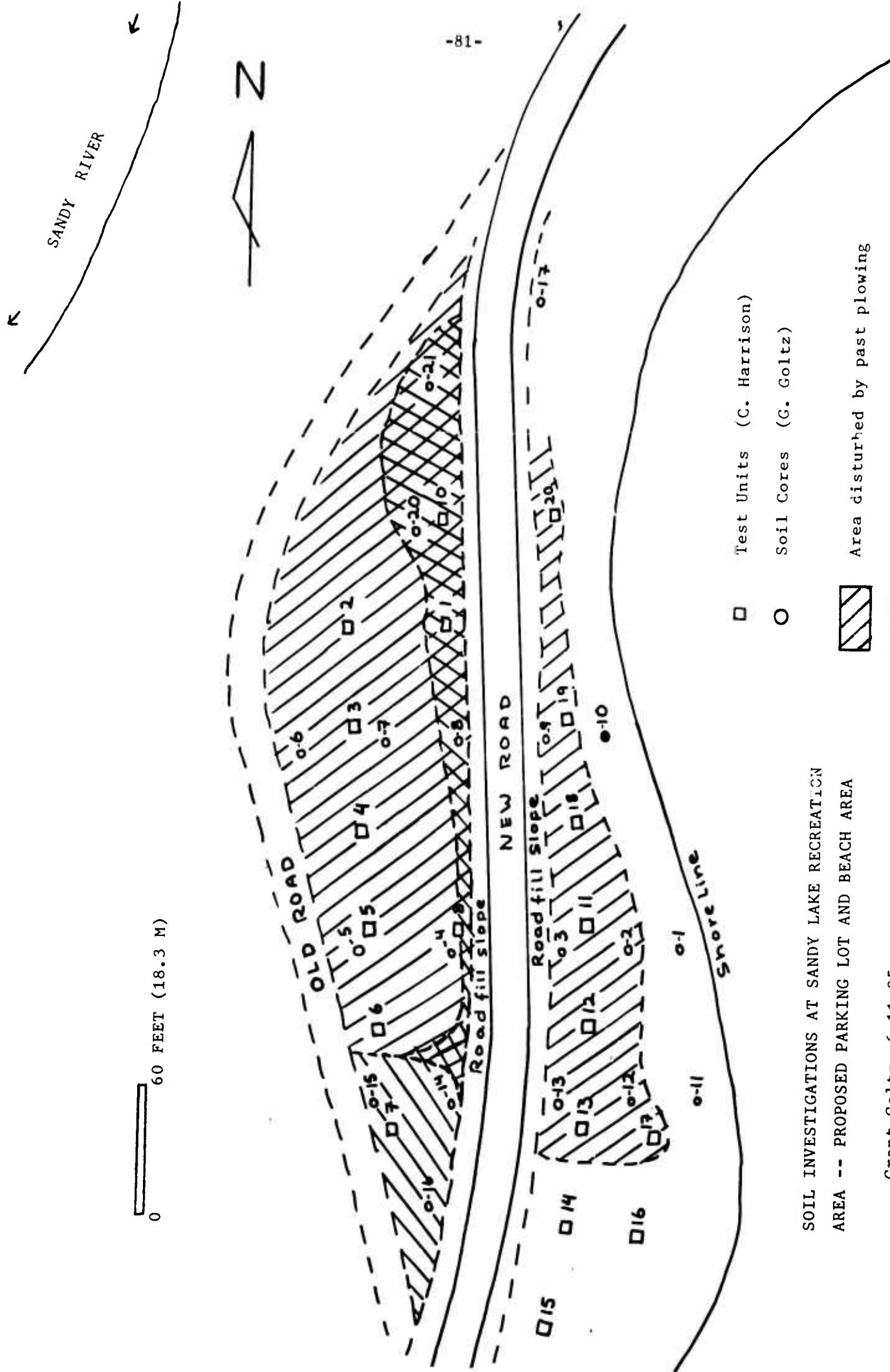
The northern part of Area D produced very sparse evidence and probably contains little more than a scatter of lithics. The aceramic character of the 1985 Area D units contrasts sharply with that of Area C across the road. It is curious, however, that some ceramics were found in this area in 1977, by the SMM team, in their test #5 down closer to the lake. The sherds all come from the same



Figure 19. View from point between ST1 and ST2 looking S across ST3-8 (above); view S along access road built in 1951 (below).



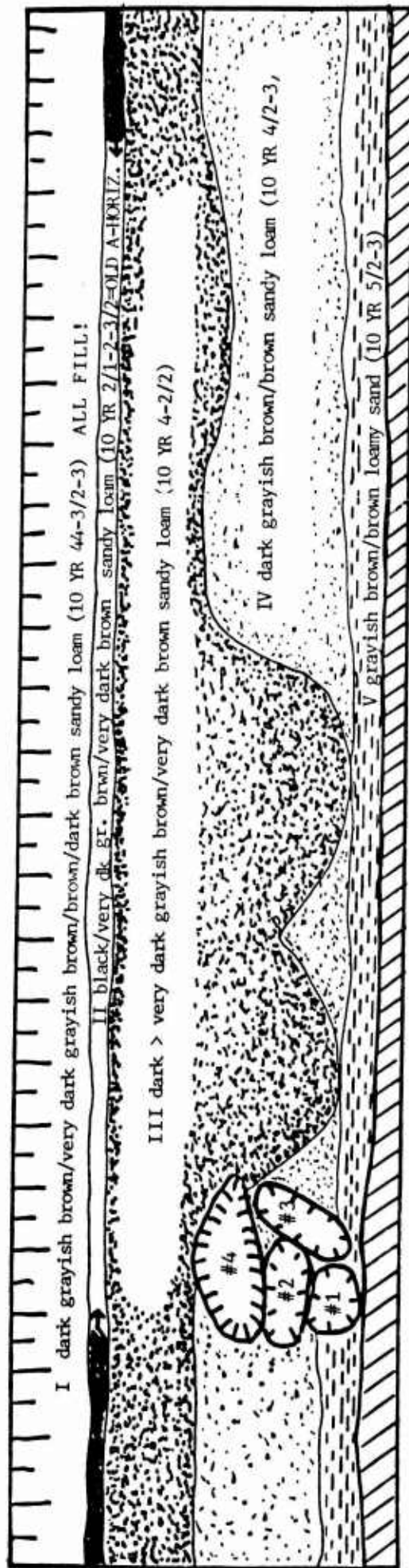
Figure 20. General views S and S/SE across Area D, showing the locations of ST14-19 (above) and ST14-18 (below).



SOIL INVESTIGATIONS AT SANDY LAKE RECREATION
AREA -- PROPOSED PARKING LOT AND BEACH AREA

Grant Goltz 6.11.85

Figure 21. Results of Soil Investigation in Areas C & D.



South Wall

Fire damage and discoloration on basal part and northern side of all four cobbles and boulders

#1 granite -- somewhat darkened and cracked

#2 granite -- reddish and cracked

#3 coarse-grained granite

#4 basalt -- one corner cracked; another side features depression with "pecking scars" -- possibly an anvil.

Soil samples from levels I - V have been curated with the cultural evidence.

0-10 cm: iron hook, glass fragment, 2 body sherds, FOR
10-20 cm (E₂): nail, concrete, debitage, FOR
10-20 cm (W₂): 4 body sherds, flake, shatter, FOR
20-30 cm (E₃): body sherd, 2 flakes, FOR
20-30 cm (W₃): 2 " 4 " , FOR, burnt bone
30-40 cm: flake fragment, 2 burnt bone fragments

West Wall

North Wall

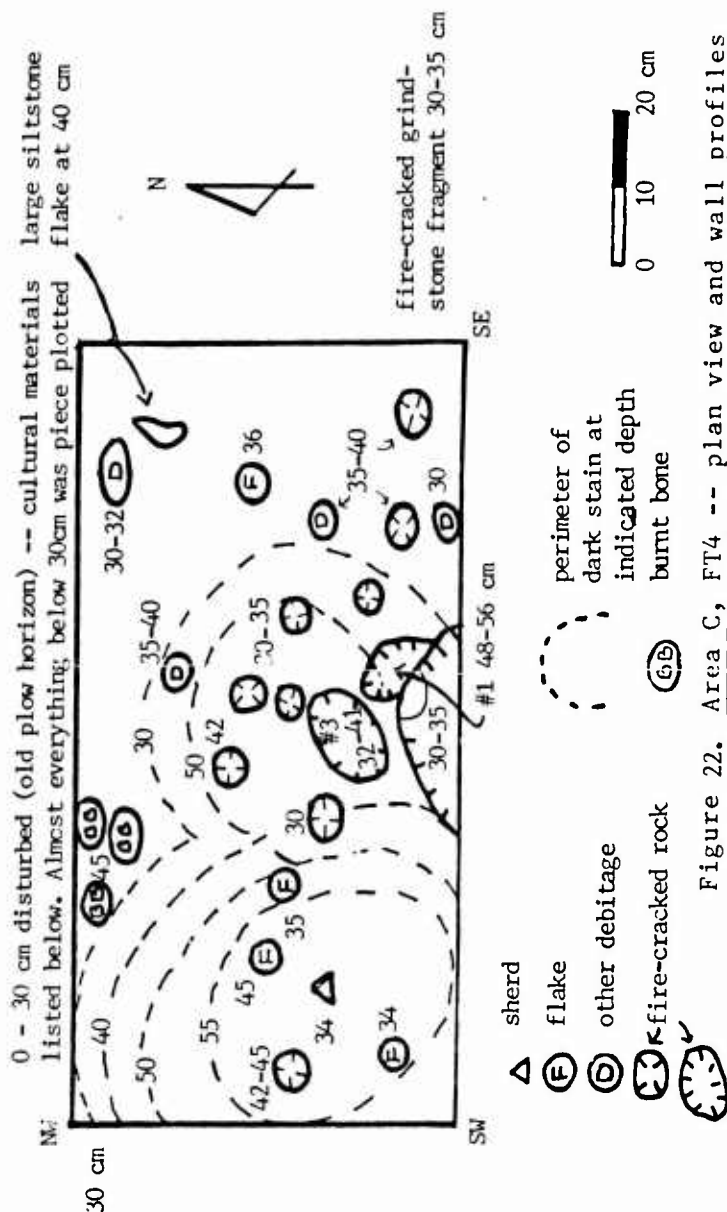


Figure 22. Area C, FT4 -- plan view and wall profiles

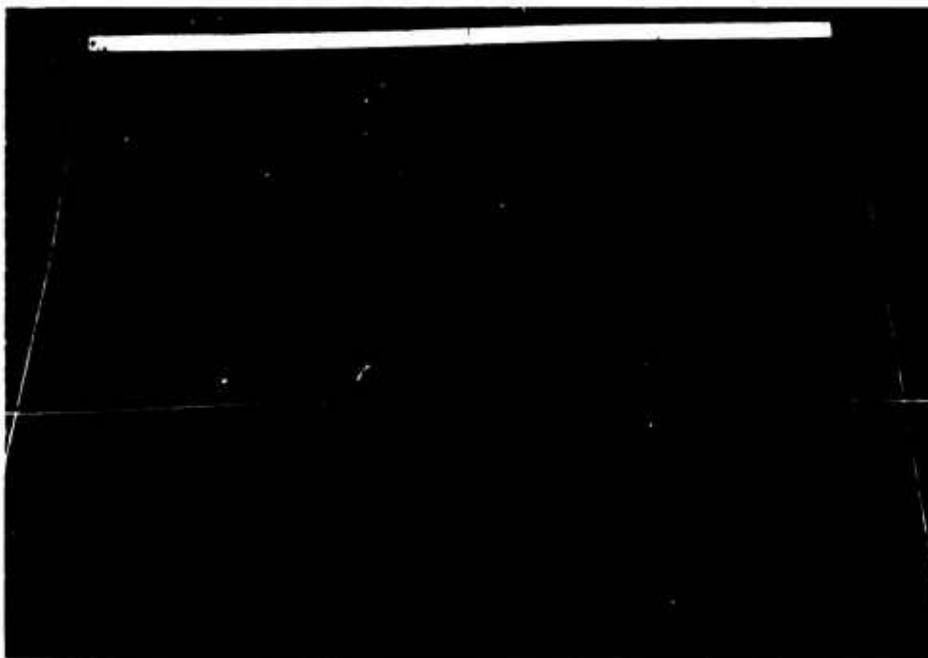


Figure 23. Area D, FT3 (northern part) at 25 cm depth.

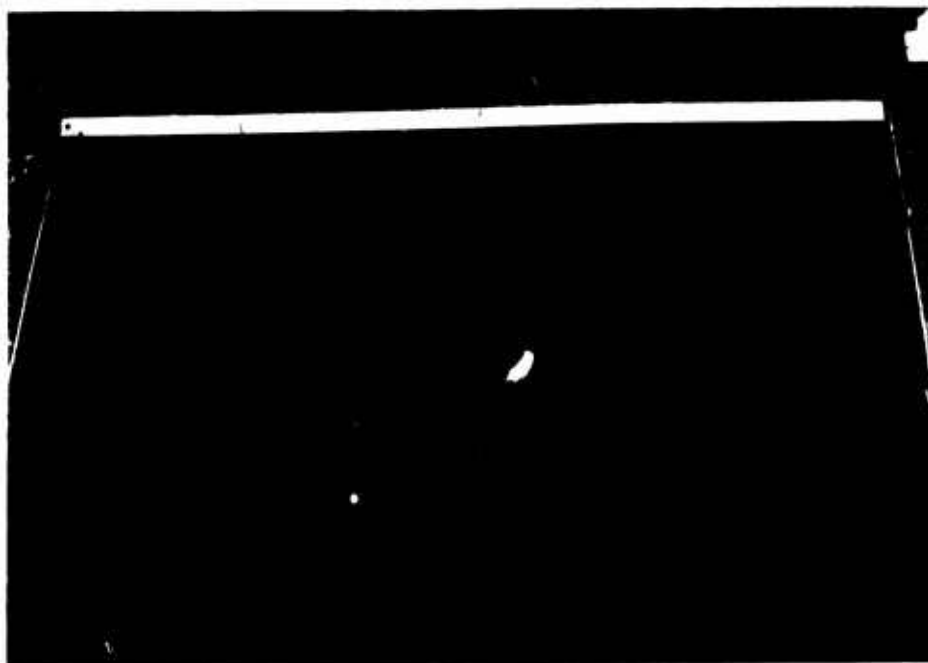
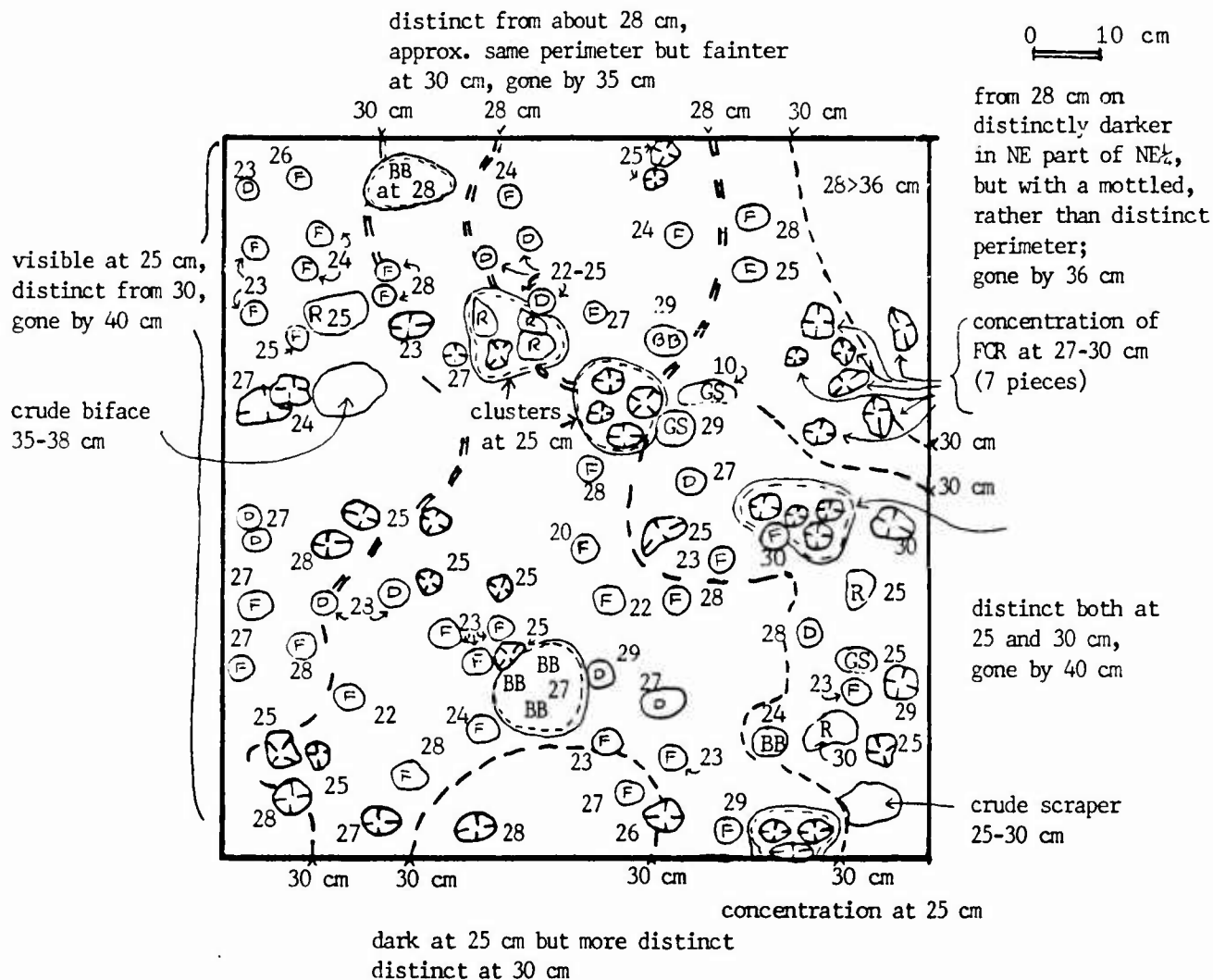


Figure 24. Same as above, at 30 cm depth.

0-10 cm and 10-20 cm levels -- nothing piece-plotted except for a grindstone at 10 cm.

Lower levels: all piece-plotted with the exception of some small flakes and bone fragments found in screen.



20-30 cm: Greatest conc. of cultural material (twice as much as in 10-20 and 20-30 cm levels) From ca. 22 cm, generally darker soil with much staining by charcoal. Rather mottled -- patterns more distinct between 25-30 cm. Numerous charcoal specks scattered in darker soil. Also many FCR and BB fragments.

30-40 cm: More compact sandy loam with darker stains continuing through upper part of level. Between 34 and 38 cm change to looser, coarser sand.

40-50 cm: Lighter colored, coarse sand with pebbles (like a beach deposit). Hardly any cultural evidence.

distinct perimeter at indic. depth
mottled " " " "

concentration

flake

other debitage

grindstone

fire-cracked rock (FCR)

other rock

burnt bone fragment

Figure 25. Composite plan view map of FT3 in Area D.

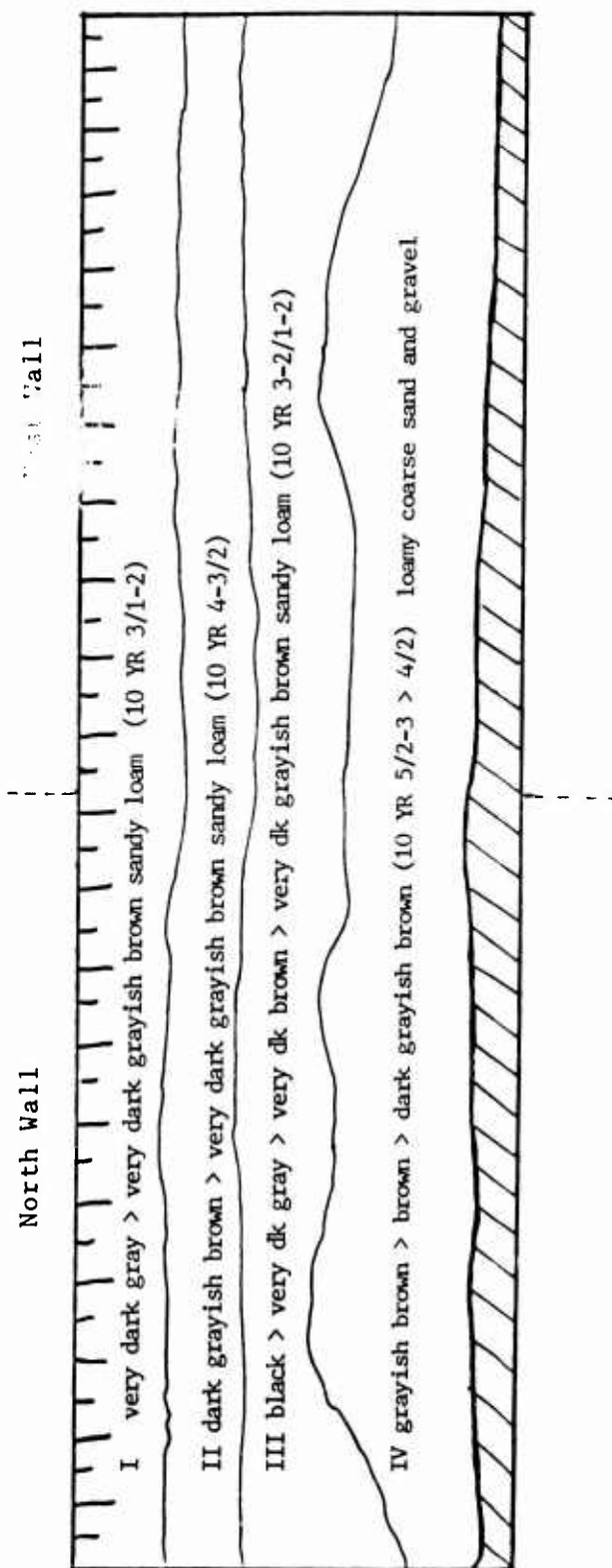
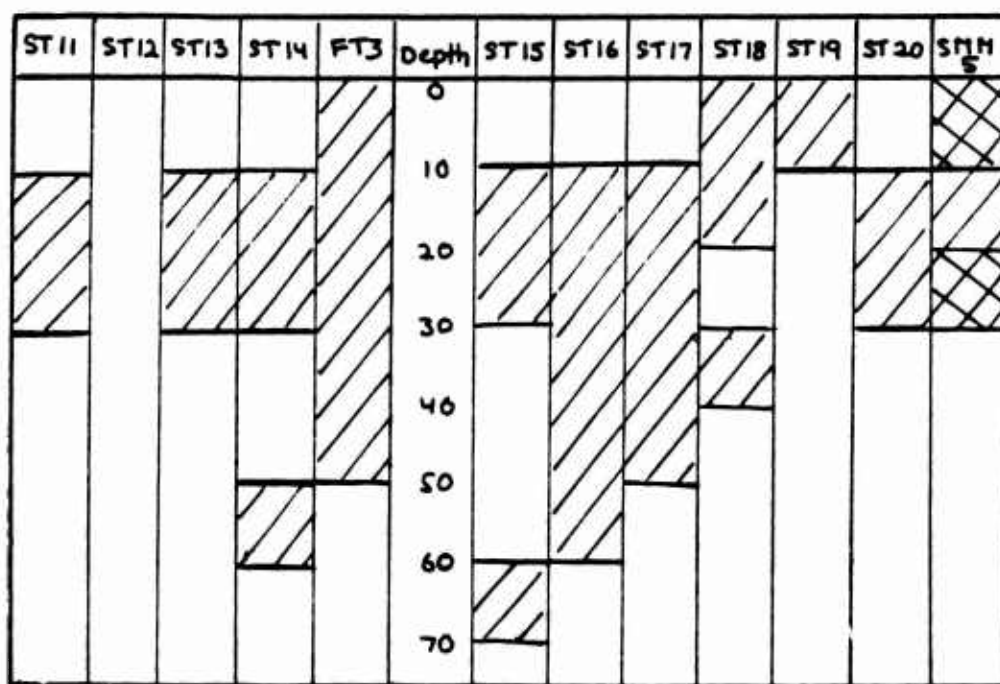


Figure 26. Area D, FT3 -- selected wall profiles.

	Rim/Neck Sherd	Body Sherd	Projectile Point	Scraper	Lge Biface	Med.-Small Biface	Flake w. Retouch/Use Wear	Retouch/Rejuven. Flake	Tertiary Flake	Decortication Flake	Shatter	Core/Checked Piece	Abrader/Polisher	Grindstone	Hammerstone	Copper	Gunflint	FCR	Faunal	Charred Seed	Charcoal	Historic Metal	Historic China	Historic Glass	Historic - Miscellaneous
ST 11									1	2	1			1				x							
ST 12																									
ST 13									2	1	2			1				x	x						
ST 14									2		5			1		1		x	x						
ST 15									1					1				x	x						
ST 16									1		5	2		1	2	1		x	x					x	
ST 17									1		6	7		1				x	x						
ST 18									1	1								x	x						
ST 19									1																
ST 20									1									x							
FT 3									1	1	1	1	13	80	4	34	3	11		x	x	x	x	x	
									1	1	1	3	13	100	8	51	3	1	18		x	x	x	x	x
SMM 5		5							5	2									x	x		x			

Table 8. Summary of Cultural Evidence Found in Area D (1977 and 1985)





 lithics
 lithics & ceramics

Table 9. Area D Test Units -- Depth of Prehistoric Evidence.

vessel and are quite different from any other ceramics found on this site--smooth-surfaced, reddish, unusually smooth also in texture. They may derive from a spatially rather limited cultural deposit which dates from a brief encampment at a time later than the main use of this area. The clay used from this vessel is very similar, possibly identical, to that found in a deposit along the north shore of the lake (Timothy Ready, personal communication).

V. DESCRIPTION OF FEATURES, ARTIFACTS AND ECOFACTS

Lab Procedures

All evidence recovered by the 1985 investigation was cleaned and sorted by ARS staff. Christina Harrison performed the lithic and ceramic analysis, the latter in consultation with Christy A.H. Caine. The faunal analysis was done by Orrin Shane of the Science Museum of Minnesota.

The evidence has been accessioned with the Hamline University system and will be curated at that institution. A comprehensive list of all excavated items can be found in Appendix D.

A standard attribute analysis of the ceramic and lithic artifacts was followed by the attempt to tabulate their frequency and distribution within the site. As relatively few of the test units proved undisturbed enough to allow for meaningful statistical analysis of vertical distribution patterns, it was determined that such an effort would be premature and possibly more misleading than informative. Consequently, statistical inferences were limited to an analysis of the horizontal distribution patterns of lithic artifact and raw material types, i.e., observations that would be largely unaffected by 19th and 20th century impact but which could still yield information about variations in site usage and raw material procurement.

Features

Several distinctive features were identified during the 1985 investigations:

- in ST2 (southern Area C, under the old garden), a 40 cm wide and 25-30 cm deep pit which may have served as a storage pit (above, page 72);

- in FT4, less than 8 m east of ST2, two intersecting fire pits as well as a possible windbreak or support structure of cobbles on one side, as described on page 75 and in Figure 22;
- in FT3 (Area D, south of the old garden), several overlapping fire-stained areas, some with a distinct basin-shape (Figures 25 and 26).

Another feature was recorded, but not excavated, in Area D: a distinct, horseshoe-shaped depression surrounded by embankments on three sides, open towards the lake (Figure 16). This would appear to be the remains of a historic structure, possibly some kind of a shed along the shore line.

Area B also features a couple of depressions first described in the 1975 report by the University of Minnesota team. One of them, an oval, circa 3 m by 4 m large and, at the center, roughly 10 cm deep depression, was tested in 1975 by means of a 1 m by 2 m trench taken down to 45 cm depth. The wall profile of the trench showed a thick layer of cobbles throughout the unit, beginning at 15 cm below the present surface and curving in the same manner as the contour of the depression. The soil profile indicated that the top soil above the rock layer had developed for a considerable amount of time. This upper zone contained both recent historic and prehistoric evidence while the cobble layer proved sterile. The depression is circled by a very slight embankment. A second, less distinct depression of comparable dimensions is located due east of the first. The shape of both suggest that they are the remains of prehistoric or early historic dwellings with sunken floors (Johnson 1975). Corps of Engineers records, including old photographs of the area, do not show any historic structures. It should be noted, however, that a sterile boulder layer also was encountered in FT1, on the ridge north of the dam, this time at a greater depth (approximately 40-60 cm) and underneath a considerably earlier, probably preceramic, occupation level.

Ceramics

The 1985 investigations produced a number of rim, neck and body sherds, most of them from the southern part of Area C. The rim and neck sherds represent very small segments of each particular vessel. They do, on the other hand, derive from quite a number of different ones, a total of nineteen containers. One vessel would have been of a Middle Woodland variety, probably related to

Malmo or Laurel Ware; this sherd was found in Area A (ST41/FT1). The other rims and necks all from Area C, show a Late Woodland affiliation and seem to represent eight Blackduck vessels, one possible Sandy Lake vessel and two vessels of a general late prehistoric character. In addition, four other rims derive from early Blackduck vessels with certain St. Croix ware traits; another two were decorated in an Onamia or "careless Blackduck" style; all six would date from the transition from late Middle Woodland to early Late Woodland. One rim sherd was too small to be identified as to cultural affiliation.

A more detailed description, based on criteria taken from A Handbook of Minnesota Prehistoric Ceramics (Anfinson, ed., 1979), can be found in Appendix F. Selected sherds are shown in Figure 27.

Twenty-two types of body sherds were found. Due to the common variability of coloring and temper size within Woodland vessels, some of these "types" may derive from different parts of the same vessel. Each type has been described, briefly, in Appendix F. Two of the bodysherds were found on the northern ridge, in Area A (ST33 and 34). Both are cord-marked on the exterior, with grit-temper, and appear to derive from a Late Woodland vessel. Two or three of the other body sherd categories (all from Area C) display the characteristic smooth exterior and thickness of Middle Woodland ceramics; the rest are all cord-marked on the exterior and typical of the later Woodland period.

Lithics

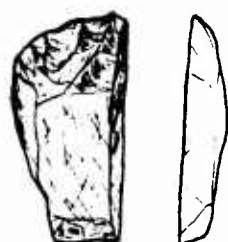
A number of diagnostic lithics were found during the 1985 investigation. A summary of their distribution can be found in Tables 4, 6 and 8. Selected examples are shown in Figure 28-30. For the sake of brevity in the following descriptions, the dimensions of these lithics (all expressed in millimeters) are arranged in a sequence indicating maximum length/maximum width/maximum thickness.

British Gunflint (FT 5:0-10 cm): 18.1 x 18.5 mm wide and 6 mm thick; made of very dark gray/very dark grayish brown flint.

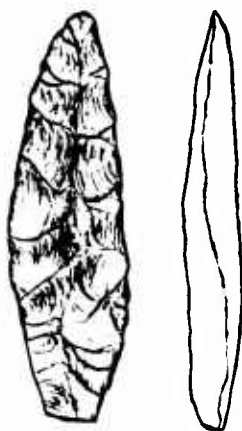
Side-notched Triangular Projectile Point (FT 2:20-25 cm): made on tertiary flake of very oolitic jasper taconite, with skimming, trilateral flaking on ventral side and, on



Figure 27. Rim Sherds from 21 AK 11 (#19, left; # 8, center; # 3, right)



scraper, ST 34



biface, FT 1



projectile points from FT 2 and ST 50



scraper, FT 3



biface, ST 56

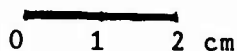


Figure 28. Lithic Artifacts from 21 AK 11

dorsal side, steeper, quite beveled lateral retouch and thin, skimming basal retouch. Straight to slightly excurvate blade with fairly plano-convex cross section. Dimensions: 15/14/3.3 mm.

Asymmetrically Triangular Projectile Point (ST 50:30-40 cm): of brown chalcedony, made by irregular, skimming, trilateral flaking and lateral, bifacial, quite regular retouch. Excurvate blade, somewhat incurvate base, biconvex cross section. 18/15/3.6 mm.

Small Triangular Projectile Point (ST 52.0-10 cm): of orange chert, shaped by quite regular and skimming trilateral, bifacial flaking and even, bilateral, bifacial retouch. Excurvate blade and base; biconvex cross section. 18/13/3.5 mm.

Triangular Projectile Point (FT 6:0-10 cm) made by minimal modification of a primary decortication flake of grayish-pink chalcedony--with intermittent, minute bilateral flaking, mostly on ventral side. Base shaped by natural hinge fracture. Excurvate blade, fairly straight base. Plano-convex cross section. 12/2/3 mm.

All four points are variations of the Late Prehistoric "Eastern Triangular" projectile point type that is widely distributed in assemblages throughout Manitoba, western Ontario, Minnesota and Wisconsin. In northern and east-central Minnesota, it is associated with Blackduck and Kathio Series ceramics (ca. A.D. 800-1400). Figure 28.

Fractured End Scraper (ST 34:40-50 cm) is made from a secondary decortication flake of jasper taconite, with fairly steep, rather irregular, unifacial retouch (bevel angle of $55\frac{1}{2}$). 29/15 (as preserved)/7 mm.

Small Side Scraper (ST 2, Extension:10-20 cm)--asymmetrical tertiary flake of white quartz with irregular, unifacial retouch along one lateral edge (bevel angle average $60\frac{1}{2}$). 16/12/3.3 mm.

Crude Side Scraper (FT 3:25-30 cm): a thick, asymmetrical, primary decortication flake struck off a waterworn cobble of brownish jasper, with crude unifacial retouch along one edge (bevel angle ca. $60\frac{1}{2}$). 75x60/16 mm.

Crude side scrapers of the third kind are commonly associated with rather early prehistoric assemblages (Bleed 1969; Shay 1971). They are common in the Reservoir Lakes collection of the Duluth area.

The other two specimens belong to types with a wide and long-lasting distribution that spans both the Middle and Late Prehistoric periods. Figure 28.

Crude, Roughly Ovate Chopper/Cleaver (ST 51:30-40 cm), made from a flat basalt cobble with part of the original weathered cobble surface preserved on both sides. Shaped by crude, irregular, bifacial flaking around ends and along one side, with more minimal shaping along the other creating a naturally backed edge for gripping. One end is rounded, the other tapers to a sharp point. 180/110/37 mm. Figure 29.

Fractured Crude Biface (FT 3:55-38 cm), made on large secondary decortication flake of basalt, minimally modified by large, irregular flake scars, primarily on the non-cortical face. 70 (as preserved)/96/24.

Fractured Ovate Biface (ST 56:30-40 cm) of very weathered siltstone, shaped by irregular, bilateral flaking, with somewhat sinuous edges created by the tertiary flaking as well as by irregular, crude retouch. Biconvex cross section. probably used for cutting, scraping. 60/60/12. Figure 28.

Bifaces like the three just described are common in early assemblages such as the Late Paleolithic Reservoir Lakes complex and early Archaic sites.

Asymmetrically Lanceolate Biface (FT 1:36 cm), of yellowish/white orthoquartzite ("Hixton Quartzite"), shaped by skimming, obliquely parallel and very even flaking on one side, by bilateral, skimming but much steeper and median-forming flaking on the other. Fairly regular, bilateral retouch all along both lateral edges but more pronounced on one face. Convex-diamond shaped cross section on basal third; rhomboid cross section elsewhere. Entire blade is slightly twisted. Rounded distal end may have served for engraving/perforating. 54/17/6.8. Figure 28.

The refined flaking used on the biface from FT 1:36 suggests a fairly early date. It was found in the level below the Middle Woodland sherd described above (p. 94).

Fractured, Crude Preform (ST 53:30-40 cm) of reddish chert, apparently approximately lanceolate before fracture, shaped by irregularly spaced, very rough bifacial flaking. Irregularly biconvex cross section.

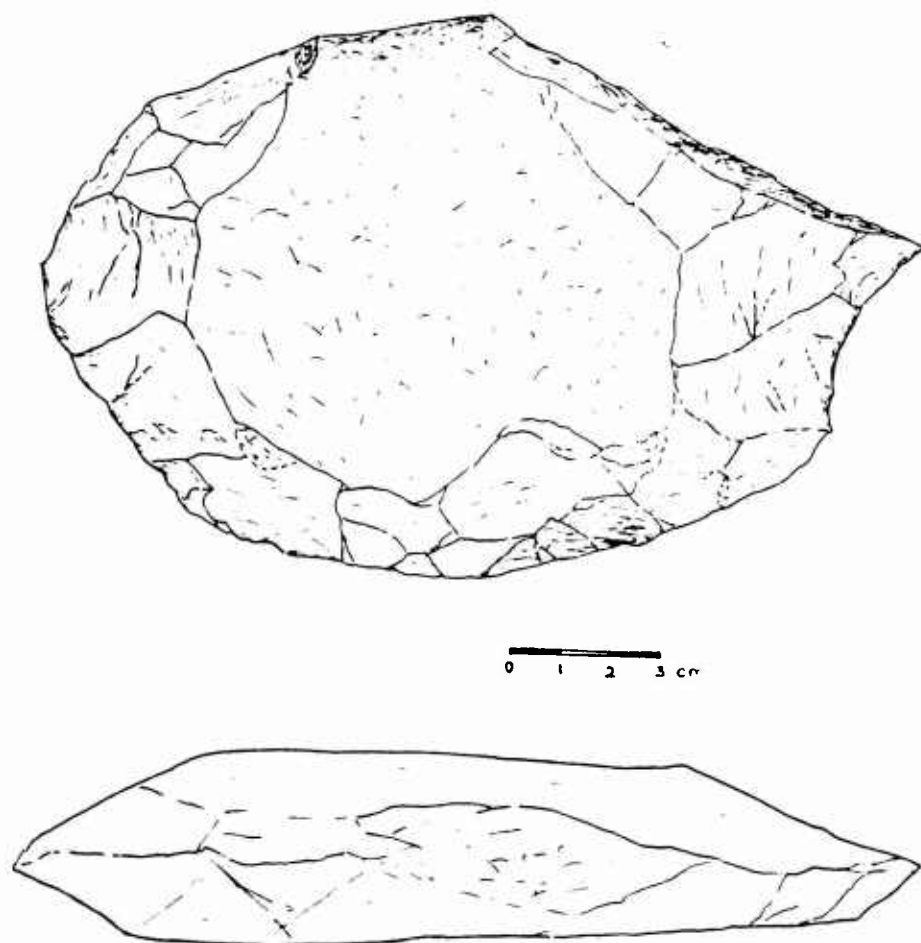


Figure 29. Large Biface from 21 AK 11, ST 51

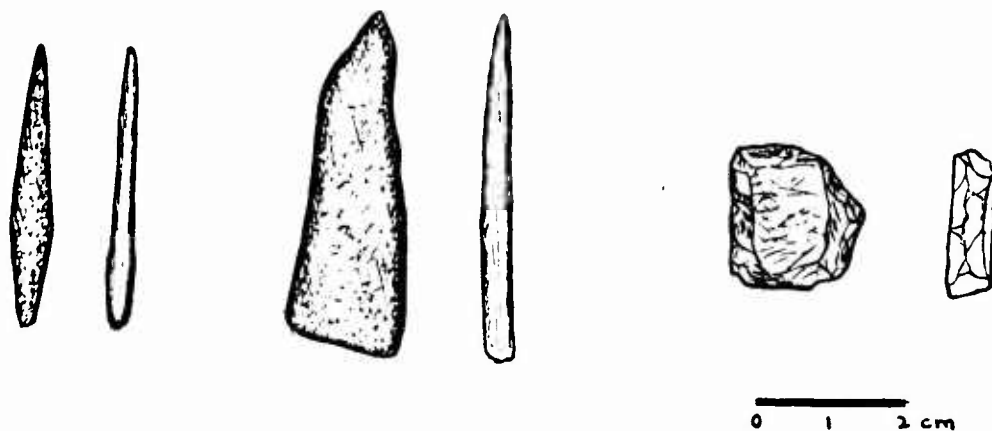


Figure 30. Native Copper Items and Gunflint from 21 AK 11, ST 14 and FT 5.

29 (as preserved) by 28 mm in length and width; 12 mm thick.

Thin lanceolate Knife (FT 3:34 cm)--a small cutting tool made from a thin tertiary flake of white quartz, shaped by skimming, irregular, bilateral flaking on both sides, as well as by irregular, minute retouch along both edges. Asymmetrically lanceolate, with flattened biconvex cross section. 20 (as preserved)/16/4.2 mm.

These last two bifaces are both of a very general type that occurred widely and for a large part of the prehistoric period.

Seven of the larger flakes that were found in Areas C and D have been somewhat modified for cutting/scraping: four of these are of siltstone (ST 2:40-50 cm and 50-60 cm; ST 53:20-30 cm and ST 16:20-30 cm); two are of jasper taconite (FT 5:20-30 cm and FT 3:36-38 cm), one is of granite (ST 17:0-10 cm). The fairly large size of these flakes as well as the choice of raw material have close parallels in preceramic/aceramic assemblages described for northern Minnesota (Harrison 1985).

Finally, there were a number of grindstones as well as a few hammerstone (all of some igneous rock such as basalt or granite--see Table 10). Generally fire-cracked, they usually survived in such small fragments that nothing definite could be said of their size or shape. Most appear to derive from different specimens. Three of the four hammerstone fragments came from Area A, which also produced three grindstone fragments--together, they represent somewhat more than 9% of the total lithic assemblage in that area. Areas B and C yielded even fewer artifacts of this kind. In Area D, again, grindstone fragments are quite common constituting more than 85% of the total number of lithic items, most of them from FT3.

The rest of the lithic items that were found in the 1985 units were all biproducts of tool-making. Table 11 and Figure 31 show the distribution of the various debitage categories across the site area (Area B excluded as neither the 1975 or the 1977 reports specified what types of flakes had been retrieved). With few exceptions, the percentages are quite similar for all the subareas. In all, there is very sparse evidence of the earliest steps of the lithic reduction sequence. No cores (though one was reported from one of the 1975 units in Area B), only a few chunks of potential raw material that appeared to have been test flaked in order to assess the quality and

Sub Area	Chert	Agate	Brown Silica	Other Silica	Jasper Taconite	Jasper	Siltstone	Quartz	Quartzite	Basalt (flaked)	Basalt (other)	Granite (flaked)	Granite (other)	
A	20	--	--	--	4.8	1.6	6.5	38.7	3.2	14.5	4.8	--	4.8	%
C(N ₂)	7.9	0.7	11.4	3.6	2.8	1.4	30.7	33.6	0.7	5	--	--	1.4	%
C(S ₂)	11.6	0.6	2.3	2.9	6.4	0.6	5.2	55.2	5.2	5.8	2.9	--	1.2	%
D	22	1	2	5	6	0.5	4.5	41.1	2.5	7	4	0.5	4.5	%

Table 10. Lithic Raw Materials, Type and Provenience, 21 AK 11 (1985)

	Core	Checked Piece	Decortic. Flake	Tertiary Flake	Retouch/Rejuvenation Flake	Shatter
Area A	1.8%	3.6%	8.9%	55.4%	---	30.3%
Area C (N ₂)	0.8%	3.3%	0.8%	62.8%	2.5%	29.8%
Area C (S ₂)	2.2%	3.3%	---	52.7%	2.2%	39.6%
Area D	1.7%	4%	2.3%	56%	7.3%	28.7%

Table 11. Debitage Categories Found in Areas A, C and D, 21 AK 11 (1985)

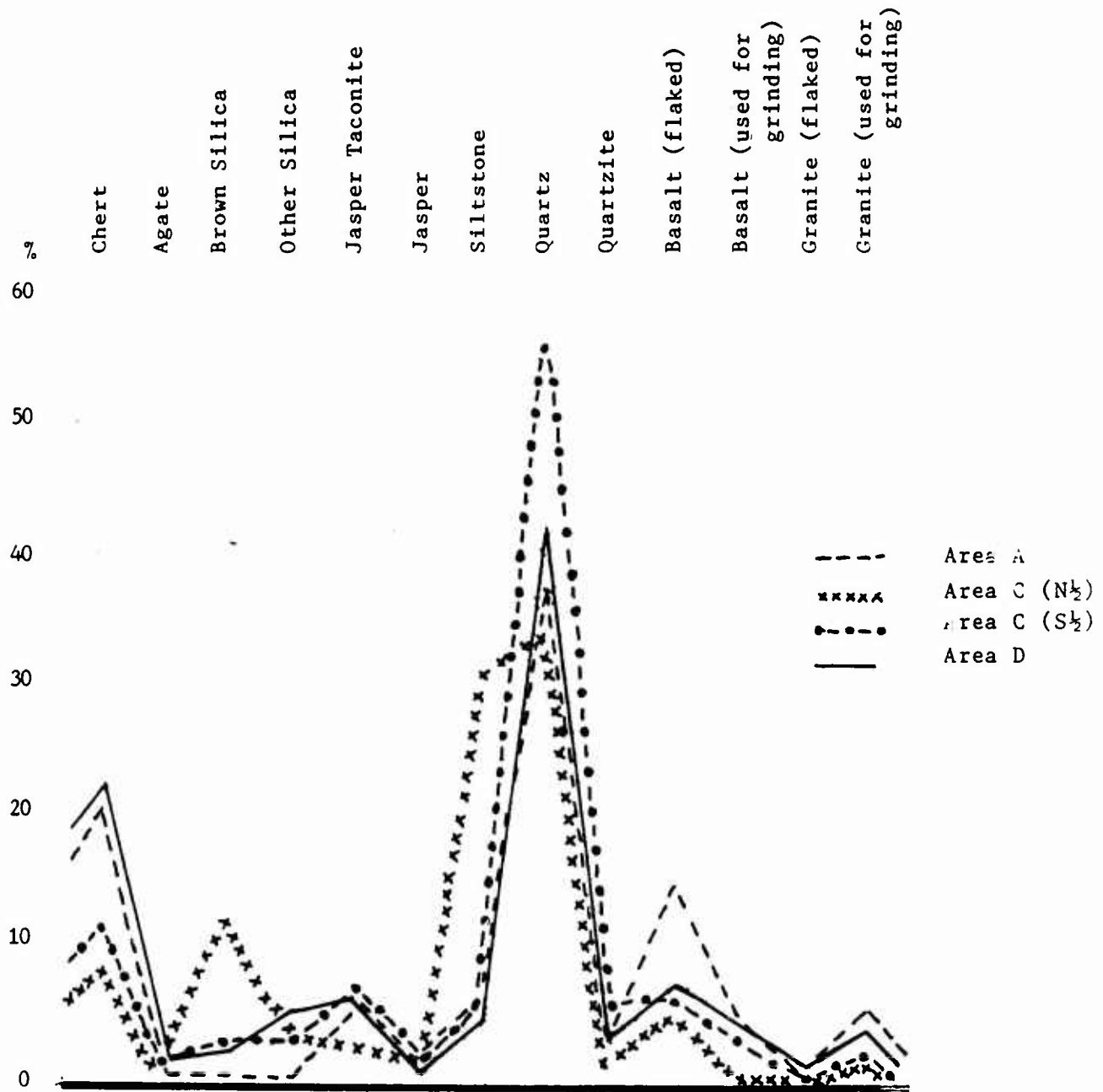


Figure 31. Lithic Raw Materials in Areas A, C and D, 21 AK 11 (1985)

flakeability. There were also a few decortication flakes. Tertiary flakes and pieces of shatter were by far the most common forms of debitage and often occurred in concentrations that suggested the presence of lithic work areas.

The apparent paucity of cores and decortication flakes suggests that many of the lithic artifacts found at 21 AK 11 were fashioned from preforms that had been roughed out elsewhere. More curious is the fact that retouch and resharpening flakes were almost nonexistent in all of the 1985 units except FT3 (Area C). This is all the more surprising in view of the consistent use of 1/8 inch mesh during the formal testing.

Table 10 shows the types and frequencies of lithic raw materials within the total 21 AK 11 assemblage (with the exception of the British gunflint which is in a class by itself and clearly represents an exotic type of siliceous material). Figure 31 gives a graphic representation of the relative frequencies within Areas A, C and D (again, Area B had to be excluded due to insufficient detail in the analysis of the debitage). Quartz (almost without exception white and opaque) was the most common material in all three areas, but most strikingly so in the southern part of Area C. Siltstone ranks second in the northern part of Area C but comprises less than 6-7% elsewhere; the same area produced a fairly large number of brown chalcedony flakes which also were quite rare elsewhere. In all other areas, chert comprises the second largest group. Within this category, there are some distinct variations in color and texture. It includes quite a few pinkish grey and white cherts that may have been heat-treated as well as a number of distinctly grey cherts and some flakes of a more granular reddish-orange, apparently heat-treated material. There are also quite a few items of basalt--either debitage and rather crudely flaked cutting/scraping tools or cobbles with facets worn smooth by grinding and polishing. Flaked basalt accounts for nearly 15% of the lithics in Area A but far less than 3% elsewhere. So far, these are the only distinct variations that could be indicative of preferential use of raw materials at different time periods and different localities. Other types--agates, white and grey chalcedony, reddish jasper and jasper taconite, quartzite--are all either quite sparsely represented or quite equally distributed.

Some of these materials occur locally in glacial deposits, others would have been brought in or bartered from elsewhere, e.g. the Hixton ortho-quartzite from

western Wisconsin, the brown chalcedony which may be Knife River Silica from North Dakota and the reddish-orange Tongue River Silica, also from the Dakotas. Some of the other chalcedony, a grey variety with dark inclusions, looks like Gunflint Silica from the Border Lakes area near Thunder Bay, Ontario; jasper taconite is known to have been quarried in large quantities in the same area; siltstone was extracted in the same fashion from the Knife Lake formation further west. The common occurrence of these last three raw materials throughout northern Minnesota and adjacent parts of Manitoba and Ontario suggests that they were systematically distributed by cultural means even though occasional chunks could have been found in local glacial tills.

Native Copper

Three items of this material were found in 1985 (Figure 30):

- an awl or broken gorge, in shape similar to Wittry's Group VII-B (Wittry 1957:216), which was found in FT 5:0-10 cm--an elongated lozenge shaped piece of hammered copper, fractured at one end and measuring 36/6/28 mm in maximum length/width/thickness;
- another hammered piece, suggestive of a broken knife blade, which was found in ST 14, at about 30 cm and which measures 45/15/3.5 mm in maximum length/width/thickness;
- a small nugget of unworked, but fairly solid copper, which was found in ST 16:30-40 cm, with a maximum diameter of 10.5 mm.

The two worked pieces would both seem indicative of a late Archaic component at 21 AK 11. Finds of copper spear points and "bands of copper" have also been reported from this site (above, Section II). The finding of an unworked nugget may also mean that some copper items were fashioned in this locality from introduced raw copper, the closest source of which would be the Snake River basin in Pine County some 60 miles to the southeast.

Faunal and Plant Remains

Fragments of completely carbonized seeds were found in Area C and Area D. Unfortunately, they were too small to be identified as to species.

A number of faunal fragments, burnt as well as unburnt, were also found in many of the 1985 units. Again, most are very fragmentary. A sample of the better preserved ones were brought to Dr. Orrin Shane at the Science Museum of Minnesota for tentative identification as well as a professional estimate regarding the degree of bone preservation/faunal research potential at 21 AK 11. Dr. Shane noted the remains of deer, beaver, hare, small rodents and turtle. In addition to these species, some fish bones were reported from the 1975-1977 excavations of Area B.

According to Dr. Shane, bone preservation should be fair to good at least for the evidence from the Late Woodland occupations.

Historic Evidence

A considerable amount of historic material was retrieved from a number of the units (Tables 4-6). As most of it seemed to be fairly recent, associated with the late 19th and early 20th century occupation of the dam area, no attempt was made to tabulate and analyze this evidence. It includes a large number of nails (some large square and probably handforged ones as well as later, round, wire-cut specimens), a large quantity of glass, both window glass and thinner, curved drinking glass fragments as well as some colored bottle glass, an assortment of china fragments, chunks of brick or mortar, some fragmentary pieces of sheet metal, probably from old cans.... All of these items have been saved and accessioned along with the prehistoric evidence.

The shallow depressions in Area B, interpreted by Eldon Johnson as possible prehistoric or early historic living floors, as well as a low, square/horseshoe shaped embankment in Area D, are features that may be of considerable research interest--at least one of them has already yielded a large number of historic as well as late prehistoric items (Section IV).

IV. CONCLUSIONS AND RECOMMENDATIONS

Condition of Cultural Deposit

Results of the 1975, 1977 and 1985 investigations at 21 AK 11 give a clear indication that:

- all reasonably high and well drained ground within the boundaries of the Sandy Lake Recreation Area is likely to produce some amount of prehistoric and early historic evidence;
- only a few, fairly limited portions can be written off as too disturbed to produce at least pockets of intact cultural deposit (mainly those areas deeply disturbed by the construction of a new office and maintenance building, a sewage treatment plant, the dam tender's residence and a comfort station, as well as a borrow area used during the 1951 construction of a new access road south of the dam);
- many other areas appear to contain well-preserved features and artifact configurations even under upper levels that have been disturbed by late 19th and early 20th century activities (e.g. the old garden);
- the remainder of the site remains fairly undisturbed even in the uppermost levels (e.g. the northeastern lobe of Area A, the eastern half of Area B, southwestern Area C and the southern part of Area D).

In addition to the fact that much of 21 AK 11 has escaped historic, cultural impact, it is worth noting that the area has been less affected by rising water levels than most other sites around the reservoir. Located at the northwestern corner of the lake basin, without any open water between itself and the prevailing winds, this site has not been exposed to the wind and wave erosion that has damaged so many other sites along the lakeshore.

Evidence of Past Site Use

The artifactual evidence at 21 AK 11 spans a large part of the post-glacial period, possibly going back as much as eight millennia, and appears to feature a more complete record of the regional cultural sequence than any of the other sites around the reservoir (Table 3).

The Early Prehistoric period is represented by at least two components:

- in northernmost Area C, a rather crude siltstone biface and some fairly large basalt and siltstone flakes, all with parallels in the Reservoir Lakes Phase of northeastern Minnesota (approximately seventh millennium B.C.);
- finds of native copper items both along the river below the dam and in some of the 1985 units in Areas C and D, including several with distinct late Archaic traits (third to early first millennium B.C.).

In addition to these diagnostic finds, there is the aceramic character of northeastern Area A, northernmost Area C and most of Area D, as well as the equally distinct lack of ceramics in the lower levels of all other subareas except B--a clear suggestion that early prehistoric use of this site included most of the upland area and was quite long-lasting and intense.

The earliest ceramic tradition documented in north central Minnesota, the Early to Middle Woodland Malmo/Kern Series (800 B.C.-A.D. 200), appears to be represented by a single neck sherd from Area A. A few plain, thick, grit-tempered body sherds from Area C would probably be of the same date and affiliation. Malmo ceramics tend to be associated with the earliest type of burial mounds--rather small, circular features--but there are no signs or reports of such structures at AK 11.

A few rim sherds from southern and central Area C appear to represent the period of transition between late Middle and early Late Woodland (A.D. 500-1000):

- a few sherds with the precisely executed cord-wrapped stick or comb impressions found on vessels of the St. Croix Stamped Series as well as on very early Blackduck vessels;
- also some sherds with the more loosely wound and widely spaced cord-wrapped stick impressions characteristic of the Onamia Series (not usually found this far north).

A larger number of rim and neck sherds, all from Areas B and C, display the more mature Blackduck traits of the 10th to 12th centuries A.D. The same areas have yielded

quite a few thin and cord-impressed sherds that may derive from the same or similar vessels.

By comparison, the Late Woodland period and the proto-historic period are poorly represented in the AK 11 assemblage. Except for what appears to be a Sandy Lake Ware rim in Area C, there are no diagnostic sherds from this later stage, though it is possible that a number of body sherds with fairly fine grit or sand temper and smoothed cord-markings on the exterior derive from Sandy Lake vessels. It is worth noting, however, that the site also lacks some other characteristic traits associated with Sandy Lake Ware and the Wanikan Culture, e.g. ricing pits and other evidence of wild rice harvesting or processing. This absence may appear curious considering the frequent occurrence of these ceramics and of ricing evidence on other sites around the reservoir; the question will be discussed further under Research Topics.

The British gunflint may be indicative of either a fur trade or historic Ojibwa presence in Area C--considering the location of this site, it is likely to contain as yet unexposed evidence of both. In 1774, a Northwest Company post (21 AK 4) was established on Browns Point circa one and a half miles south of AK 11 (Hudak and Ready 1978:179), and, adjacent to that locality, there are reports of a historic Ojibwa settlement along the shore of what then was the northwestern part of Sandy Lake (Figure 5). Examples of these finds are now on display at the Visitors Center just north of the dam. In the 1830's, the American Fur Company which originally, after the War of 1812, had moved to the former Northwest Company facility, relocated to a new post at the confluence of the Sandy and Mississippi Rivers (21 AK 52), a site less than half a mile west of AK 11. Some 20 years later, a William L. Wakefield established himself as a trader in the area, presumably on the location shown in Figure 4. Considering the above, as well as the continued use of the Sandy River as a part of the Savanna Portage route, it would be logical to assume that all of the high ground around the northwest end of Sandy Lake, including what is now the recreation area, was used at some time or another by both fur traders and historic Ojibwa.

The later half of the 19th century saw a period of intensive logging around Sandy Lake as well as frequent use of the river both for log drives and early steamboat traffic. The 1887 map shown in Figure 5 indicates that a logging dam preceded the 1895 dam built by the Corps.

The more detailed River Commission map (Figure 4) shows the area during the late 1890's and indicates the location of the new dam as well as the original town site of Libby.

Research Potential; Recommendations and Considerations for Future Site Investigations

As indicated by the preceding summary of the cultural evidence at AK 11, there seems to be considerable diversity in the distribution of the different cultural components across the site. While early components are found practically all over except in Area B and southwestern Area C, later site use seems to have been more selective and restricted to the central parts of Area A, to Area B and to the central and southern parts of Area C. This variability, along with the documented presence of at least intermittent areas of undisturbed cultural deposit, offers considerable opportunity for statistic, stratigraphic and paleoenvironmental analysis, should the various subareas be subjected to more intensive excavation.

At the same time, this variability in prehistoric land use along with the complex distribution of intact and disturbed areas, combine to make AK 11 a problematic and challenging site. Although it seems safe to assume that we now have the main outline of the cultural sequence and the general scope of 19th-20th century impact, the magnitude and complexity of the site area mean that a Phase III investigation would involve formal excavation on a fairly large scale even with the use of a sophisticated sampling approach.

Results so far also indicate that there are frequent more limited, but also more unpredictable disturbances caused by small scale, unrecorded 19th-20th century activities such as trash burial, stump removal, the burying of pipes etc. It would be advisable, therefore, to begin any future investigation with a soil resistivity investigation as well as more intensive close-interval soil coring; past experiences on other sites have shown these methods to be time and cost effective ways of charting hidden disturbances and buried features.

Suggested Research Topics

1. Previous surveys around the Big Sandy Lake reservoir have yielded quite meager evidence from the Archaic.

As suggested earlier, this situation may have been caused by the limited scope of these surveys which generally focused on the present shoreline. As shown by a number of recent investigations around the Mississippi headwaters, Archaic sites tend to occur at higher levels than those of the later prehistoric periods, frequently on ridges and old beaches that now lie at some distance from open water. Consequently, many Archaic deposits may have escaped detection during the shoreline surveys, while those at AK 11--all well above even the raised water levels of today--were identified due to the more extensive testing across the entire Corps administered recreation area.

The evidence from the other two, possibly three, Archaic sites around the reservoir is rather sketchy--mostly lithic artifacts in private collections. So far, AK 11 seems to be alone in having documented habitation floors and activity areas. This is particularly significant when one considers how few early prehistoric sites have been excavated elsewhere in northern and central Minnesota. In view of this, the early components at AK 11 take on both local and regional importance.

Our sketchy knowledge of the early prehistoric period makes it difficult to formulate specific research questions. It has been suggested that the absence of Early Woodland ceramics and the rather minor impact of initial Middle Woodland in this region could be explained by the continued presence of a highly efficient Archaic broad spectrum exploitation of the lake-forest environment (Steinbring 1974:70; Birk 1986:95). It would seem important to gather enough specific data to support or reject such a hypothesis. A closer look at the AK 11 deposits, with systematic exposure of fairly large habitation floors like that suggested by FT3 in Area D, and with consistent use of fine-mesh water screening, ought to provide enough data for a fairly detailed reconstruction of the early postglacial environment and the human adaptive responses to it.

2. 21 AK 11 has yielded nuggets of native copper as well as some finished artifacts. Further investigation of the copper producing levels would presumably yield a larger sample of both. Their presence indicates that at least some of the artifacts were fashioned at this site. If evidence of a copper working area could be

identified and documented, it would throw some light on a poorly known aspect of local Archaic technology.

3. The origin of this copper provides another interesting research topic. Several sources are known to have been used: copper producing localities along the Snake and, possibly, Kettle Rivers of east-central Minnesota, on Isle Royale in northwestern Lake Superior and on the Upper Michigan peninsula. Neutron activation analysis of the trace element variations in a number of copper artifacts and nuggets from the upper Great Lakes Region indicates a distinctive profile for artifacts from northern and central Minnesota as well as the copper from the Snake River deposits, information which suggests that much of the copper used in Minnesota came from that source (Aschenbrenner 1976). Similar analysis of some of the AK 11 items would presumably be equally informative for the reconstruction of regional procurement and exchange patterns.
4. The possible existence of a very early prehistoric component from the late Paleo-Indian (or initial Archaic) period is of particular interest considering that none of the other sites around the reservoir have produced anything that early. It would seem important to subject northernmost Area C to more intensive testing in order to verify the date of this deposit and supplement the rather sketchy evidence about this period.
5. The impact of wild rice harvesting on later prehistoric lifeways is well documented on sites throughout northern and central Minnesota, including a number of the sites around the Big Sandy Lake reservoir. As mentioned earlier, wild ricing related evidence seems conspicuously absent from AK 11. On the other hand, there is quite a bit of evidence regarding other aspects of the food economy--bones of various mammals, turtle and fish, as well as some charred seeds--organic remains which indicates that wild rice grains, if harvested and eaten, would have been present in the food refuse, and also that hunting, trapping and fishing were important activities.

A closer consideration of the location of this site may at least explain the apparent absence of ricing jigs. Unlike Archaic AK 11, which probably overlooked open water to the east, later prehistoric AK 11 was located well inland from the lake and wild

rice beds may well have been located some distance away. Although this would not necessarily preclude the use of wild rice at the site, it is likely that the processing of the rice took place closer to the place of harvest. The main activities at AK 11 may have been focused on more immediate, riverine resources, including, possibly, excellent spring and summer fishing. Historic records of Ojibwa fishing methods suggest the seasonal use of fish dams and weirs in small and medium sized streams (Birk 1986:95). It seems highly likely that similar techniques were used during prehistoric times. As bone preservation appears to have been very good at AK 11, a Phase III investigation making consistent use of water-screening may well provide some excellent data regarding fishing and other hypothesized subsistence activities.

6. The AK 11 evidence also includes some plant remains which, unfortunately, proved too fragmented for species identification. Future investigations would hopefully recover more and better preserved botanical remains and enhance the possibilities of paleobotanical reconstruction. A fairly high ratio of grindstones in some site areas may indicate the importance of seeds, nuts and other plant remains in the diet. An improved data base would confirm this assumption and provide more specific evidence about the types of plant foods used.
7. In addition to the above, there are several more specific points that need clarification, e.g. the nature of the three depressions in Areas B and D as well as the origin of the buried cobble layers found in both FT1 (in Area A) and one of the depressions in Area B. Some other structures or structural remains also need more detailed documentation, e.g. the dam tender's residence which appears to contain at least part of the old Libby Post Office, and the foundation of the old school north of the dam.

Eligibility for the National Register of Historic Places; Site Boundaries

Considering the comparatively high degree of site preservation, as well as the above-mentioned local and regional significance of some of the data at 21 AK 11, there seems to be little doubt that the site would be eligible for the National Register. Consequently, future management of this Corps property would have to plan and

implement measures for the protection of the cultural deposits.

Figure 9 gives a graphic description of the site boundaries, as determined on the basis of the 1975-1985 investigations as well as topographic consideration.

Area A (Figures 9 and 10) is surrounded by extensive marshes to the north, east and south; on the west side, it is separated by the river from Areas B and C. Historic site use extended as far north as the beginning of the built up road bed across the marsh (Figure 4). Prehistoric site use has been documented on all reasonably high and level parts of the ridge. On the northeastern lobe, prehistoric evidence extends almost to the edge of the marsh. On the southeastern lobe, testing stopped as the evidence began to peter out towards the beginning of the narrow, wooded easternmost 60 m stretch of the crest. Whether any physical evidence remains there or not, however, it seems inconceivable that even this narrow part should not have been used at least as a trail in prehistoric and early historic times. The entire ridge is therefore considered as a part of the site.

Area B is also delineated mostly by natural, topographic boundaries: the Sandy River to the north, the lake basin to the east and south. The west edge, however, is considered to be separated from Area C by the access road to the dam.

Area C extends across the higher ground west of Area B and it is bounded by the river along the north and southwest sides. The terrace that lies within the first meander of the river and west/northwest of the administrative complex, has been formed by relatively recent shifting of the river channel. It is also quite low, only a few feet higher than normal river level, and seems quite unsuitable for human occupation or more than very intermittent use. The southern part of the site--southern Area C and all of Area D--occupies fairly low and level ground bounded by the lake to the east, by the river and a low, wooded area to the west. The wooded area was tested with negative results. At the southern end, high ground tapers to a narrow ridge that seems totally altered by the building of the raised roadbed.

Interpretive Potential

The Sandy Lake Recreation Area appears to be quite intensively used during the summer season. Located close to State Highway 65, it is also very accessible to the general public. Considering the above, as well as the rich and varied evidence on 21 AK 11 and the unusually complete representation of the cultural sequence, the site seems very well suited for public interpretation.

A small visitors center is already in existence and contains an artifact display contributed by the Zink family of Osceola, Wisconsin. Their collection appears to contain material from several Big Sandy Lake sites, not just AK 11, and it is quite informative. Augmented with another exhibit focused entirely on AK 11, and updated with more current information about the regional paleoenvironment and cultural sequence as well as some state-of-the-art graphic and photographic displays, the visitors center could be upgraded into a first rate facility on a fairly modest budget. With administrative staff constantly present at the dam, the site would be well-supervised and protected from any negative repercussions of public awareness of its existence.

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1964 Map M43-P-77/2 (April 1)
1973 Map M43-R-3/4 (Dec.)
1985 Map M43-P-3/31 (March)

Appendix A: Scope

SCOPE OF WORK
CULTURAL RESOURCES INVESTIGATION
OF SITE 21AK11, AITKIN COUNTY, MINNESOTA
AT SANDY LAKE RECREATION AREA, BIG SANDY LAKE

1.00 INTRODUCTION

1.01 The Contractor will undertake a cultural resources investigation of site 21AK11 in order to determine the significance of the site to the National Register of Historic Places.

1.02 This cultural resources inventory partially fulfills the obligations of the Corps of Engineers (Corps) regarding cultural resources, as set forth in the National Historic Preservation Act of 1966 (Public Law (PL) 89-665), as amended; the National Environmental Policy Act of 1969 (PL 91-190); Executive order (EO) 11593 for the "Protection and Enhancement of the Cultural Environment" (Federal Register, 13 May 1971); the Archeological and Historical Preservation Act of 1974 (PL 93-291); the Advisory Council on Historic Preservation "Regulations for the Protection of Historic and Cultural Properties" (36 CFR Part 800); the Department of the Interior guidelines concerning cultural resources (36 CFR Part 60); and the applicable Corps regulations (ER 1105-2-50).

1.03 The laws listed above establish the importance of Federal leadership, through the various responsible agencies, in locating and preserving cultural resources within project areas. Specific steps to comply with these laws, particularly as directed in PL 93-291 and EO 11593, are being taken by the Corps "... to assure that Federal plans and programs contribute to the preservation and enhancement of non-Federally owned sites, structures, and objects of historical, architectural, or archeological significance." A part of that responsibility is to locate, inventory, and nominate to the Secretary of the Interior all such sites in the project area that appear to qualify for listing on the National Register of Historic Places.

1.04 EO 11593 and the 1980 amendments to the National Historic Preservation Act further direct Federal agencies "... to assure that any Federally owned property that might qualify for nomination is not inadvertently transferred, sold, demolished or substantially altered." In addition, the Corps is directed to administer its policies, plans, and programs so that Federally and non-Federally owned sites, structures, and objects of historical, architectural, or archeological significance are preserved and maintained for the inspiration and benefit of the people.

1.05 This cultural resources investigation will serve several functions. The report will be a planning tool to aid the Corps in meeting its obligations to preserve and protect our cultural heritage. It will be a comprehensive, scholarly document that not only fulfills Federally mandated legal requirements but also serves as a scientific reference for future professional studies. It will identify sites that may require additional investigations and that may have potential for public-use development. Thus, the report must be analytical in nature, not just descriptive.

2.00 PROJECT DESCRIPTION

2.01 Big Sandy Lake is located approximately 110 miles north of the Twin Cities (Map 1) in Aitkin County, Minnesota. The Sandy Lake recreation area is at the outlet of Big Sandy Lake, along the north shore (Map 2). The Sandy River empties into the Mississippi River a short distance from Big Sandy Lake.

2.02 The proposed project within the Sandy Lake recreation area consists of parking lot and boat ramp construction and the construction of a swimming beach.

2.03 The new parking lot and boat ramp is on the south side of the Sandy River at the entrance to the recreation area (Map 3). The existing access road would be relocated to its former (pre-1951) position to the west. The majority of the parking lot would then be constructed between the present road and the former road. A portion of the parking lot, boat ramp, and turn-around area would be constructed between the existing access road and the lake.

2.04 The proposed swimming beach area would be located in the area of the present boat landing. This landing will be removed and a sand blanker would be placed from the waters edge to 15 to 45 feet inland.

2.05 Map 4 shows the disturbance which has taken place at the recreation area since the time that the old townsite of Libby, Minnesota was located adjacent to the dam in the 1890's.

3.00 DESCRIPTION OF PREVIOUS CULTURAL RESOURCES STUDIES

3.01 Site 21AK11 is located within the Sandy Lake recreation area which is operated by the U.S. Army Corps of Engineers, St. Paul District as part of the Mississippi River Headwater Reservoirs project.

3.02 The site was first reported by Upham (in Winchell, 1899, pp. 53-54) as containing "numerous arrow and lance points of stone, and several of copper besides curved bands of copper..." He reported that these were found by the postmaster for Libby, Minnesota, a town site which used to be located within the recreation area. A 9-inch copper projectile point was also found in the late 1800's during excavation for the dam.

3.03 In 1975, the University of Minnesota conducted test excavations in the recreation area in conjunction with construction of a comfort station. Material recovered included projectile points, debitage, cord marked pottery, and faunal material. Test unit 1 was placed approximately 100 feet from the proposed beach area.

3.04 During 1977 a shoreline cultural resources survey was conducted by the Science Museum of Minnesota at Big Sandy Lake. This survey encompassed not only the shoreline of Big Sandy Lake but also all Corps of Engineers' property which included site 21AK11 (Map 4). A total of 14 formal and informal test units were excavated within the recreation area. Nearly all test units produced cultural

materials, including late Prehistoric Blackduck ceramics, lithic material, and bone fragments.

3.05 Five test units were placed within the proposed parking lot and boat ramp area. All contained prehistoric materials except test unit 4. Test units 1-3 were shown to be adjacent to the access road. It is possible that this material may have been redeposited in the road fill which came from an area north of the dam. A description of the nature of the deposits was not included within the report, and the depth of the test units was only 30-50 cm. No test units were placed in the vicinity of the swimming beach.

4.00 DEFINITIONS

4.01 Cultural Resources are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archeology, or culture of an area.

4.02 Phase I Cultural Resources Survey is defined as an intensive, on-the-ground survey and testing of an area sufficient to determine the number and extent of the resources present and their relationship to project features. A Phase I cultural resources survey will result in data adequate to assess the general nature of the sites present; a recommendation for additional testing of those resources which, in the professional opinion of the Contractor, may provide important cultural and scientific information; and detailed time and cost estimates for Phase II testing.

4.03 Phase II Testing is defined as the intensive testing of those sites that may provide important cultural and scientific information. Phase II testing will result in data adequate to determine the eligibility of the resources for inclusion on the National Register of Historic Places, a plan for the satisfactory mitigation of eligible sites that will be directly or indirectly impacted, and detailed time and cost estimates for mitigation.

5.00 SURVEY AND TESTING SPECIFICATIONS

5.01 Phase II testing will be conducted at site 21AK11 in accordance with Section 4.04 above.

5.02 Testing will be conducted in the area of the proposed swimming beach from the shoreline to a point 50 feet inland and in the area of the proposed parking ramp and boat landing. Testing of the proposed parking ramp and boat landing will be conducted between the former location of the access road (pre-1951) and the lake and from a point 100 feet north of the northernmost part of the parking lot to a point 100 feet south of the southernmost part of the boat landing.

5.03 The Contractor will use a systematic, interdisciplinary approach in conducting the study. The Contractor will provide specialized knowledge and skills during the course of the study to include expertise in archeology and in other social and natural sciences as required. It is recommended that a geomorphologist or soil scientist be present at times during the testing of site 21AK11 to interpret the depositional nature of the cultural deposits.

5.04 The extent and character of the work to be conducted by the Contractor will be subject to the general supervision, direction, control, review, and approval of the Contracting Officer.

5.05 Techniques and methodologies that the Contractor uses during the investigation shall be representative of the current state of knowledge for their respective disciplines.

5.06 The Contractor must keep standard records that shall include, but not be limited to, field notebooks, site survey forms, field maps, and photographs.

5.07 The recommended professional treatment of recovered materials is curation and storage of the artifacts at an institution that can properly insure their preservation and that will make them available for research and public view. The Contractor will be responsible for making curatorial arrangements for any collections that are obtained. Such arrangements must be coordinated with the appropriate officials of Minnesota and approved by the Contracting Officer.

5.08 The Contractor shall provide all materials and equipment as may be necessary to expeditiously perform those services required of the study.

5.09 The Contractor will test the site areas sufficiently to determine the existence of cultural materials and/or features, their condition (in situ or disturbed), the horizontal and vertical distribution of the remains, and, if possible, the cultural affiliation of the site(s).

5.10 Recommendations on the significance of the site(s) according to the National Register of Historic Places criteria will be included in the Contractor's report. These recommendations will include a detailed justification for the significance or non-significance of the site(s), including what research questions the site(s) can answer.

5.11 The on-the-ground examination will involve an intensive survey and shovel testing of the area to determine the number and extent of cultural resources present. This includes standing structures as well as historical and prehistorical archeological sites.

5.12 The Contractor's survey will include surface inspection in areas where surface visibility permits adequate recovery of cultural materials and subsurface testing in all areas where surface visibility is limited or obscured. Subsurface investigation will include shovel testing, coring, soil borings, cut bank profiling or some other appropriate testing method. If field methods vary from those required, they must be described and justified in the report.

5.13 The required transect interval for testing is 15 meters (50 feet). However, this interval may vary depending upon field or site density/size conditions. If the recommended interval is not used, written justification should be presented in the technical report for selection of an alternate interval. All subsurface tests will be screened through 1/4-inch mesh hardware cloth and will be recorded on appropriate testing forms. All

subsurface testing forms will be included in the appendix to the Contractor's report. The Contractor will also indicate the locations of all subsurface tests on USGS and/or project maps and key these with the testing forms in the appendix.

5.14 The Contractor will recommend appropriate mitigative measures, including time and cost estimates, where warranted.

5.15 All testing will employ standard archeological techniques, including formal test pits. All material will be screened through 1/4-inch mesh screen.

5.16 The tested areas will be returned as closely as practical to pre-survey conditions by the Contractor.

6.00 GENERAL REPORT REQUIREMENTS

6.01 The Contractor will submit the following types of reports, which are described in this section and in section 9.00: field report, field notes, draft contract report, and a final contract report, and a completed National Register form(s), if appropriate.

6.02 The Contractor's technical report will include, but will not be limited to, the following sections, as appropriate to the study.

a. Title page: The title page will provide the following information: the type of investigation undertaken; the cultural resources that were assessed (archeological, historical, and architectural); the project name and location (county and State); the date of the report; the Contractor's name; the contract number; the name of the author(s) and/or Principal Investigator; the signature of the Principal Investigator; and the agency for which the report is being prepared.

b. Management summary: This section will include a concise summary of the study, which will contain all essential data for using the document in the Corps of Engineers management of the project. This information will minimally include: the budget, why the work was completed, summary of the study (field work; lab analysis), study limitations, study results, significance, recommendations, and the repository of all pertinent records and artifacts.

c. Table of contents

d. List of figures

e. List of plates

f. Introduction: This section will identify the sponsor (Corps of Engineers) and the sponsor's reason for the study; and an overview of the cultural resource project, with the site(s) located on USGS quad maps. This section will also define the location and boundaries of the study areas (with regional and area-specific maps); define the study area within its cultural, regional, and environmental context; reference the scope of work; identify the institution that did the work, the number of people involved in the study, and

the number of person-days/hours spent on the study; identify the dates when the various types of work were completed; identify the repository of records and artifacts; and provide a brief overview or outline of how the study report will proceed and an overview of the major goals that the study and report will accomplish.

g. Previous archeological and historical studies: This section will provide a brief summary and evaluation of previous archeological and historical studies of the study area including the researchers, date, extent, adequacy of the past work, study results, and cultural/behavioral inferences derived from the research.

h. Environmental background: This section will include a brief description of the study area environment, including the following categories: geology, vegetation, fauna, climate, topography, physiography, and soils, with reference to prehistoric, historic, ethnographic, and contemporary periods. Any information available on the relationship of the environmental setting to the area's prehistory and history will also be included. This section will be of a length commensurate with other report sections.

i. Theoretical and methodological overview: This section will include a description or statement of the goals of the Corps of Engineers and the study researcher, the theoretical and methodological orientation of the study, and the research strategies that were applied in achieving the stated goals.

j. Field methods: This section will describe the specific archeological activities undertaken to achieve the stated theoretical and methodological goals. The section will include all field methods, techniques, strategies, and rationale or justification for specific methods or decisions. The description of the field methods will minimally include: a description of field conditions, topographic/physiographic features, vegetation conditions, soil types, stratigraphy, testing results with all appropriate testing forms to be included as an appendix, and the rationale for eliminating uninvestigated areas. Testing methods will include descriptions of test units (size, intervals, stratigraphy, depth) and the rationale behind their placement.

k. Laboratory methods: This section should explain in detail the laboratory methods employed and the rationale behind the method selected. This section should also contain references to accession numbers used for all collections, photographs and field notes obtained during the study, and the location where they are permanently housed.

l. Analysis: This section will describe and provide the rationale for the specific analytic methods and techniques used, and describe and discuss the qualitative and quantitative manipulation of the data. Limitations or problems with the analysis based on the data collection results will also be discussed.

m. Investigation results: This section will describe all of the archeological resources encountered during the study, and other data pertinent to a complete understanding of the resources within the study area. The

description of the data will minimally include: a description of the site; amounts and type of material remains recovered; relation of the site or sites to physiographic features, vegetation and soil types; direct and indirect impacts to the site(s); analysis of the site and data (e.g., site type, cultural historical components and information, cultural/behavioral inferences or patterns); site condition; and location and size information (elevation, complete quad map source, legal description, address if appropriate, and site size, density, depth, and extent).

n. Evaluation and conclusions: This section will evaluate and formulate conclusions concerning location of the site(s); size, condition, distribution, and density in relation to other sites in the area; and significance in relation to the local and regional prehistory, protohistory, and history. This section will also discuss the potential and goals for future research; describe the reliability of the analysis; relate results of the study and analysis to the stated study goals; identify changes, if any, in the research goals; synthesize and compare the results of the analysis and study; integrate ancillary data; and identify and discuss cultural/behavioral patterns and processes that are inferred from the study and analysis results.

o. Recommendations: This section will discuss the significance of the site(s) in relation to the research goals of the study and the National Register of Historic Places criteria; make potential recommendations as to the eligibility of the site(s) to the National Register; and make suggestions with regard to the Corps of Engineers management goals. These recommendations will include a time and cost estimate for mitigation, if necessary. If it is the Contractor's preliminary assessment that the site(s) is (are) or is (are) not significant, the methods of investigation and reasoning which support that conclusion will be presented. Any evidence of cultural resources or materials which have been previously disturbed or destroyed will be presented and explained. If certain areas are not accessible, recommendations will be made for future consideration.

p. References: This section will provide standard bibliographic references (American Antiquity format) for every publication cited in the report. References not cited in the report will be listed in a separate "Additional References" section.

q. Appendix: This section will include the Scope of Work, resumes of all personnel involved, all correspondence derived from the study, all State site forms, and all testing and any other pertinent report information referenced in the text as being included in the appendix.

6.03 The location of all sites and other features discussed in the text will be shown on a legibly photocopied USGS map and will be bound into the report. All maps will be labeled with a caption/description, a north arrow, a scale bar, township, range, map size, and dates, and the map source (e.g., the USGS quad name or published source) and will have proper margins.

6.04 All sites identified in the course of the study, including find spots and known sites, will be presented on State site forms as an appendix to the report. Data should also be provided about the present condition of the sites

(disturbance by natural or manmade processes) and content of any collections from the sites. Known sites all have their State site forms updated as necessary. All State site forms will be submitted to the State Archeologist.

6.05 Failure to fulfill these report requirements will result in the rejection of the Contractor's report by the Contracting Officer.

7.00 FORMAT SPECIFICATIONS

7.01 The Contractor shall submit to the Contracting Officer the photographic negatives for all black and white photographs that appear in the final report.

7.02 All text materials will be typed, single-spaced (the draft reports should be space-and-one-half or double-spaced), on good quality bond paper, 8.5 inches by 11.0 inches with 1.5-inch binding and bottom margins and 1-inch margins on the top and other margin, and will be printed on both sides of the paper.

7.03 Information will be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective, or advantageous to communicate the necessary information.

7.04 All figures and maps must be clear, legible, self-explanatory, and of sufficiently high quality to be readily reproducible by standard xerographic equipment, and will have margins as defined above.

7.05 The final report cover letter shall include a budget of the project.

7.06 The draft and final reports will be divided into easily discernible chapters, with appropriate page separation and heading.

8.00 MATERIALS PROVIDED

8.01 The Contracting Officer will furnish the Contractor with the following materials: access to any publications, records, maps, or photographs that are on file at the District headquarters.

9.00 SUBMITTALS

9.01 The Contractor will submit reports according to the following schedules:

a. Field report: The original and one copy of the field report will be submitted within two weeks of completion of the field testing. All archeological field testing will be completed on or before June 14, 1985. The field report will summarize the work, project/field limitations, methodology used, time used, and survey results.

b. Project field notes: One legible copy of all the project field notes will be submitted with the draft contract report.

c. Draft contract report: Seven (7) copies of the draft contract report will be submitted on or before August 1, 1985. The draft contract report

will be reviewed by the Corps of Engineers, the State Historical Preservation Officer, the State Archeologist, and the National Park Service. The draft contract report will be submitted according to the report and contract specifications outlined in this scope of work.

d. Final contract report: The original and 15 copies of the final contract report will be submitted 60 days after the Corps of Engineers comments on the draft contract report are received by the Contractor. The final contract report will incorporate all the comments made on the draft contract report.

9.02 Neither the Contractor nor his representative shall release any sketch, photograph, report, or other materials of any nature obtained or prepared under the contract without specific written approval of the Contracting Officer prior to the acceptance of the final report by the Government. After the Contracting Officer has accepted the final report, distribution will not be restricted by either party except that data relating to the specific location of extant sites will be deleted in distribution to the public.

9.03 All materials, documents, collections, notes, forms, maps, etc., which have been produced, gathered, or acquired in any manner for use in the completion of this contract shall be made available to the Contracting Officer upon request.

10.00 METHOD OF PAYMENT

10.01 Requests for partial payment under this fixed price contract shall be made monthly on ENG Form 93. A 10-percent retained percentage will be withheld from each partial payment. Upon approval of the final reports by the Contracting Officer, final payment, including previously retained percentage, shall be made.

Appendix B: Test Records

Crew S Thurston, J Myster

Date 8/1/85

TEST UNIT: 21

TEST UNIT: 22

SOIL PROFILE

CULTURAL MATERIAL

Black, organic
fine to sandy
1 cm

Very dark
yellowish
brown
Sandy loam
w gravel

↓
becoming
more
sandy
w depth

11/11/77

Dense Concentration of:

- 1 bottle neck
- 6 glass fragments (3 burnt)
- 2 pieces of burnt bone
- 2 " " unburnt "
- 1 piece of mortar
- 2 nails (one sq. sh., one round)
- 2 slabs (one frag. mortar, 1 with vapor)

tertiary chert flake

100 cm.

SOIL PROFILE

CULTURAL MATERIAL

Dark brown
very gravelly
+ sandy
fill

Orig. A. h. orig.
bleue orgen
fri-wic
sandy 100m

very dark
yellowish
brown
Sandy
clay loam

77,000

- 3 bottle glass fragments
- 1 window "
- 3 thin (wine?) glass "
- 103 burnt glass "
- 6 rusted metal/nail fragments (4 prob
hand forged)
- 1 China fragment
- 203 bone fragments

Small fragments,
of bottle/window glass.

100 cm.

TEST UNIT: 23

TEST UNIT: 24

SOIL PROFILE

CULTURAL MATERIAL

black
orange
fucile
Sandy loam

very dark
yellowish
brown
Sandy loam

Same as
above but
with more
gravel
////////

10 ← slayed and decorated chine sherd

20
← 1 piece of chalcodary shatter

100 cm.

SOIL PROFILE

CULTURAL MATERIAL

black organic
friable
Sandy loam

Some also
close with
admixture
of gray ash

very dark
yellowish
brown sandy
loam w
ash mottling
dark gray
silty clay
loam

55555555

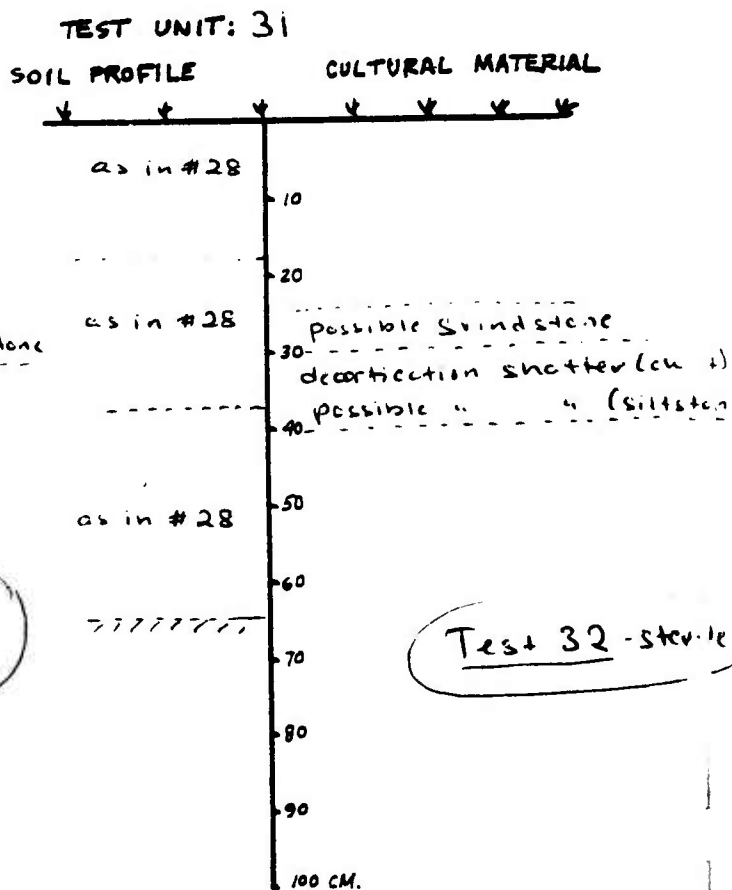
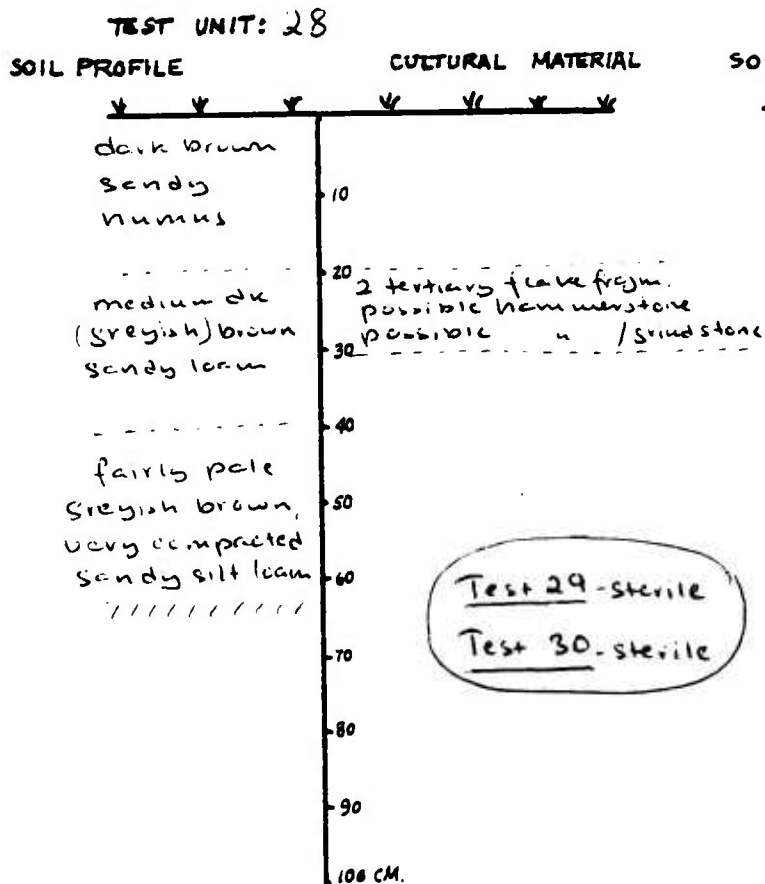
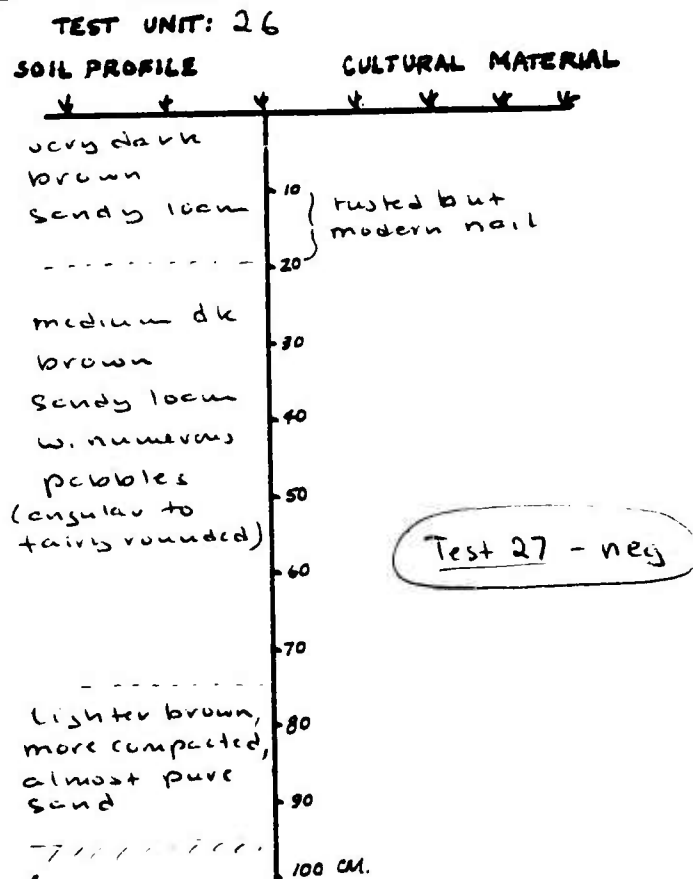
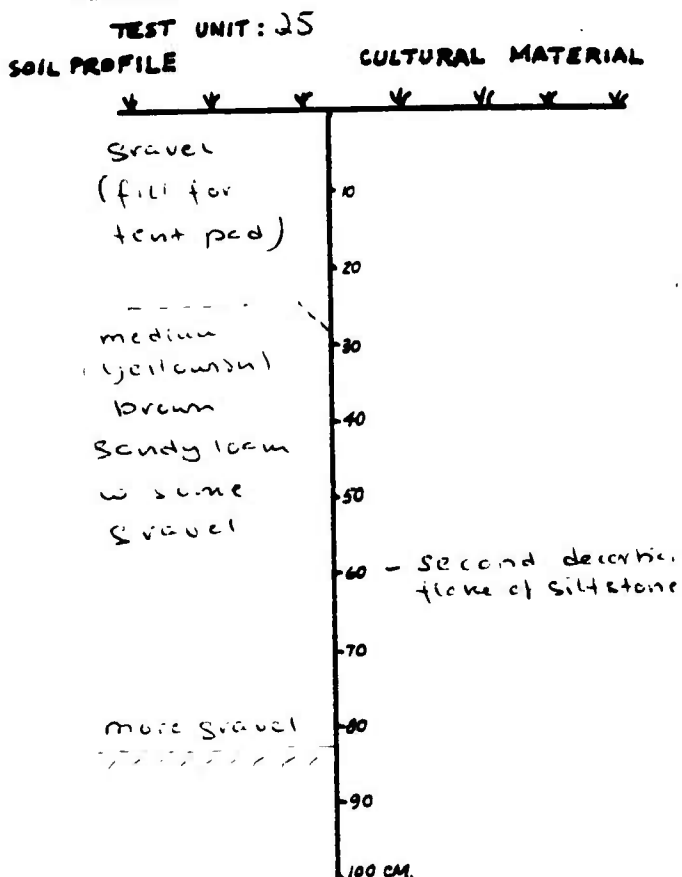
Dense concentration of:

- 4 bottle frags (square/rect c/s)
- 10 6 thinner bottle/glass fragments,
- 2 pressed glass fragments,
- 2 (wine?) glass "
- 20 3 sized chine "
- 1 railroad spike
- 3 nails (unburnt?)
- 30 rusted can(s) -- ~~the~~ fragments,
- 9 unburnt bone fragments

100 CM.

Crew Harrison

Date 8-2-85



Date 8-2-85

TEST UNIT: 34 (C.H)

CULTURAL MATERIAL

2 tert. flocks (chest)
decor. gutter (u)
poss pushing stone
FMR fragment
mammary bone fragments

8.4. body shed
 Second decort. fi (chert)
 10. tert. + 1 chert (chert) -
 3 tertiary chert plates
 For fragment

fractured scraper

100 cm.

100 cm.

TEST UNIT: 39 (C.H.)

CULTURAL MATERIAL

40 - text flock (1000+ termin)
shearer (milky quartz)

Lighter
brown
coarse
sand

Test 36 - sterile

Test 37 - sterile

Test 38 - sterile

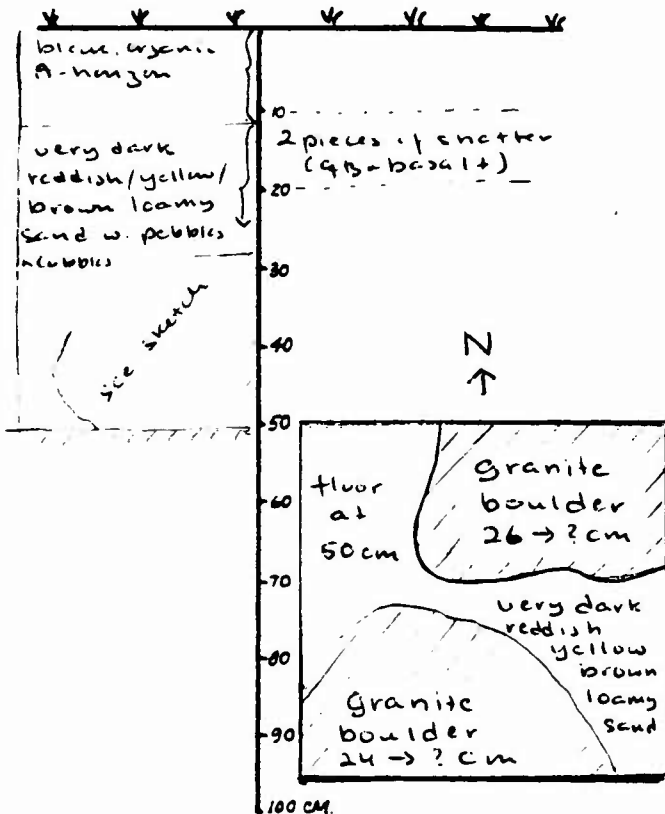
100 CM.

100 CM.

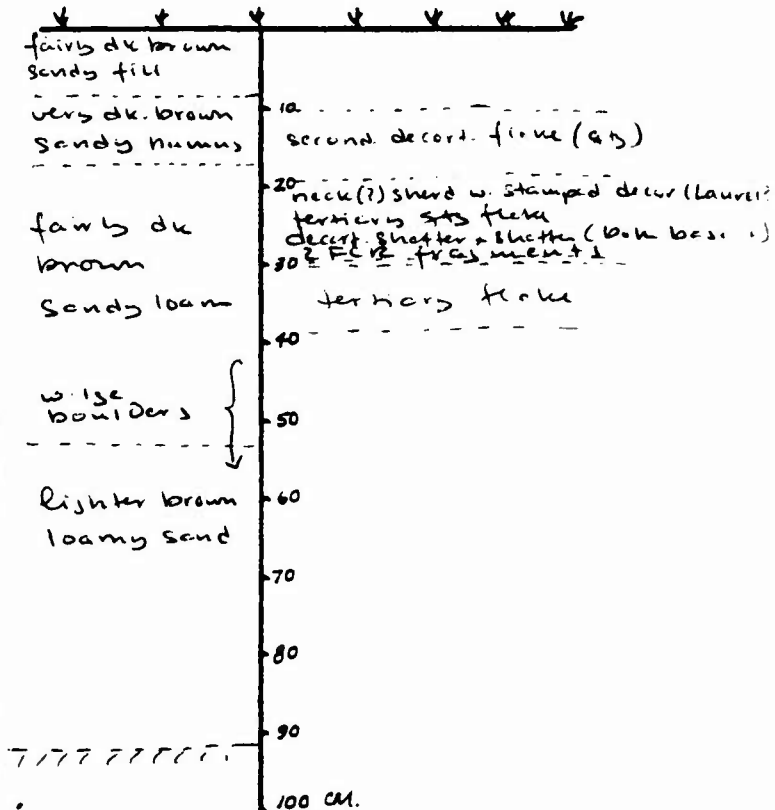
Crew Harrison / Myster / Thurston

Date 8-23-85

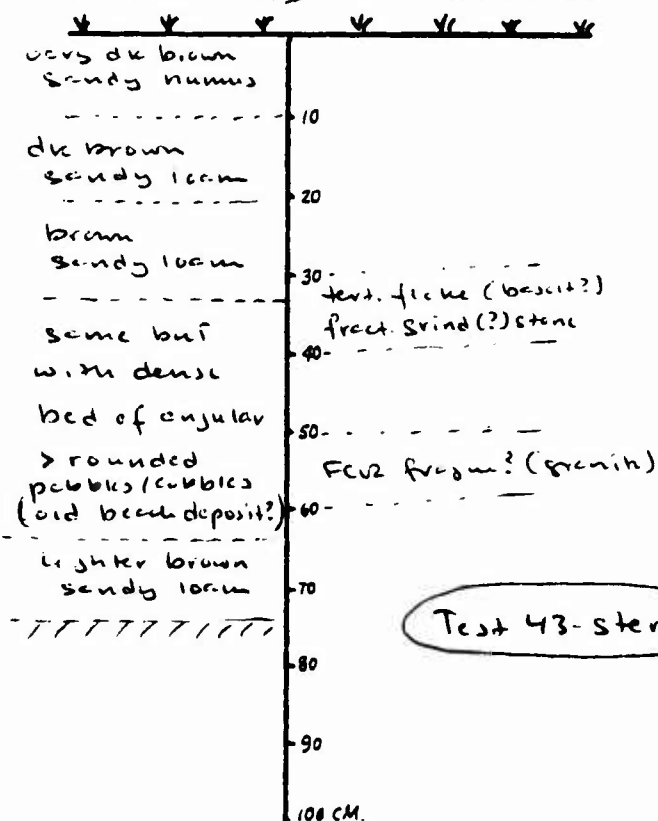
TEST UNIT: 40 (M+Th)
 SOIL PROFILE 8/2 CULTURAL MATERIAL



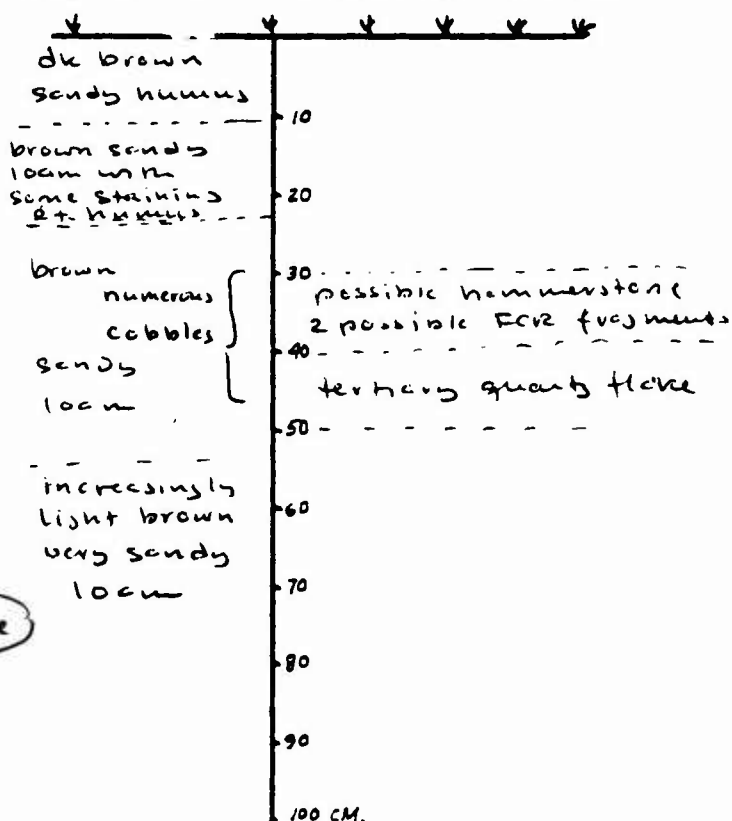
TEST UNIT: 41 (C.H.)
 SOIL PROFILE 8/2 CULTURAL MATERIAL



TEST UNIT: 42 (M+Th)
 SOIL PROFILE 8/3 CULTURAL MATERIAL



TEST UNIT: 44 (C.H.)
 SOIL PROFILE 8/3 CULTURAL MATERIAL



Test 43-sterile

Crew Harrison, Myler, Thurston

Date 8/3-5/85

TEST UNIT: 8/3 (SW 1/4) & 8/5 (NE 1/4)
SOIL PROFILE (FT 1) CULTURAL MATERIAL

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

See attached
Sketch map

historic glass
2 tert. fl. fragments (qb)
decorative shatter
10
shatter (qb) w/ SW 1/4
20
tert. fl. (qb) NW 1/4
chipped piece
fin-cracked cobble } SW 1/2
30
decorative shatter (qb) SW 1/2
35
2 tert. flakes (chert, qb) } NW 1/4
40
knife/disk (qtz) }
second decor. fl. (qb) } NE/E 1/4
45
tert. fl. (qb) }
50
fin-cracked cobble } SW 1/2
4 tert. fl. (qb; beak) }
shatter (qb) }
60
70
80
90
100 CM.

TEST UNIT:
SOIL PROFILE CULTURAL MATERIAL

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

10
20
30
40
50
60
70
80
90
100 CM.

TEST UNIT:
SOIL PROFILE CULTURAL MATERIAL

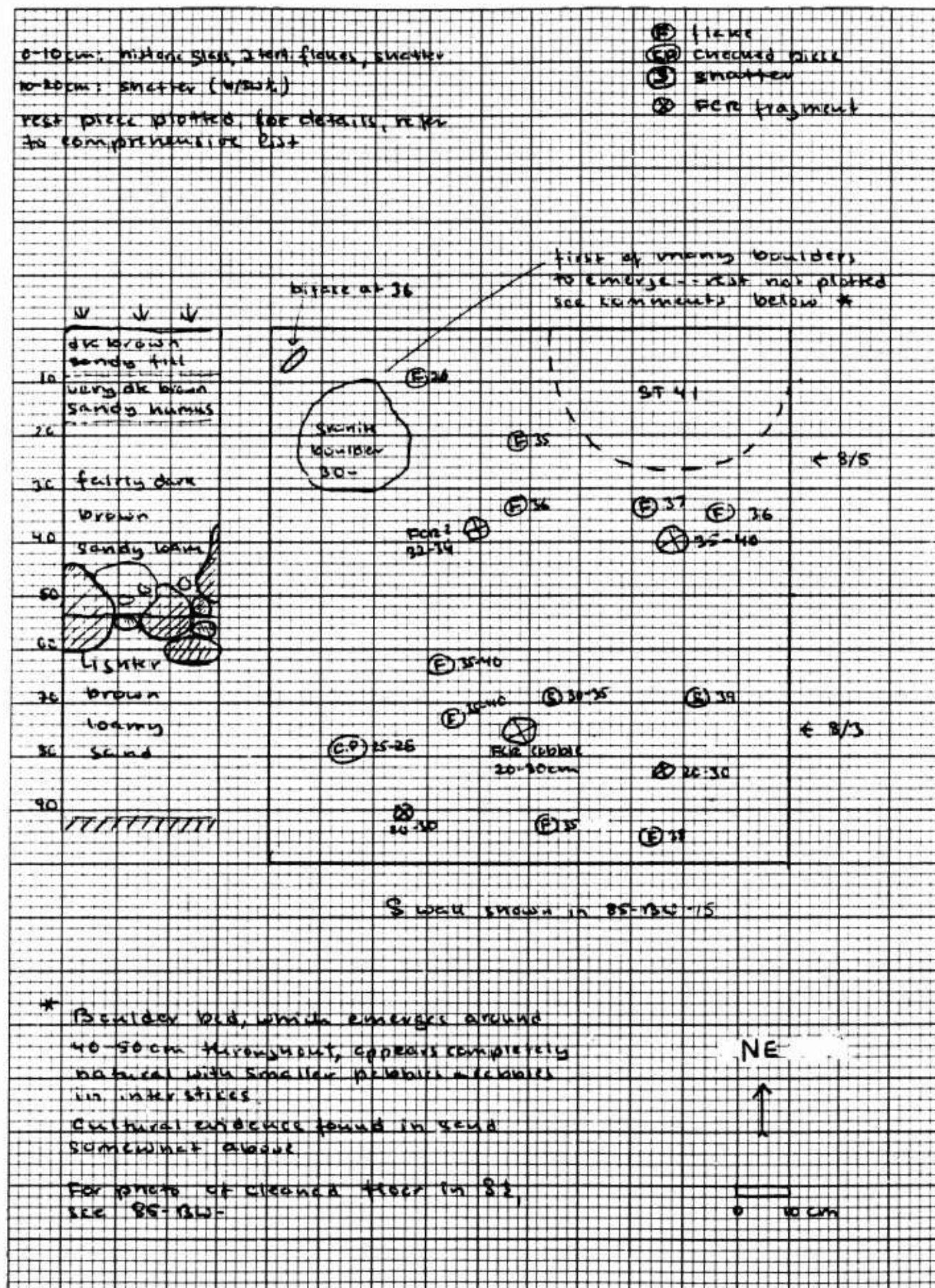
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

10
20
30
40
50
60
70
80
90
100 CM.

TEST UNIT:
SOIL PROFILE CULTURAL MATERIAL

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

10
20
30
40
50
60
70
80
90
100 CM.



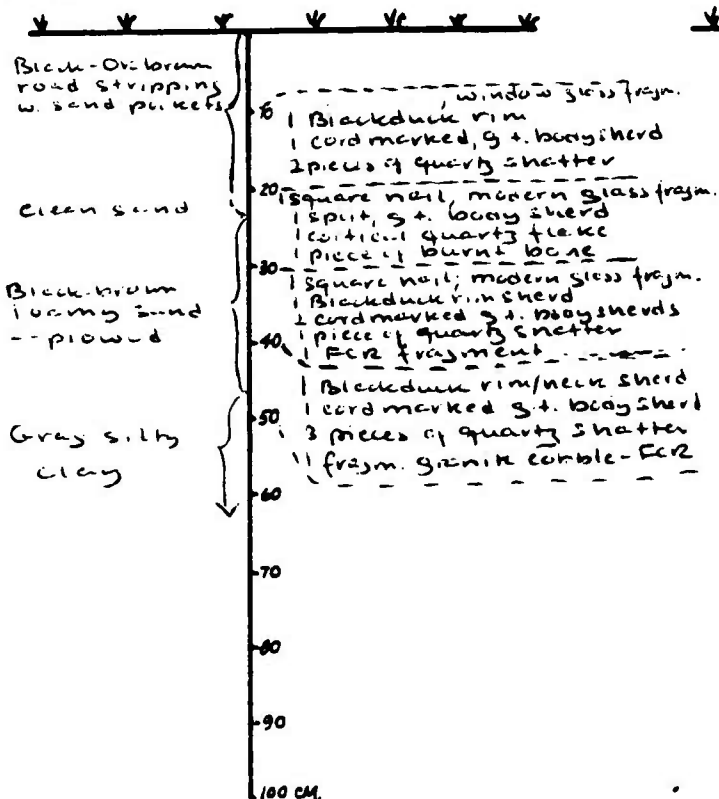
Crew C. Harrison M. Resan

Date 6.10.85

TEST UNIT: #1

SOIL PROFILE

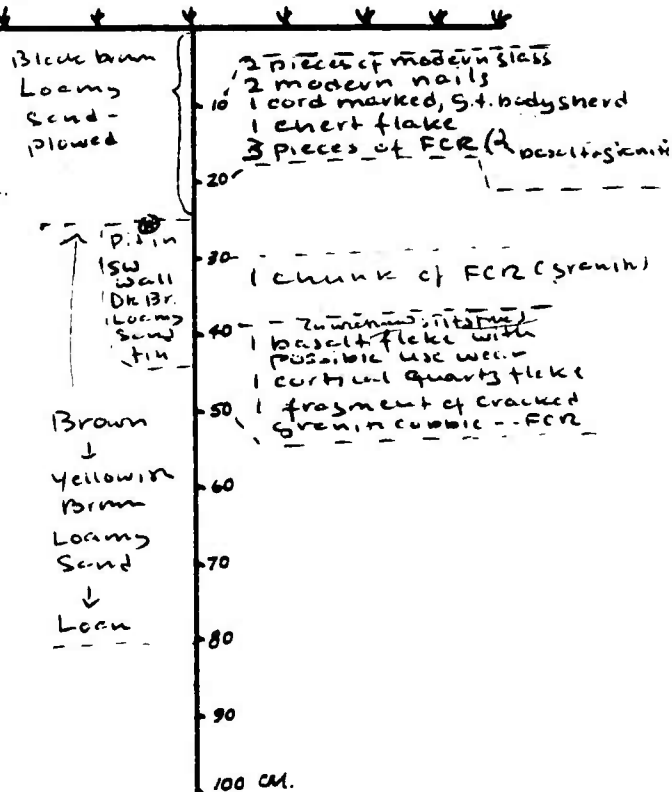
CULTURAL MATERIAL



TEST UNIT: #2

SOIL PROFILE

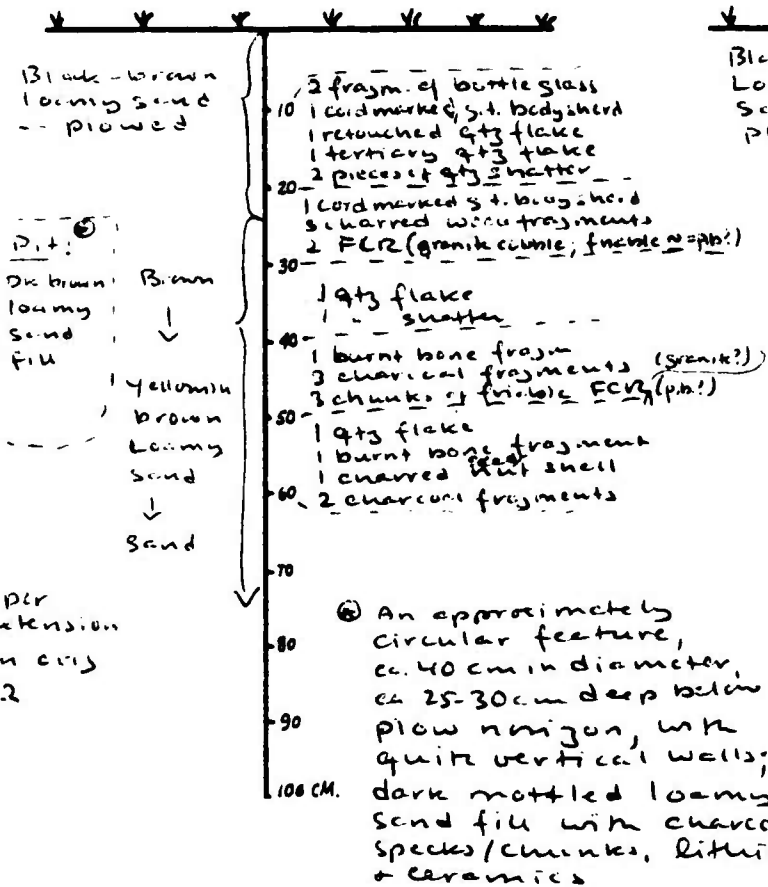
CULTURAL MATERIAL



TEST UNIT: 2 Extension

SOIL PROFILE

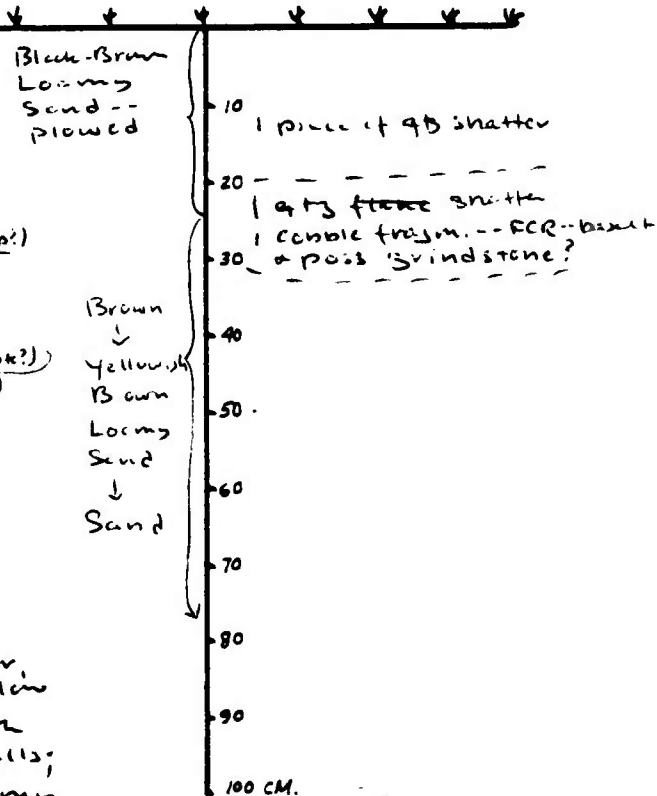
CULTURAL MATERIAL



TEST UNIT: #3

SOIL PROFILE

CULTURAL MATERIAL



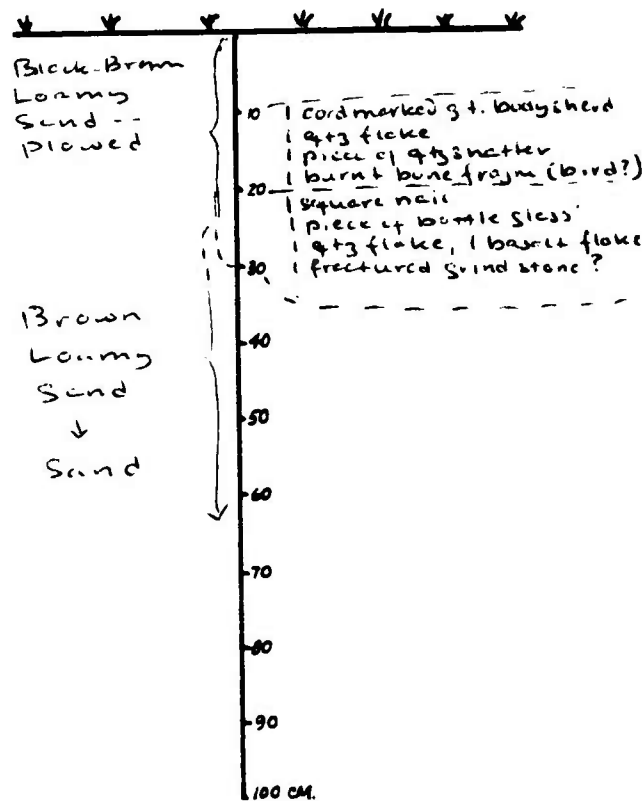
Crew C. Harrison, M. Regan

Date 6.10.85

TEST UNIT: # 4

SOIL PROFILE

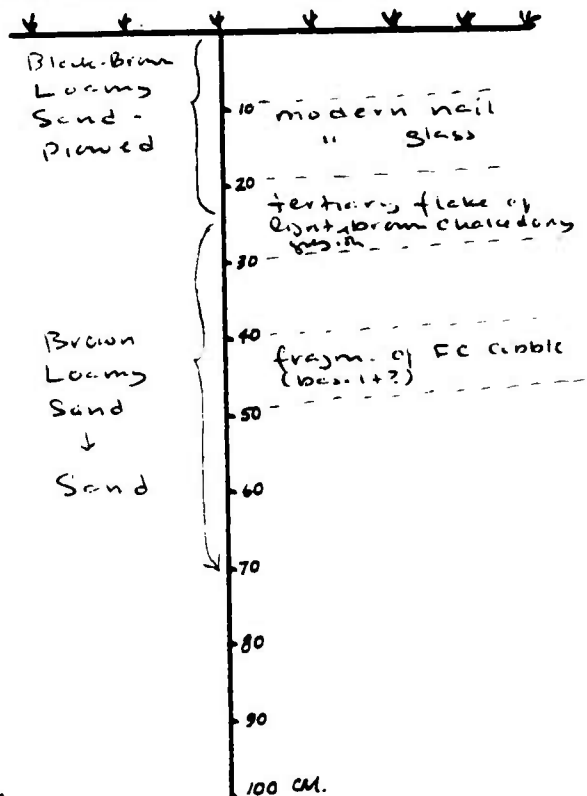
CULTURAL MATERIAL



TEST UNIT: #5

SOIL PROFILE

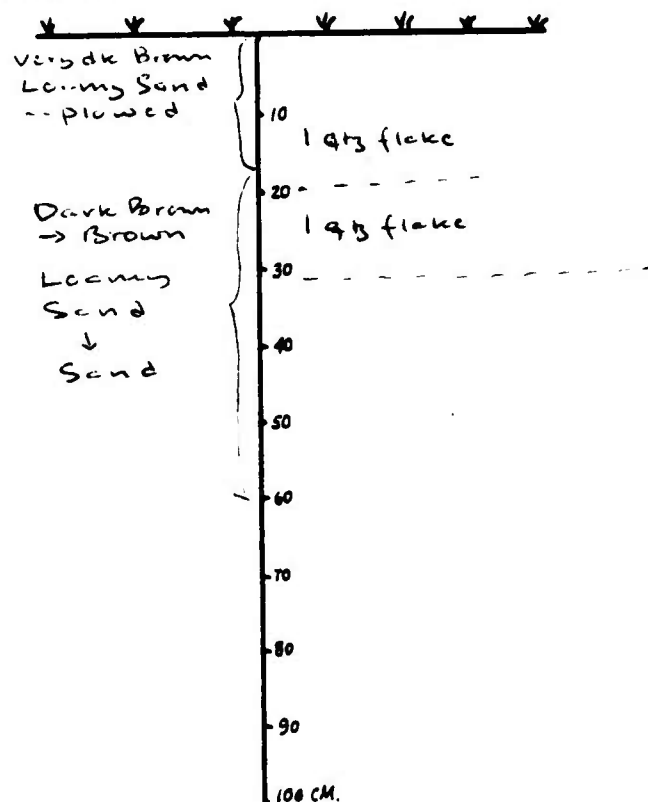
CULTURAL MATERIAL



TEST UNIT: # 6

SOIL PROFILE

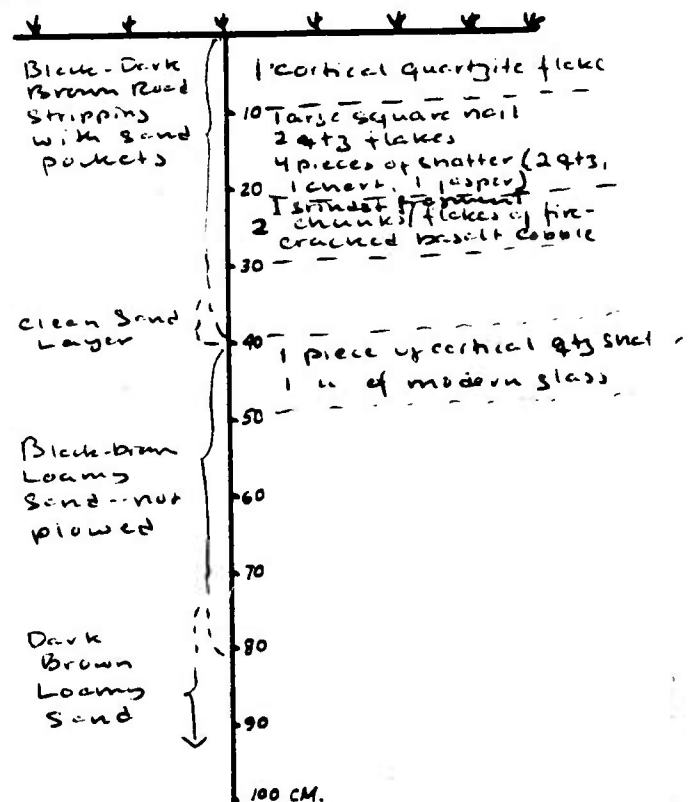
CULTURAL MATERIAL



TEST UNIT: #7

SOIL PROFILE

CULTURAL MATERIAL



Crew Christine Hansen, Marie Resch

Date 6.10-11.85

TEST UNIT: #8

SOIL PROFILE

CULTURAL MATERIAL

Dark Brown
Loamy Sand --
Road Stripping?

Black-Brown
Loamy Sand
-- Plowed

Brown
Loamy Sand
-- Sand

1 modern nail
2 smooth g.t. bodysherds
2 flakes (2 siltstone, 1 qtz)
1 fract. basalt grindstone
20 2 cupole fragm. (Fez-granite?)
30 1 large square nail
1 burnt bone fragm.
2 chunks of fine-cr. basalt
40
50 1 qtz flake
60
70
80
90
100 CM.

TEST UNIT: #9

SOIL PROFILE

CULTURAL MATERIAL

Black-Brown
Loamy Sand
-- Plowed

Brown
Loamy
Sand

Yellowish
Brown
Silty Clay
Loam

1 qtz flake
10 square nail
modern bottle glass
20 8 c.m. g.t. bodysherds
(incl. combed (?) neck sherd?)
30 2 cracked basalt fragm.
40
50
60
70
80
90
100 CM.

TEST UNIT: #10

SOIL PROFILE

CULTURAL MATERIAL

Disturbed
Black Brown
Loamy Sand
w. Black top
chunks --
road stripping

Plowed
Black-Brown
Loamy Sand

Brown
Loamy Sand

Yellowish-
Brown Silty
Clay Loam

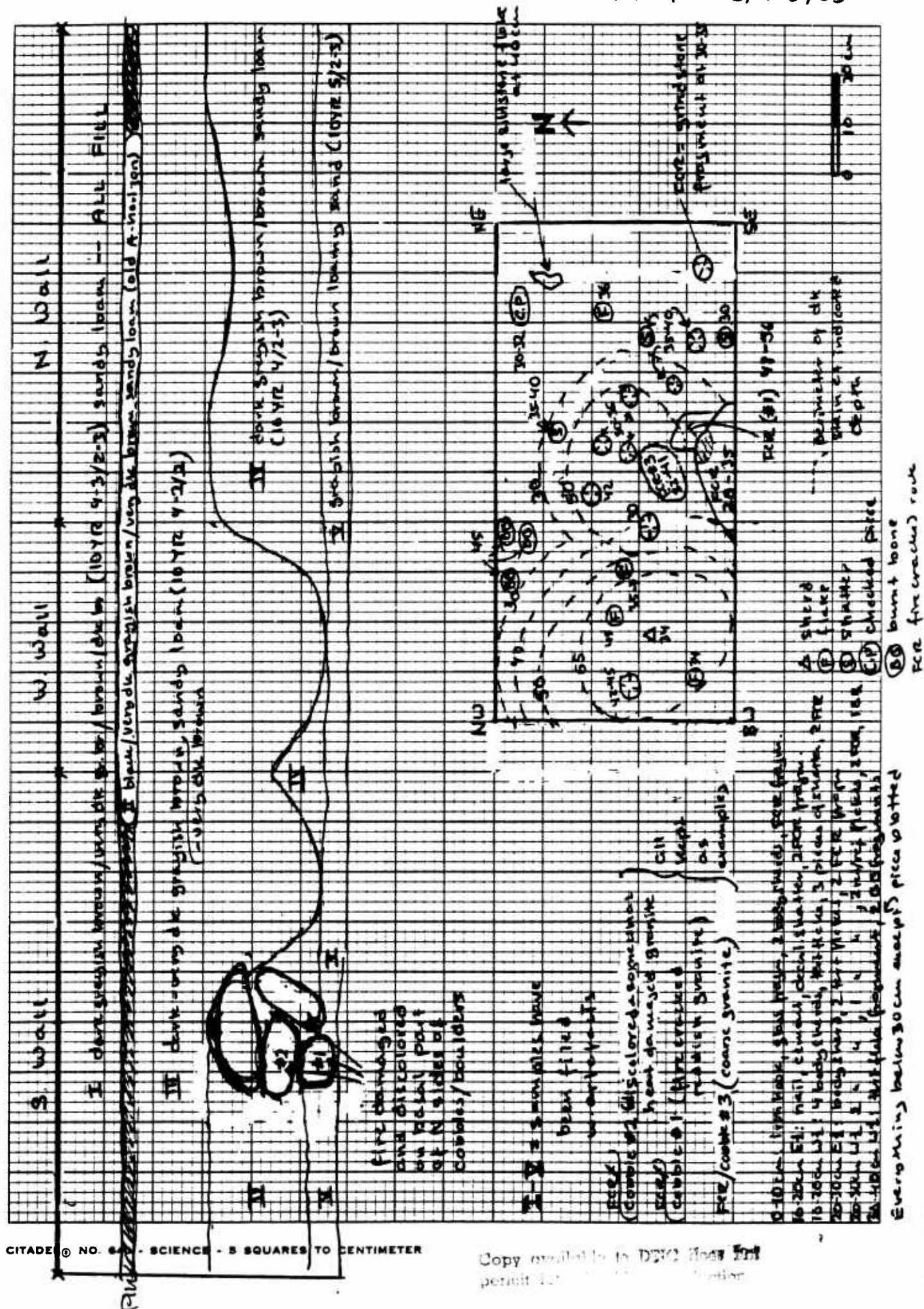
10 1 chunk of black top
knapping stone (basalt)
1 basalt cupole fragm. (Fez)
20 5 chunks of black top
1 7 am, g.t. body sherd.
1 fract. grindstone (?) granite
1 chert basalt chunk
30 1 Fez fragm. (basalt)
1 chunk of black top
40 2 c.m. g.t. body sherds
1 qtz flake
1 1/2 jasper flake
50 3 chunks of black top
1 square nail
1 smooth 5 c.m. g.t. bodysherds
60 2 flakes (chert, siltstone, qtz)
2 pieces of shatter (jasper, qtz)
70
80
90
100 CM.

TEST UNIT: #11

SOIL PROFILE

CULTURAL MATERIAL

10
20
30
40
50
60
70
80
90
100 CM.



Crew C. Harrison J. Muster

Date 8-20-85

TEST UNIT: 47

SOIL PROFILE

CULTURAL MATERIAL

↓ ↓ ↓	↓ ↓ ↓ ↓
dark brown fill	chunks of cement sunburnt, cut bone frag
original top soil	
very dk brown sandy loam (7.5YR 3/2-4/2)	4 chunks of FCR
	small piece of FCR
strong brown (7.5YR 4/6-5/6)	ter. flake fragment
loamy sand w dark mottling	
↓	
gradually lighter, looser & more sandy	
77777777	
100 CM.	

TEST UNIT: 48

SOIL PROFILE

CULTURAL MATERIAL

↓ ↓ ↓	↓ ↓ ↓ ↓
disturbed top soil	FCR fragments piece of cut bone
very dk brown (7.5YR 7/2-4/2)	1 square nail 2 round nails
sandy loam	
strong brown (7.5YR 4/6-5/6)	
loamy sand with dark mottling	tertiary flake
strong brown coarse sand w reddish yellow	
100 CM.	

TEST UNIT: 49

SOIL PROFILE

CULTURAL MATERIAL

↓ ↓ ↓	↓ ↓ ↓ ↓
dk brown sandy loam = fill	3 cracked rocks possibly FCR + one rotten wooden nail -- not kept
partial thin layer of very dk brown	
strong brown loamy sand	
pale brown (10YR 6/3)	
clay loam or silty clay	
77777777	
100 CM.	

TEST UNIT: 50

SOIL PROFILE

CULTURAL MATERIAL

↓ ↓ ↓	↓ ↓ ↓ ↓
fill and new top soil mixed	22 shell casing
very dk brown	cut unburnt bone fragment
strong brown loamy sand	2 thin sheet metal frag + projectile point
	tertiary flake
pale brown silty clay-clay	piece of shatter
strong brown - reddish yellow coarse sand	
77777777	
100 CM.	

State Site # 21 AK 11 (Area C)County Aitkin Co., MNCrew C. Harrison J. MyrakerDate 8/20-21/85

TEST UNIT: S1

SOIL PROFILE 8/20

CULTURAL MATERIAL

black/very dk brn
Sandy loam
(10YR 2/1-2/2)

very dk grayish brown
dark brown
dk yellowish brown
loamy sand
- much gravel
(7.5YR 3/2-3/4)

very dark brown /
dk yellowish brown
sand & gravel
(7.5YR 3/2, 3/4-4/6)

//////////

0-10 1 large ear. shard, bent brass (!)
rim shard, 17 body shards (typ. A/E)
7 test flakes, piece of shatter
10 grind stone frag.
2 FCR frag.
3 unburnt bone frag.
2 charcoal frag.
20 body shard
test flake
30 FCR
crude biface
40
test flake
50
60
70
80
90
100 CM.

TEST UNIT: FT5

SOIL PROFILE 8/21

CULTURAL MATERIAL

See
attached
Sketch
map

4 sq. nails, 1 sheet iron frag, window glass,
1 small flint, 1 chert, 4 body shards,
6 pieces of debitage
10 rim shards, 5 body shards
4 pieces of debitage
FCR frag.
15 2 unb. 1 burnt bone frag.
body shard
5 pieces of debitage
4 char. fragments
20 1 rusty sq. nail
sterile
25
retained flake
3 pieces of debitage
poss. grindstone frag.
30 B.B. frag.

TEST UNIT: S2

SOIL PROFILE 8/20

CULTURAL MATERIAL

black/very dk brown
Sandy loam
(10YR 2/1-2/2)

dark brown
(2.5YR 4/4-4/6) Sandy loam

dk brown loamy
sand w gravel
(7.5YR 3/2-3/4)

Similar to 15-22

coarse sand
& gravel
//////////

0-10 proj. point
dec. w. shatter
3 rim shards
3 body shards
3 pieces of debitage
possible knapping stone
FCR frag.
20 10 B.B., 3 char. frags (vorn)
2 pieces of debitage
2 FCR fragments
30 FCR fragment
40
50
60
70
80
90
100 CM.

TEST UNIT: FT6

SOIL PROFILE 8/21

CULTURAL MATERIAL

C. f. STS2
& see
profile
on
attached
map

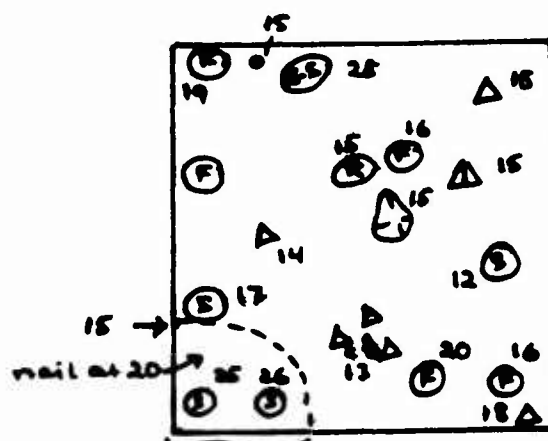
new shard, 2 body shards
A frag. pt
2 pieces of debitage
FCR, 2 B.B. frag., charcoal frag.
10 rim shards, 16 body shards
deb. frag. (3), 2 FCR
15 B.B., 3 unb. bone frag.
14 body shards
10 small flint, 1 chert, 1 sq. flint, 1 chert
other debitage (3), 14 B.B. frag.
20 debitage (4)
20 2 FCR, 2 B.B. frag.
debitage (2)
30 3 FCR, 6 B.B. frag.
8 pieces of debitage
40
1 flake, 1 FCR frag.
50

FT 5

21 AK 11 (Area C)

8-21-85

Some material found in screen
 (see separate list of artifact finds)



lens of greyish
 clayey soil -- gone
 by 26 cm (10YR 7.5-8)
 in matrix of dark brown
 sandy loam (2.5YR 7.5-8.5)

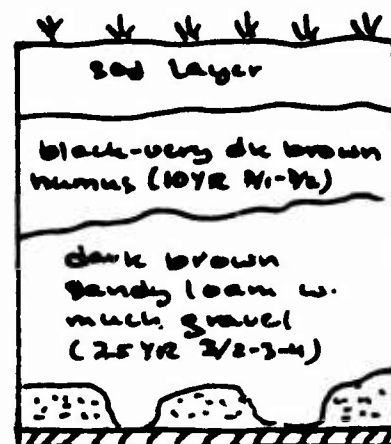
0 10 20 cm



- △ rim sherd
- △ body "
- ⊖ flake
- ⊖ shatter
- ⊖ grindstone fragment
- ⊖ FCR
- charcoal
- ⊖ rock

△ 28 depth of found item

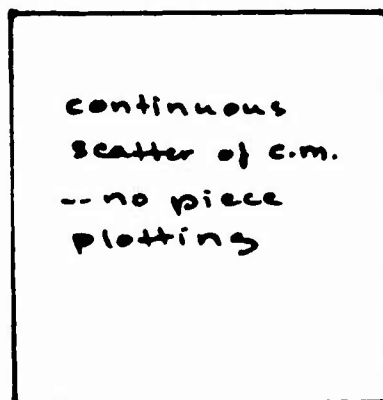
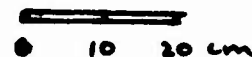
15 → --- depth of / outline
 of darker lens



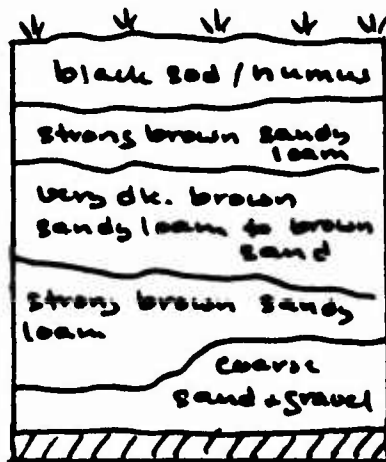
← inclusions of coarse sand
 & gravel -- sectioned and
 determined to be rodent
 burrows



S



E WALL



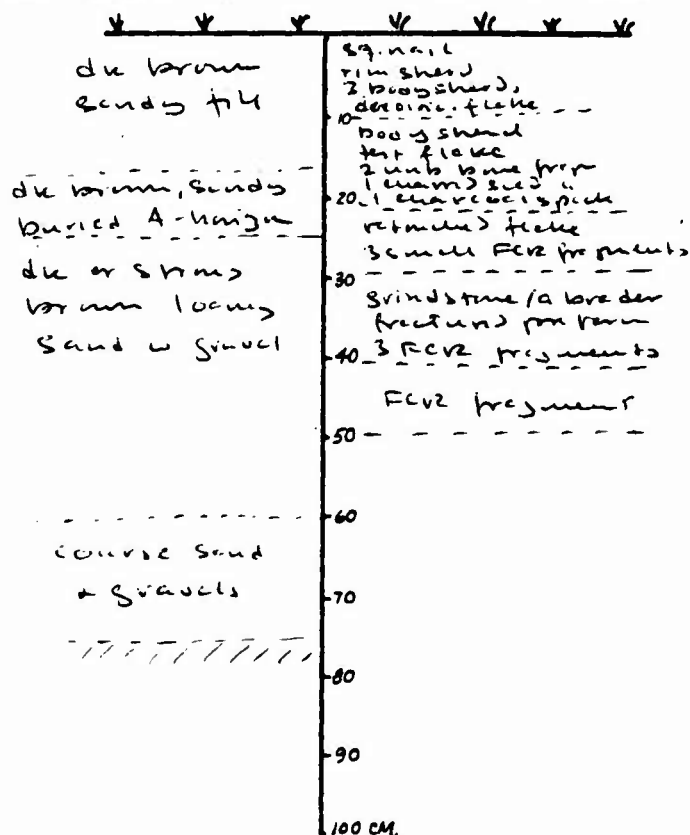
SOUTH WALL - BT 32

State site # 21 Avc 11 (Area C)County Itasca Co, MNCrew C. Harrison, J. MookDate 8/20-21/85

TEST UNIT: 53

SOIL PROFILE 8/20

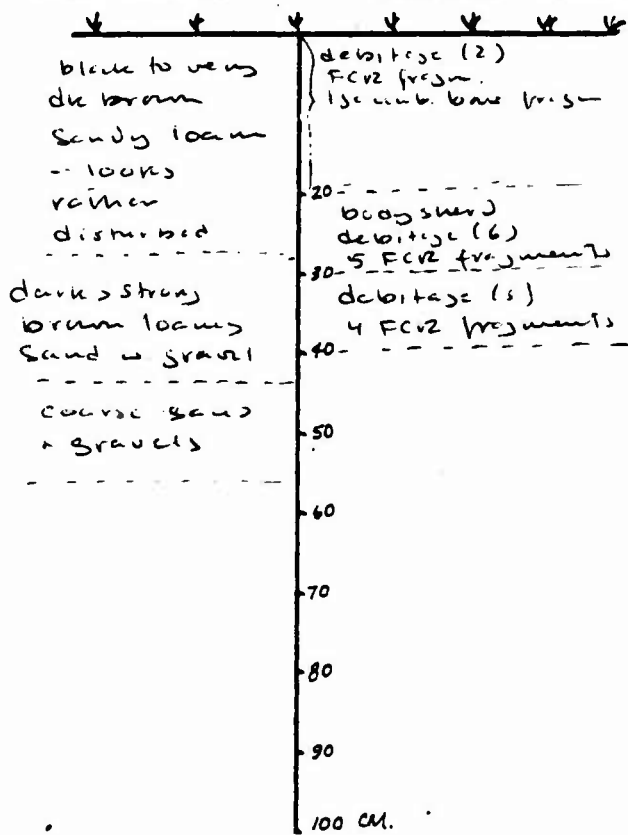
CULTURAL MATERIAL



TEST UNIT: 54

SOIL PROFILE 8/20

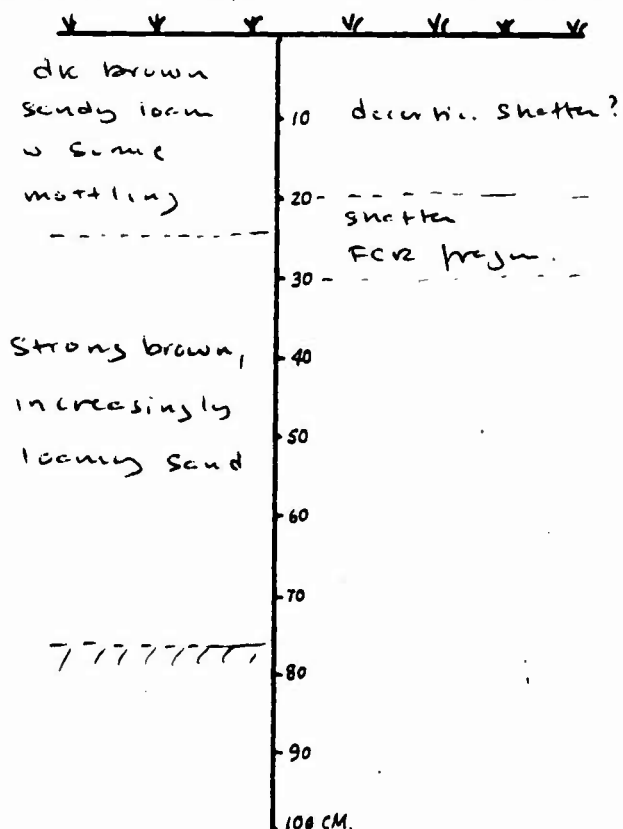
CULTURAL MATERIAL



TEST UNIT: 55

SOIL PROFILE 8/20

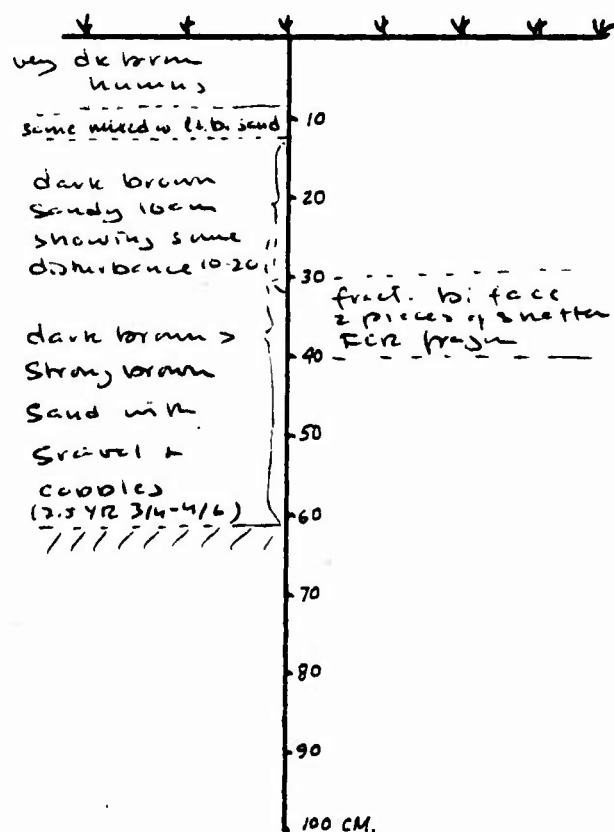
CULTURAL MATERIAL



TEST UNIT: 56

SOIL PROFILE 8/21

CULTURAL MATERIAL



Crew C. Harrison, J. Myler

Date 8-21-85

TEST UNIT: 57

SOIL PROFILE 8/21 CULTURAL MATERIAL

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

similar
to # 56

10
20
30
40 -- siltstone flecks
50
60
70
80
90
100 CM.

TEST UNIT: 58

SOIL PROFILE 8/21 CULTURAL MATERIAL

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

dark soil 2 sq. nails
blackish brown 10
sandy loam
20
Strong 30
loam
40
loamy 2 tent. siltstone flecks
sand 50
60
coarse 70
sand w.
pebbles &
80
concrete
90
100 CM.

TEST UNIT: 59

SOIL PROFILE 8/21 CULTURAL MATERIAL

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

very dk greyish
(10YR 3/2) brown silt loam
10
dk
brown yellowish
11 silt loam
(10YR 4/3-4/4)
20
very compacted
silt
30
loam
(10YR 5/2)
40
greyish brown
50
60
70
80
90
100 CM.

Sterile

TEST UNIT: 60

SOIL PROFILE 8/21 CULTURAL MATERIAL

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

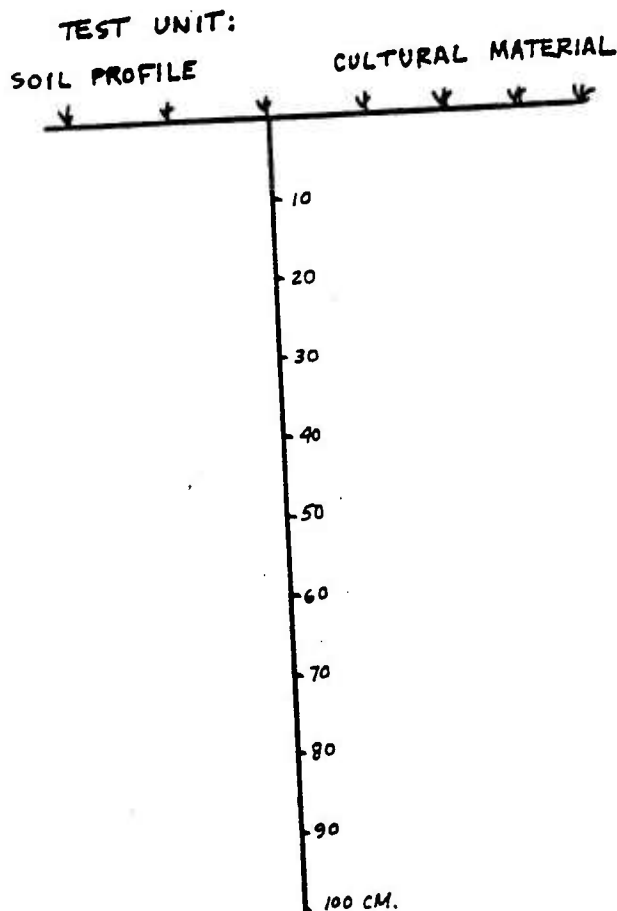
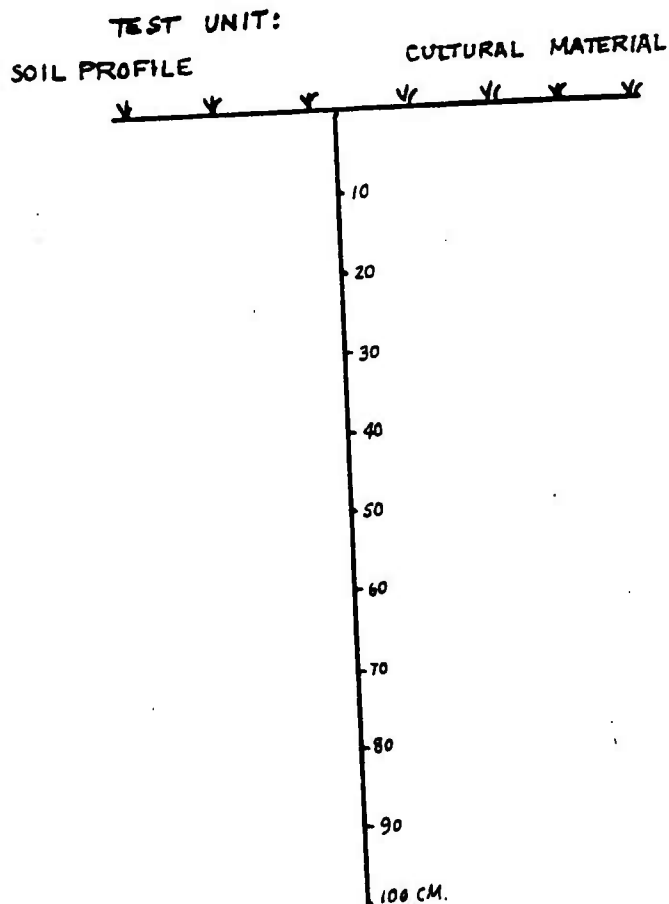
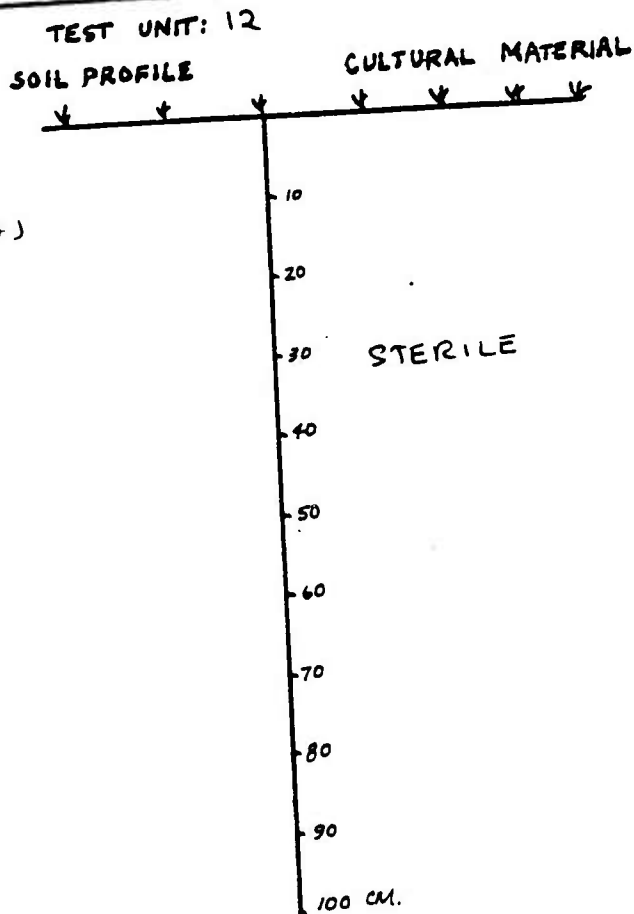
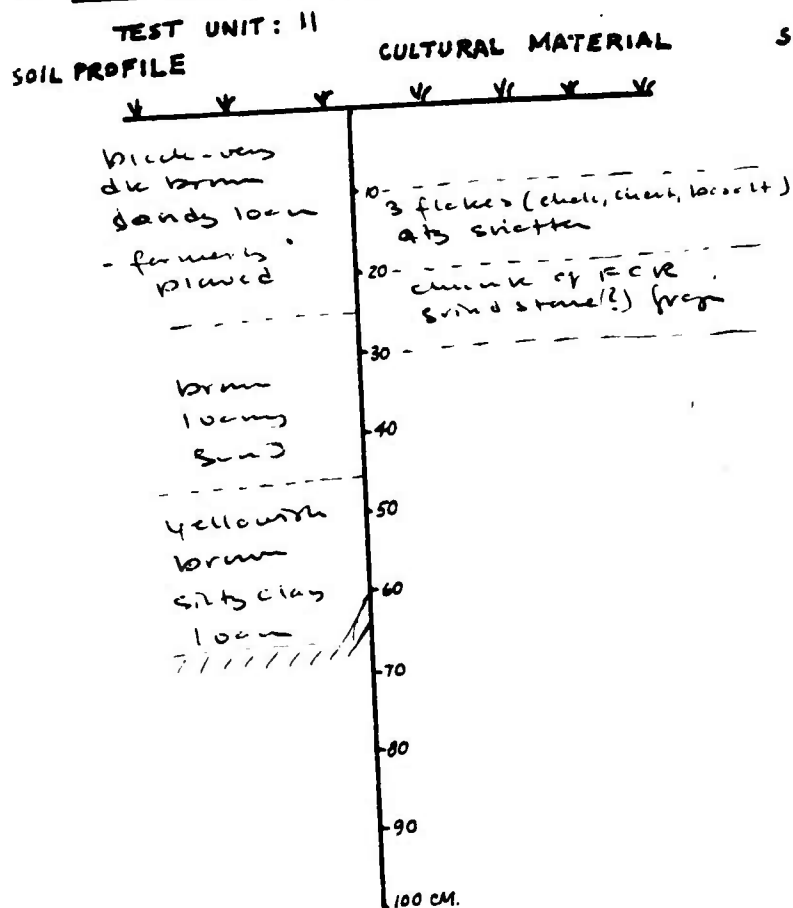
Fill 10
20
black, char. stained ← rusted three fence wire
30
strong brown
40
loamy sand
w some gravel
pebbles
50
60
70
80
90
100 CM.

State site # 21 AK 41 (Area D)

County Aitkin Co., MN

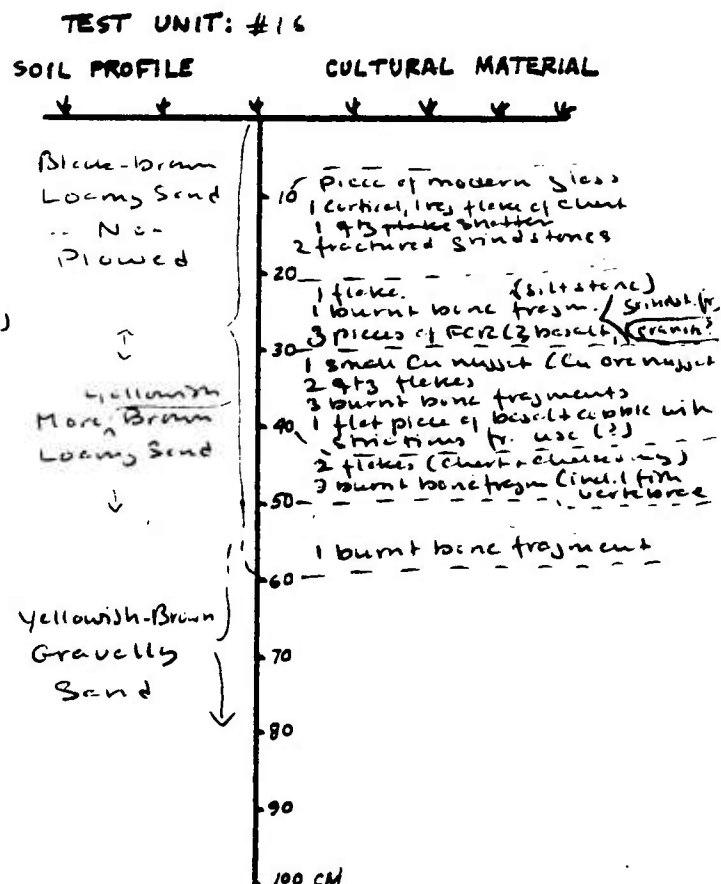
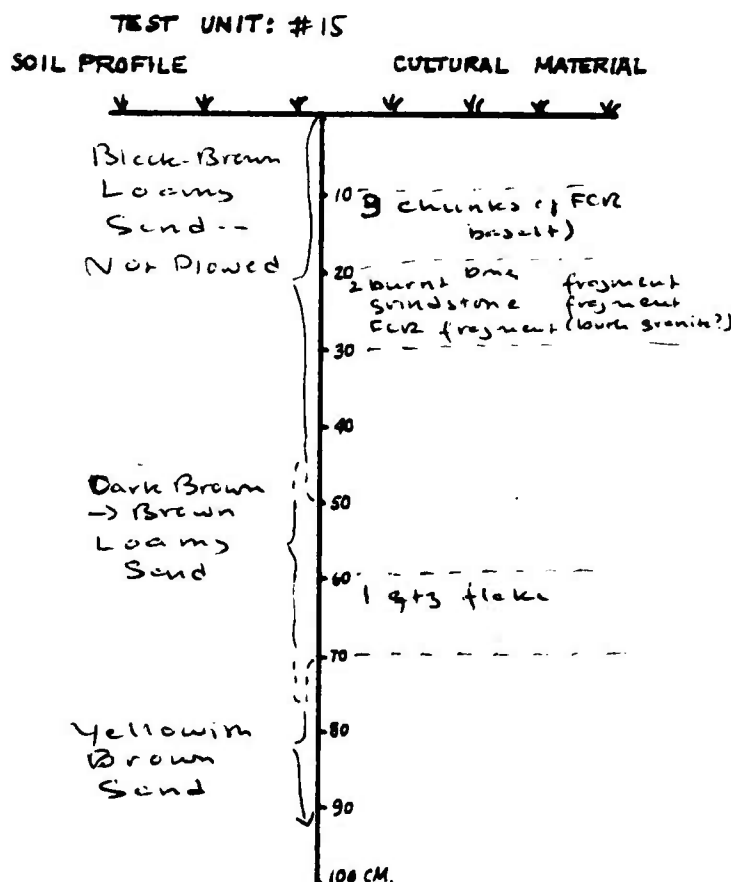
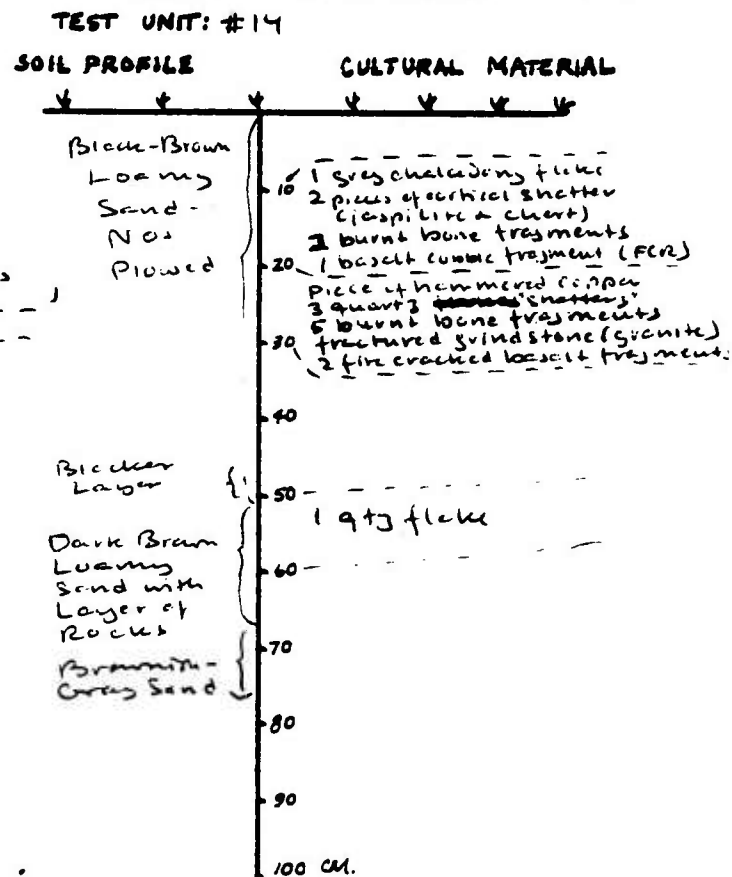
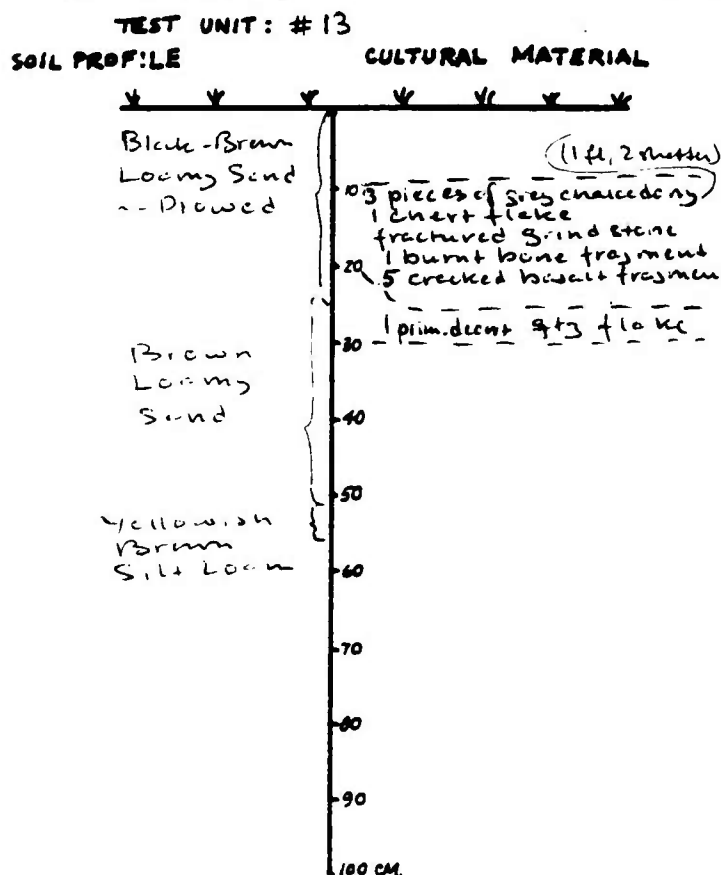
Date 6 10. 85

Crew E. Hanson - M. Rase -



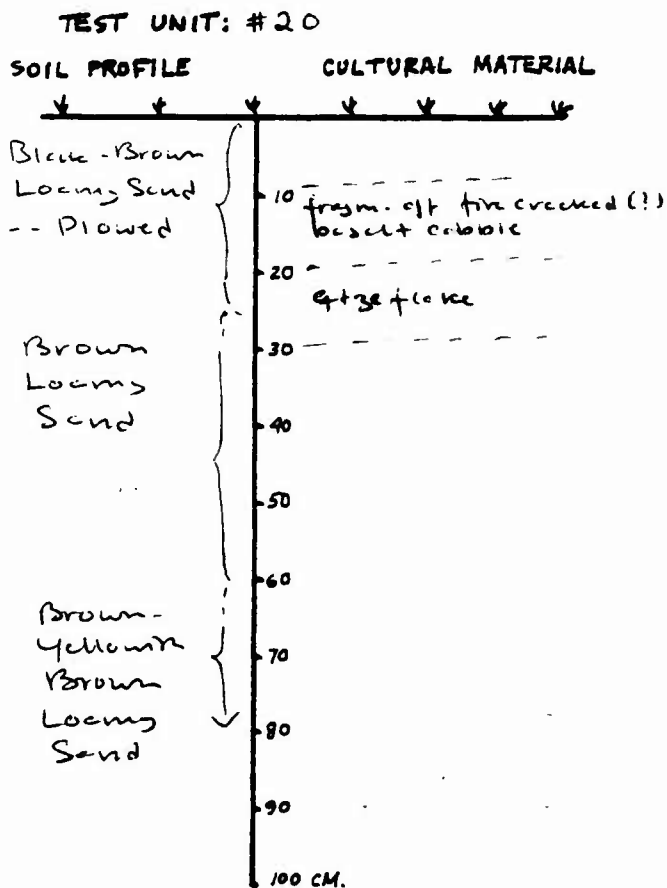
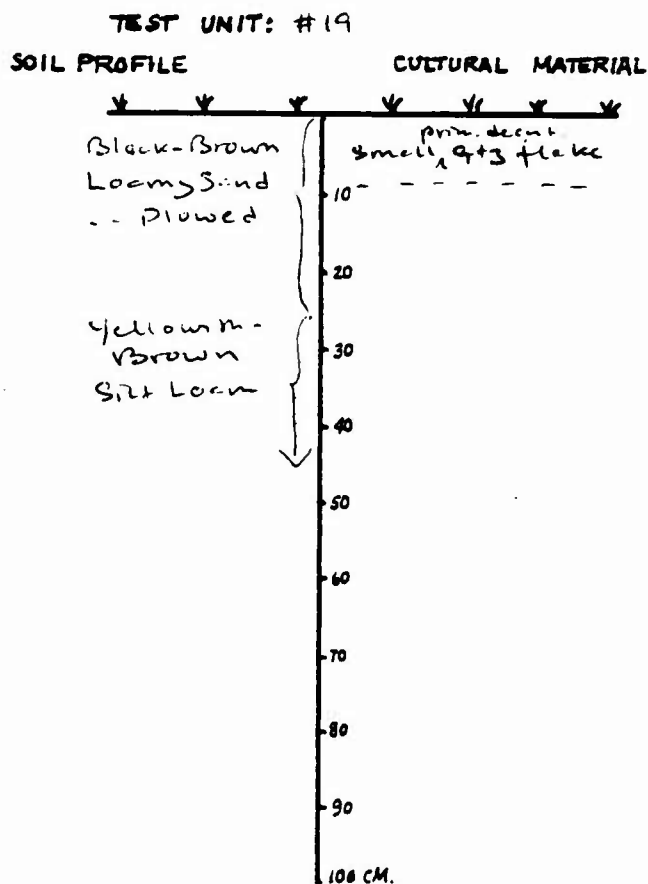
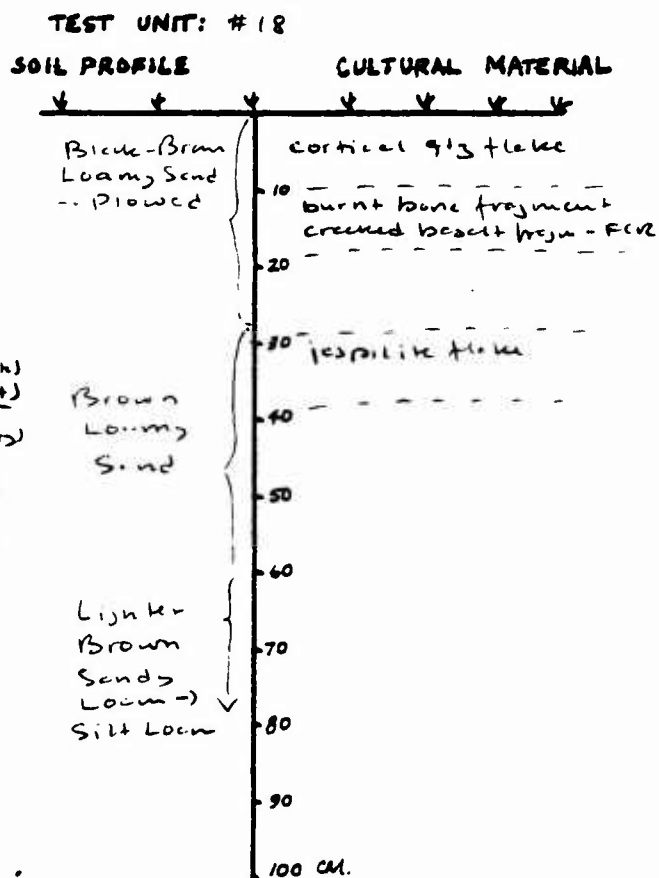
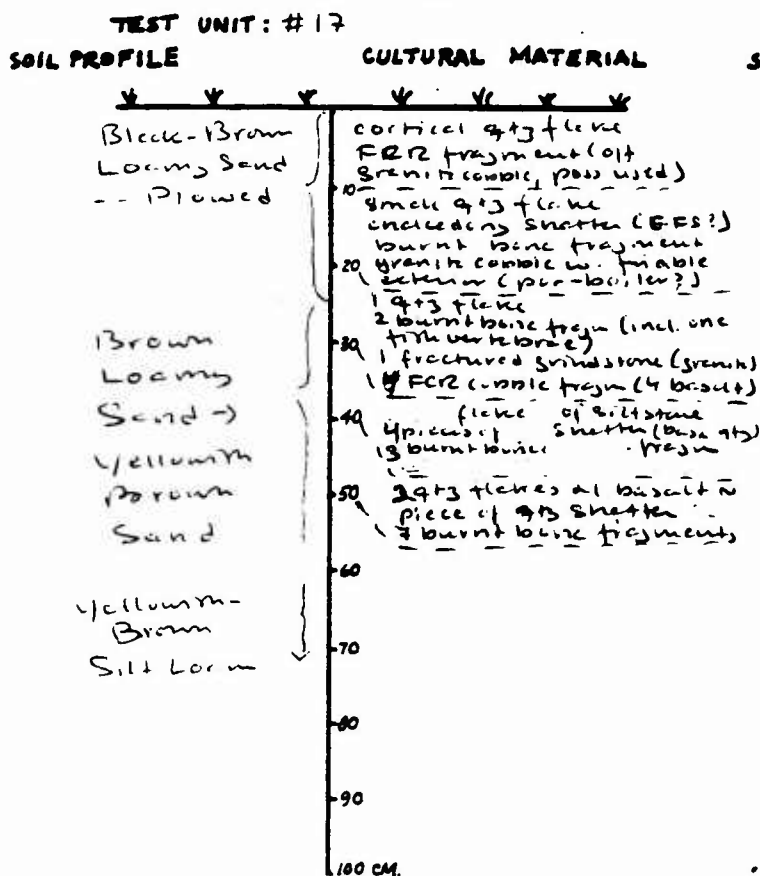
Crow C. Harrison, M. Regan

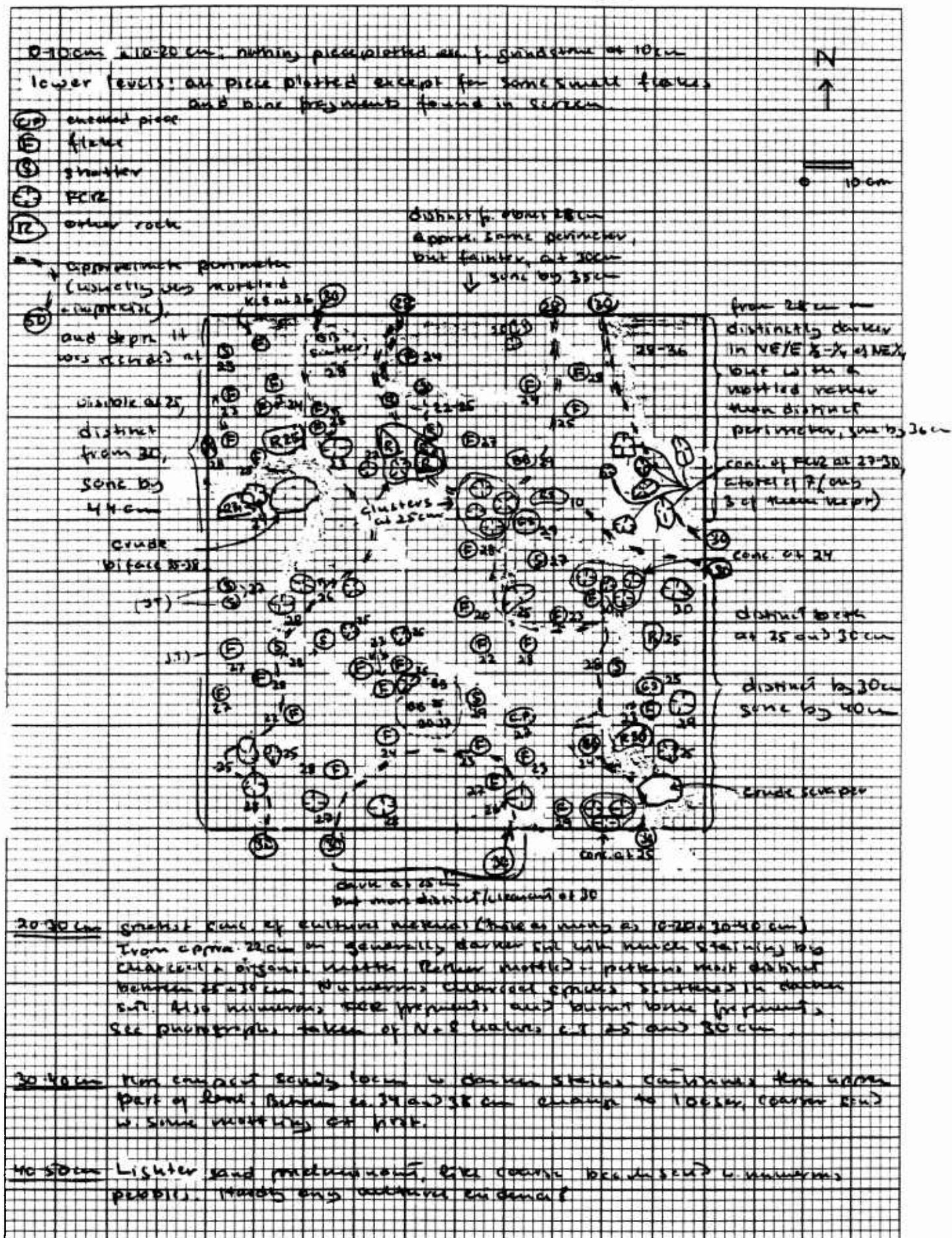
Date 6 10 11 85



Crew C. Harrison

Date 6.11.85

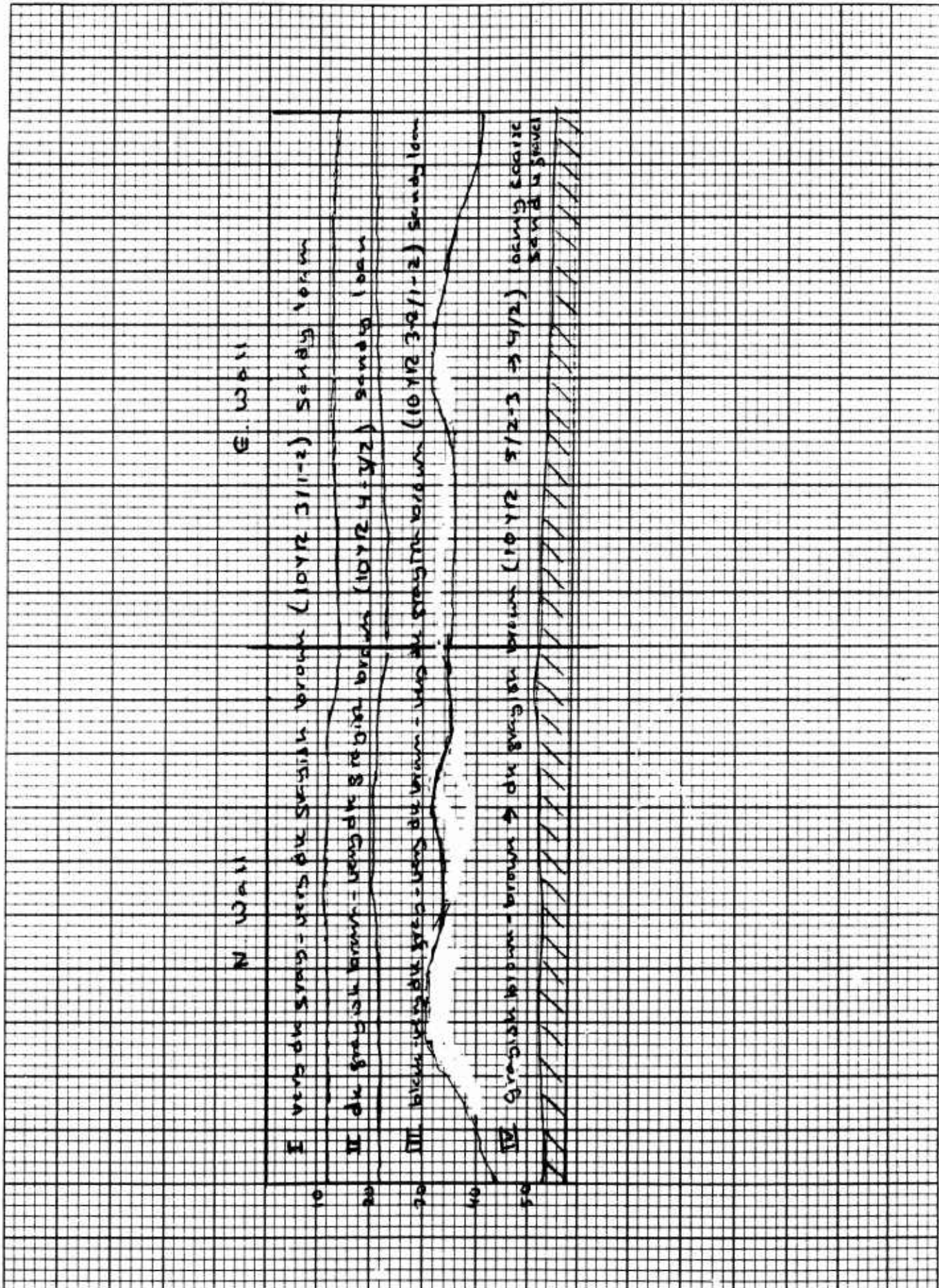




21 AK 11

FT3

8/3-4/85



Appendix C: Results of Soil Investigations

SOILS INVESTIGATIONS - SANDY LAKE RECREATION AREA

AUGUST 2, 1985

GRANT GOLTZ
SOIL SCIENTIST

On August 2, 1985, I conducted a complete soils investigation of the portion of the Sandy Lake Recreation Area north of the Sandy River. Also included was the area west and south of the sewage plant and maintenance building including the picnic area west of the entrance road. The purpose of this investigation was to determine the extent and nature of soil disturbance which might have affected any cultural resources present.

Field methods consisted of soil coring and observations of existing landforms. This was supplemented with examination of shovel test pits which were being done in the same areas by Christina Harrison and her crew.

Location map and detailed field notes are attached.

Results And Discussion

Examination of soil profiles showed major portions of the recreation area with little disturbance (see map). The 1951 borrow area is the major disturbance, but is less extensive than previously mapped. There has been significant disturbance associated with the campground construction, but most of this is confined to the roads and camping spurs and narrow adjacent areas. The remainder of the area shows localized leveling and filling. These are generally small spots and are easily recognized in cores and excavations. The peninsula south of the boat ramp is all mixed fill. The higher area immediately west of this fill area has had most of the surface soil layers removed.

Soils in the entire area are mostly sandy with dark surface horizons (A1) ranging from 5 to 30 centimeters thick. A typical soil profile consists of 10 to 15 centimeters of black loamy sand over a brown or yellowish brown subsoil. Several locations have black surface horizons thicker than 15 centimeters. This is not typical of soils in this area and probably is the result of past activities of Man.

Transect #1 - No. end of campground, E to W
3 cores, 10 m spacing

Undisturbed soil

A1 0-15cm 10YR 3/2 loamy sand

A2 15-25cm 10YR 5/3 loamy sand

B21 25-45cm 7.5YR 4/6-5/6 loamy sand

Transect #2 - Third spur from No. end of campground, E to W

Core A - Like transect #1

Core B - Like transect #1, but with 20-30cm fill

Transect #3 - Centered on fourth spur from No. end, E to W

Core A -

0-25cm Brown sandy fill

A1 25-35cm 10YR 2/1 sandy loam

A2 35-50cm 10YR 5/2 loamy sand

B21 50-60cm 10YR 5/6 loamy sand

Core B -

0-60cm lower B2 and C material, surface gone

Core C - 10m No. of B

0-30cm Fill

30+ Undisturbed

Core D - 5m W. of C

0-30 lower B and C material, surface gone

Core E - Borrow area west of road

0-30 Clean sand

30-50 Mixed soil

50-75cm Clean sand

Transect #4

Core A

0-25 Mixed sandy fill

A1 25-28 10YR 2/1 fine sandy loam

A2 28-30 10YR 6/2 fine sandy loam

B2 30-50 10YR 5/6 loamy sand

B3 50-70 10YR 6/4 loamy sand

Core B- 15m N, 34 deg E of A

0-5 Mixed sandy fill

A1 5-10 10YR 2/1 fine sandy loam

A2 10-15 10YR 6/3 loamy fine sand

B2 15-35 10YR 5/4 loamy fine sand

B3 35-50 10YR 6/4 loamy fine sand

50-60 7.5YR 5/6 loamy sand

Core C - 15m N 34 deg E of B
A1 0-23 10YR 4/3 loamy fine sand
A2 23-35 10YR 6/3 loamy fine sand
A&B 35-55 7.5YR 4/6 & 10YR 5/3 fine sandy loam
B3 55-75 7.5YR 5/6 & 10YR 5/4 loamy sand

Core D - 15m N 34 deg E of C
A1 0-20 10YR 3/1 loamy sand
A2 20-25 10YR 5/3 loamy sand
B2 25-50 10YR 4/6 loamy sand
B3 50-60 10YR 5/6 loamy sand

Core E - 15m N 26 deg W of D
A1 0-15 10YR 2/2 loamy sand
A2 15-25 10YR 6/3 loamy sand
B21 25-50 10YR 5/4 loamy fine sand
B22 50-80 7.5YR 5/6 loamy fine sand
B3 80-90 10YR 5/3 loamy fine sand

Core F - 15m N 26 deg W of E
A1 0-7 10YR 2/1 loamy fine sand
A2 7-17 10YR 6/2 loamy fine sand
A&B 17-40 10YR 6/3&5/6 fine sandy loam
B2 40-50 10YR 5/6 fine sandy loam

Core G - 15m N 46 deg W of F
A1 0-10 10YR 2/1 fine sandy loam
A2 10-17 10YR 6/3 fine sandy loam
B21 17-25 10YR 5/4 fine sandy loam
A&B 25-60 10YR 6/2 & 5/4 loam

Transect # 5 - starts between spurs 11 and 12

Core A
0-25 10YR 4/3 loamy sand, mixed A1 & A2 (plowed?)
B21 25-45 10YR 4/6 loamy sand

Core B - 30m S 56 deg E of A
A1 0-12 10YR 2/1 loamy sand
A2 12-20 10YR 5/2 loamy sand
B21 20-40 10YR 4/6 loamy sand
B22 40-50 10YR 5/6 loamy sand

Core C - halfway between A and B
(same as A)

Core D - 10m S of C
(same as A)

Core E - 15m S 56 deg E of B
A1 0-7 10YR 2/1 loamy sand
A2 7-15 10YR 5/3 loamy sand
B21 15-40 10YR 4/6 loamy sand
B22 40-45 10YR 5/6 loamy sand

Core F - 20m S 56 deg E of E
0-30 mixed surface horizons
30-40 B2 7.5YR 4/6 loamy sand

Core G - 15m S 56deg E of F
0-5 sand fill
A1 5-30 10YR 2/1 loamy sand (undisturbed soil profile)

Core H - 15m S 56 deg E of G
0-25 mixed surface horizons
25+ undisturbed loamy sand soil profile

Core I - 30 m S 56 deg E of H
Undisturbed sandy profile with 15 cm A1

Core J - 15m N 63 deg E of F
Undisturbed sandy profile with 15 cm A1

Core K - 30m N 63 deg E of J
Undisturbed sandy profile with 10 cm A1

Core L - 15m due E of K
0-15 Sand fill
15+ Undisturbed loamy sand profile with 10 cm A1

Core M - 15m due E of L
Undisturbed sandy profile with 30 cm A1
(Darker colors and higher organic matter content, B21 7.5YR 3/4)

Core N - 15m due E of M
Undisturbed sandy profile with 20 cm A1
(Darker colors like M)

Core O - 15m due E of N
Same as N

Core P - 15m S 34 deg W of B
Sandy profile with upper 25cm mixed

Core Q - 15m S 34 deg W of P
Undisturbed sandy profile with 30 cm A1
(Darker and redder than others)

Core R - 15m S 34 deg W of Q
Undisturbed sandy profile with 15 cm A1

Core S - 10m S 34 deg W of R
Undisturbed sandy profile with 15 cm A1

Non-transect Cores

15m N of spur # 12
Cut area with lower B3 horizon at surface

10m E of school foundation
0-25 mixed surface horizons
25+ undisturbed

Transect # 6 - Picnic area south of administration buildings

Five cores were taken at 15 m intervals starting at the north center of the area on a bearing of S 34 deg W

This area has little disturbance other some minor surface soil removal and compaction from use.

Area west and south of sewage plant and maintenance building

Several cores were taken randomly throughout the area

This area has had only minor disturbance. Several locations have thick (30cm+) A1 Horizons.

Appendix D: Comprehensive List of
Excavated Items

Abbreviations used

Abbreviations used in the following list of cultural materials:

- 33/15/8 -- maximum length/width/thickness of lithic item, in mm
- 32x14/5 -- maximum length or width x length or width/thickness of lithic item (when longitudinal axis cannot be determined)
- 47x35x22 -- when orientation of length/width/height of lithic item cannot be determined -- maximum dimensions only
- 31ap/15/8 -- length as preserved/width/thickness of damaged lithic item
- max. 16 -- maximum dimension of shatter or other lithic item without definite orientation indications
- no dimensions have been indicated for very damaged, fragmentary lithics

- 5.3 -- sherd thickness of 5.3 mm

FCR -- fire cracked rock

CWS -- cord-wrapped stick impressions

ST 1 -- Shovel Test #1

FT 2 -- Formal Test #2

UoM #3 -- University of Minnesota, Test #3

SMM #3 -- Science Museum of Minnesota, Test #3

Diagnostic items discussed in main text have been underlined.

AREA A (ridge north of river)

<u>ST 21</u>	0-22 cm	square and round nails; fragments of glass, mortar, burnt and unburnt bone, charcoal		
	54 cm	tertiary flake	mottled grey chert	15x11/3
<u>ST 22</u>	0-20 cm	historic evidence similar to ST 21		
	30-55 cm	" " " " " "		
<u>ST 23</u>	10 cm	sherd of glazed and decorated china		
	25 cm	shatter	translucent grey-brown silica	max. 33
<u>ST 24</u>	12-37 cm	fragments of bottle glass, thin wine(?) glasses, glazed china, rusted cans, unburnt bone; railroad spike; wire-cut nails		
<u>ST 25</u>	60 cm	decortication flake	siltstone	24/19/6
<u>ST 26</u>	10-20 cm	rusted wire-cut nail		
<u>ST 28</u>	20-30 cm	tertiary flake	reddish brown chert	14ap/20/5
		" " fragment	quartz	
		<u>hammerstone</u>	basalt	73x48x47
		<u>hammer & grindstone</u>	granite	56x54x40
<u>ST 31</u>	25-30 cm	<u>grindstone (?)</u>	basalt	120x60x49
	30-40 cm	decortication shatter	reddish brown chert	max. 22
		" "	siltstone	max. 24
<u>ST 33</u>	20-30 cm	body sherd (smoothed cord impr. on exterior)	fine grit-temper	5.9
		tertiary flake	quartz	11apx16ap/3.5
		decortication flake	jasper	32x32/9
		shatter (2 pieces)	quartz	max. 20 & 21
<u>ST 34</u>	10-20 cm	tertiary flake	reddish brown chert	8ap/12/2
		" "	grey chert	8/12/4
		decortication shatter	grey brown chert	max. 19
		FCR (grindstone or polisher fragment?)	granite	
		mammal bone fragments		
	20-30 cm	<u>neck or body sherd</u> (cord marked exterior, combed interior)	grit temper	4.5
		decortication flake	pink chert	21x17/5.5
		tertiary flake	" "	16x12/2
	30-40 cm	tertiary lamellar flake	pinkish white chert	18/8/1.5
		" flake	" " "	18x10/2
		" "	" grey "	16/12/2.3
		FCR fragment	granite	
	40-50 cm	fractured <u>end scraper</u>	jasper taconite	29/15ap/7

<u>ST 35</u>	0-10 cm	tertiary flake	quartz	8apx10/2.5
		" "	grey chert	20/21/6
		" "	basalt	28/16/4
		decortication flake	"	17x24/5.3
		" shatter	"	max. 16
		grindstone (fractured)	basalt	104x68x55ap
	10-20 cm	decortication flake	"	28/20/7
<u>ST 39</u>	40-50 cm	tertiary flake	jasper taconite	22ap/13/2.6
		shatter	quartz	max. 16
ST 40	10-20 cm	shatter	quartz	max. 30
		"	basalt	max. 16
	40-50 cm	tertiary flake	siltstone	26x22/4.8
		decortication shatter	jasper taconite	max. 35
<u>ST 41</u>	10-20 cm	decortication flake	quartz	10x8/3.5
	20-30 cm	neck sherd (Appendix F, #19)		9.5
		tertiary flake	"	6ap/12/1.8
		decortication shatter	basalt	max. 32
		shatter	"	max. 27
	30-40 cm	tertiary flake	quartz	12/29/3.7
<u>FT 1</u>	0-10 cm	glass bottle fragment		
		tertiary flake fragment	quartz	
		" " "	white quartzite	
	10 cm	(E/NE½) decortication shatter	quartz	max. 24
	10-20 cm	(W/SW½) shatter	"	max. 12
	26 cm	(NW/N½) tertiary flake	"	9x9/3
	25-28 cm	(W/SW½) fractured pebble (checked for flakeability?)	"	35x36x15
	25-30 cm	(SW½,ctr) FCR (fractured cobble)	granite	68x76x48
		(W/SW½) FCR fragment	basalt	
	30-35 cm	(SW½,ctr) decortication shatter	quartz	max. 17
	35cm	(NW/N½) tertiary flake	grey chert	23/14ap/4.6
		" "	quartz	20/20/3
	35-40 cm	(NW/N corner) biface/knife/drill	yellowish/white	54/17/6.8
		(NE/N½, decortication flake	orthoquartzite	
		S part)	quartz	12x8/1.6
		tertiary flake	"	13x15/2
		FCR (fractured cobble)	granite	50x45x29
		(W/SW½) tertiary flake	quartz	24/12/3.9
		" "	"	18/18/8
		" "	basalt	22x10/2.7
		" "	"	22/10/6.5
		shatter	quartz	max. 10

<u>ST 42</u>	30-40 cm	tertiary flake fractured <u>grindstone</u>	siltstone granite	18/18/3.6 60x40x40
	50-60 cm	possible FCR fragment	"	
<u>ST 44</u>	30-40 cm	<u>possible hammerstone</u> 2 possible FCR fragments	granite "	84x66x48
	40-50 cm	tertiary flake	quartz	17x8/3.4

On eroded surface S/SW of old schoolhouse: 2 tertiary flakes of white quartz.

AREA B (peninsula south of river/east of road)

UoM #1 (1m²)

0-30 cm	fill	
30-45 cm	side-notched projectile point flake knife 20 pieces of debitage 3 small cord-marked body sherds	white quartz no description " "

UoM #2 (1m²)

0-20 cm	(disturbed horizon): historic to recent metal and glass fragments, round nails	
0-52 cm	(20-52 cm horizon undisturbed): end scraper side scraper 21 pieces of debitage 1 cord-marked body sherd 5 mammal bone fragments	jasper taconite white quartz no description

UoM #3 (1m²)

0-10 cm	(disturbed): 2 porcelain fragments; 9 glass fragments	
0-35 cm	(10-35 cm horizon undisturbed): core 9 flakes	chert "

UoM #4 (1x2m) excavated into edge of the NW of two shallow depressions, depression oval and circa 3m x 4m wide and 10 cm deep, surrounded by slight embankment.

0-15 cm	(established soil profile): 14 glass fragments, 1 metal button, 1 square nail, 1 round wire nail 8 flakes (chert and quartz); mammal bone fragments	
15-40 cm	sterile layer of cobbles	

UoM #5 (1m²)

0-35 cm (undisturbed):

2 projectile point fragments	no description of raw material
	moss agate
5 side scrapers	chert
3 end scrapers	"
2 gravers	no description
68 flakes	chert and quartz
11 cord-marked body sherds	
2 mammal bone fragments	

35-40 cm sterile

Out of the four tests put in by a team from the Science Museum of Minnesota in 1977, two proved completely sterile (#7 and 8). Another one (#13) did not yield more than one piece of prehistoric debitage. Test #6, however, yielded a large number of historic items as well as some prehistoric ones, all between 0 and 30 cm: 45 colored bottle glass fragments, 67 clear glass fragments, 24 porcelain sherds, 3 crockery sherds, 11 metal can fragments (6 from snuff cases), 3 lead fragments, 1 metal hook, 1 metal shoe eyelet, 2 iron spikes, 1 square nail, 29 round nails, some clam shell, 41 bone fragments (fairly recent, some cut), 12 pieces of prehistoric debitage, 1 end scraper of chert. This test, a 0.5 m by 2 m trench, was excavated into the shallow depression west of the one excavated by the UoM team in 1975 (UoM #4). It appears to have uncovered part of a historic trash pit which in turn had been excavated into a prehistoric cultural deposit.

Area C (area south of river and west of road)ST 1 10-20 cm rim sherd (Appendix F, #13)

at lip: 8.8-9.5

below: 6

body sherd (Appendix F, Type J)

5.6

shatter

quartz

max. 14

"

"

" 14

20-30 cm window glass fragment

burnt glass fragment

square nail fragment

body sherd (Appendix F, Type K)

6.8

decortication shatter

quartz

max. 24

burnt bone fragment (unidentifiable)

30-40 cm thin glass fragment

square nail

rim sherd (Appendix F, #14)

at lip: 9

below: 5.3

body sherd (Appendix F, Type K)

4.5

body sherd (" " " L)

4.6

decortication shatter

quartz

Max. 12

FCR fragment

granite

<u>ST 1</u>	40-50 cm	neck sherd (Appendix F, #15)		5
		body sherd (" " , Type M)		5.5
		tertiary flake fragment	quartz	
		" " "	"	
		shatter	"	8 max.
		FCR fragment	granite	
<u>ST 2</u>	10-20 cm	round wire-cut nail		
		square nail		
		bottle glass fragment		
		body sherd (Appendix F, Type N)		5.1
		tertiary flake fragment	grey chert	
		3 FCR fragments	2 basalt/1 granite	
	30-40 cm	FCR fragment	granite	
	40-50 cm	fractured tertiary flake w. use wear	weathered silt-stone	58x38ap/15
		decortication shatter	quartz	max. 27
<u>ST 2, (Ext.)</u>	10-20 cm	bottle glass fragment		
		body sherd (Appendix F, Type O)		4.8
		small side scraper	quartz	16/12/3.3
		tertiary flake	"	21/11/5.2
		decortication shatter	"	max. 28
		shatter	"	max. 18
	20-30 cm	body sherd (Appendix F, Type J)		5.7
		charred wood fragment (probably recent)		
		2 FCR fragments	granite	
	30-40 cm	tertiary flake fragment	quartz	
		shatter	"	max. 17
	40-50 cm	charcoal fragments		
		burnt bone fragment (unidentifiable)		
		3 FCR fragments (disintegrating cobble)	granite	
	50-60 cm	tertiary flake	quartz	18ap/14/6
		burnt bone fragment (unidentifiable)		
		charcoal "		
		charred seed fragment (unidentifiable)		
<u>ST 3</u>	10-20 cm	shatter	quartz	max. 8
	20-30 cm	shatter	quartz	max. 22
		grindstone fragment	basalt	
<u>ST 4</u>	10-20 cm	body sherd (Appendix F, Type P)		6.8
		tertiary flake	quartz	10/10/2
		shatter	"	max. 14
		burnt bone fragment (long bone)		
	20-30 cm	square nail fragment		
		glass "		
		tertiary flake fragment	quartz	
		" "	weathered siltst.	
		grindstone fragment	granite	

<u>ST 5</u>	10-20 cm	round nails bottle glass fragment		
	20-30 cm	tertiary flake	grey/brown variegated silica	24/20/6
	40-50 cm	FCR fragment	basalt	
<u>ST 6</u>	10-20 cm	tertiary flake fragment	white chert	
	20-30 cm	decortication flake	quartz	12/18/3.6
<u>ST 7</u>	0-10 cm	decortication flake	white quartzite	37/48/35
	10-20 cm	large square spike		
		tertiary flake fragment	quartz	
		" " "	"	
		shatter	white chert	max. 24
		"	quartz	max. 8
		"	"	" 18
		"	brown chert	max. 14
	20-30 cm	<u>grindstone fragment</u> 2 FCR fragments	basalt "	
	40-50 cm	bottle glass fragment decortication shatter	quartz	max. 26
<u>ST 8</u>	10-20 cm	round nail <u>2 body sherds</u> (Appendix F, Type Q) tertiary flake " " fragment " " " <u>grindstone fragment</u> FCR fragment	siltstone " quartz basalt granite	8.7 (one split) 15ap/15/3.8 16/8/3.6
	30-40 cm	large square spike burnt bone fragment (unidentifiable) FCR fragment	basalt	
	50-60 cm	tertiary flake fragment	quartz	
<u>ST 9</u>	0-10 cm	tertiary flake fragment	quartz	
	10-20 cm	square nail bottle glass fragment		
	20-30 cm	<u>8 body sherds</u> (Appendix F, Type N) 3 FCR fragments	basalt	4-5.5
<u>ST 10</u>	10-20 cm	chunk of blacktop from old road <u>possible knapping stone</u> FCR fragment	basalt "	63x40x27
	20-30 cm	chunks of blacktop <u>body sherd</u> (Appendix F, Type N) chunk of rock with flake scars (checked piece?) <u>grindstone fragment</u> FCR fragment burnt bone fragment	basalt granite basalt	6

ST 10	30-40 cm	chunk of blacktop		
		body sherd (Appendix F, Type M)		5.3
		body sherd (" " " R)		6.3
	40-50 cm	large tertiary flake	jasper taconite	38ap/40ap/9.5
		tertiary flake	white silica	10ap/9/2
	50-60 cm	square nail		
		body sherd (Appendix F, Type J)		5.2
		" " (" " " L)		4.8
		" " (" " " M)		3.8
		" " (" " " O)		4.1
		" " (" " " S)		7
		shoulder/neck sherd (Appendix F, Type T)		8
		tertiary flake fragment	grey chert	
		decortication shatter	red chert	max. 11
		" "	siltstone	max. 18
FT 2	0-10 cm (fill)	rusted tin can		
		2 square nails		
		body sherd (Appendix F, Type L)		3.8
		tertiary flake	agate	18/10/2.5
		" "	quartz	14/8/2.4
	10-20 cm (fill)	FCR fragment	basalt	
		metal hinge		
		3 large square nails		
		2 round nails		
		glass plate fragment		
		neck sherd (Appendix F, #16)		6.3
		body sherd (" " " Type U)		7.5
		" " (" " " J)		6
		" " (" " " O)		5
		2 " " s(" " " L)		4.2 and 5.8
		tertiary flake	reddish chert	23/12/3.1
		" "	grey chert	10/14/2.7
		" "	pink chert	14x14/3
		shatter	quartz	max. 14
		" "	"	" 16
		2 FCR fragments	granite, basalt	
		large fire-cracked cobble	granite	max. 120
	20-25 cm (fill)	long round nail		
		square nail		
		small side-notched projectile point	jasper taconite	15/14/3.3
		near rim/neck sherd (Appendix F, #17)		6.7
		body sherd (Appendix F, Type M)		4.1
	25-30 cm (fill)	tertiary flake	quartz	6/8/2.3
		" "	siltstone	14ap/27ap/3.6
		shatter	quartz	max. 18
		3 FCR fragments	basalt	

32-40 cm	(N ₂)	neck sherd (Appendix F, #18)		6.1
		4 body sherds (" ", Type U)		4-5.2
(old plow horiz.)		tertiary flake fragment	siltstone	
		shatter	quartz	max. 16
		FCR fragment	basalt	
	(S ₂)	rusted tin can		
		body sherd (Appendix F, Type U)		4.7
		decortication shatter	quartz	max. 21
		FCR fragment	basalt	
40-50 cm	(N ₂)	5 body sherd (Appendix F, Type U)		3.8-5.3
		tertiary flake fragment	quartz	
		" "	basalt	18ap/16ap/3.6
		shatter	quartz	max. 16
		" "	" "	" 12
		burnt bone fragment (unidentifiable)		
	(S ₂)	3 body sherds (Appendix F, Type U)		4.2-5.6
		decortication shatter	grey/orange silica	max. 20
		shatter	quartz	max. 17
		burnt bone fragment (unidentifiable)		
50-60 cm	(N ₂)	retouched tertiary flake	siltstone	58/48/15
FT 4	0-10 cm	iron hook		
		blue glass fragment		
		2 body sherds (Appendix F, Type U)		4-5
		FCR fragment	basalt	
10-20 cm	(E ₂)	round nail		
		chunk of concrete		
		decortication shatter	quartz	max. 16
		2 FCR fragments	basalt	
	(W ₂)	4 body sherds (Appendix F, Type U)		3.8-5.5
		tertiary flake	brown silica	16/16/4.1
		shatter, 2 pieces	quartz	max. 16 and 20
		" "	jasper	max. 32
		2 FCR fragments	basalt	
20-30 cm	(E ₂)	1 body sherd (Appendix F, Type U)		6.4
		tertiary flake	quartz	12apx20/4.2
		" "	basalt	30x21/4.1
		2 FCR fragments	basalt & granite	
	(W ₂)	2 body sherds (Appendix F, Type U)		4.3-4.5
		tertiary flake	siltstone	8ap/14/2.3
		retouch/rejuvenation flake	pink/grey chert	7/6/1.1
		" " "	siltstone	5/4/1
		2 FCR fragments	basalt	
		burnt bone fragment (unidentifiable)		
30 cm	(E ₂)	decortication flake (center, S wall)	pink/grey chert	22x21/6.5
30-32 cm	(E ₂)	"checked" piece (as plotted)	quartz	50x36x16
30-40 cm	(E ₂)	tertiary flake (" " , at 40 cm)	siltstone	53/35/4.5
		" " (" " , at 36 cm)	basalt	24/30/5.1
		shatter, 2 pieces	quartz	max. 26 & 14

<u>FT 4</u>	30-40 cm	(E $\frac{1}{2}$)	grindstone fragment (as plotted)	basalt	
			5 FCR fragments " "	basalt	
		(W $\frac{1}{2}$)	body sherd fragment (smoothed cord impr.)		(split)
			tertiary flake (as plotted, at 35 cm)	brown silica	10ap/9/2.1
			" " (" " " 34 ")	white chert	13x20/4
			" " fragment	clear quartz	
			2 burnt bone fragments (unidentifiable)		
			FCR (decomposing cobble - pot boiler?)	granite	max. ca. 60
	40-45 cm	(W $\frac{1}{2}$)	tertiary flake (as plotted, at 45 cm)	brown chert	16x16/2
			3 burnt bone fragments (unidentifiable)		
			2 FCR fragments	basalt	
<u>SMM #1</u>			sterile		
<u>SMM #2</u>	0-10 cm		5 flakes	chert, brown silica, 3 quartz	
	10-20 cm		body sherd (cord marked, grit tempered)		
			8 flakes	2 jasper taconite, 5 chert, 1 quartz	
			9 pieces of shatter	quartz	
			10 bone fragments (includ. 1 fish vertebrae)		
	20-30 cm		7 flakes	2 jasper taconite, 5 quartz	
			9 pieces of shatter	quartz	
	30-45 cm		7 flakes	basalt, chert, 5 quartz	
			2 burnt bone fragments		
	45-55 cm		4 flakes	jasper taconite, 3 quartz	
			burnt bone fragment		
<u>SMM #3</u>	0-10 cm		neck sherd (smooth exterior w. CWS impr.)		
			2 body sherds (cord marked, grit tempered)		
			shatter, flake	quartz & jasper	
			hammerstone fragment	granite	
			5 FCR fragments	basalt	
	10-20 cm		round nail		
			2 body sherds (cord marked, grit tempered)		
			2 flakes	brown silica, siltstone	
			shatter, 3 pieces	quartz	
			grindstone fragment	basalt	
			9 FCR fragments	mostly basalt	
	20-30 cm		round nail		
			rim sherd (oblique CWS; punctates)	thickened lip	
			split rim/neck sherd (horizontal CWS; combing)		
			cradle preform (?)	brownish grey silica	
			3 flakes	chert, 2 basalt	
			bone fragment		
	30-40 cm		body sherd (cord marked, grit tempered)		
			8 flakes	3 chert, 5 quartz	
			4 FCR fragments		
	40-50 cm		5 flakes	1 jasper taconite, 2 chert, 2 quartz	
			5 FCR fragments	basalt & other igneous rock	
<u>SMM #4</u>			sterile		

<u>ST 45</u>	0-10 cm	hand forged nail fragment tertiary flake decortication shatter	siltstone quartz	11/10/2.5 44x15x8
	10-20 cm	hand forged nail <u>grindstone (?) fragment</u>	friable sandstone	
	20-30 cm	3 FCR fragments	granite	
	30-40 cm	decortication shatter, 2 pieces " "	quartz orange/brown chert	max. 10 and 18 max. 21
<u>ST 46</u>	0-10 cm	FCR fragment	basalt	
<u>SMM #14</u>	(no level indications): 3 tin can fragments, 2 square nails, 1 porcelain sherd, 3 body sherds (cord marked, grit tempered), 6 flakes (chert, 2 quartz, 3 basalt), 8 bone fragments (including 2 tooth fragments and 1 fish jaw fragment)			
<u>ST 47</u>	0-10 cm	chunk of concrete 5 unburnt, cut bone fragments		
	20-30 cm	4 FCR fragments	basalt	
	30-40 cm	small piece of FCR	"	
	40-50 cm	tertiary flake fragment	grey silica	
<u>ST 48</u>	0-20 cm	square nail 21 round nails FCR fragment unburnt, cut bone fragment	basalt	
	50-60 cm	tertiary flake	siltstone	19/16/1.7
<u>ST 50</u>	0-10 cm	shell casing		
	20-30 cm	cut, unburnt bone fragment		
	30-40 cm	2 rusted sheet metal fragments <u>triangular projectile point</u> tertiary flake	brown silica quartz	18/15/3.6 16/20/4.5
	40-50 cm	shatter	"	max. 20
<u>ST 51</u>	0-20 cm	porcelain sherd sheet metal fragment <u>rim sherd (Appendix F, #1)</u>		at lip: 7.5 below: 7
		<u>3 body sherds</u> (Appendix F, Type A)		5.3-6.5
		<u>body sherd</u> (" " " B)		5.5
		<u>4 body sherds</u> (" " " C)		3-4.5
		<u>4 body sherds</u> (" " " D)		3-4
		<u>5 body sherds</u> (" " " E)		3.8-5
		<u>tertiary flake</u>	smoke colored silica	14/11/2 & 9ap/9/1
		" "	siltstone	14ap/18/2.6
		" "	"	9/15/3

<u>ST 51</u>	0-20 cm	tertiary flake	basalt	15ap/18/3.1
		" " fragments	quartz	max. 9 & 14
		decortication shatter	"	max. 27
		<u>grindstone fragment</u> (fire cracked)	granite	
		2 FCR fragments	basalt, granite	
		3 unburnt bone fragments		
	20-30 cm	2 charcoal fragments		
		<u>body sherd</u> (Appendix, Type D)		2.9
		tertiary flake	quartz	14ap/19/3.8
		FCR (disintegrating cobble - pot boiler?)	granite	
	30-40 cm	3 FCR fragments	basalt	
		<u>crude biface</u> (chopper/cleaver)	basalt	180/110/37
	40-50 cm	tertiary flake	jasper taconite	27/31/6.3
		" " fragment	pink/white chert	11ap/11/2.8
<u>FT 5</u>	0-10 cm	4 square nails		
		rusted sheet metal fragment		
		7 window glass fragments		
		<u>gun flint</u>	dark greyish brown	18x18/6
			chert (flint)	
		<u>copper awl</u>		36/6x2.8
		3 <u>body sherds</u> (Appendix F, Type C)		3.5-5
		1 <u>body sherd</u> (" " " " E)		5
		decortication flake	brown silica	38/21/6
		tertiary flake	orange/red chert	14/9/2.3
		decortication shatter, 2 pieces	quartz	max. 12 & 20
		shatter, 2 pieces	"	max. 16 & 17
	10-15 cm	2 <u>rim sherds</u> (same rim, Appendix F, #2, as plotted)		at lip:11
		<u>rim sherd</u> (Appendix F, #3, as plotted)		at lip: 5.5-7.5
				below: 4.5
		<u>body sherd</u> (" " " " Type A, as plotted)		7.7
		<u>body sherd</u> (" " " " B, " ")		5.7
		3 <u>body sherds</u> (" " " " C, " ")		3.5-4.3
		decortication shatter (as plotted)	jasper taconite	20/38/11
		tertiary flake fragments	siltstone & quartz	
		retouch/rejuvenation flake	white chert	5/4/1.6
		FCR fragment (center of unit)	basalt	
		3 unburnt bone fragments (1 unidentifiable)		
	15-20 cm	<u>body sherd</u> (Appendix F, Type C; as plotted)		4
		tertiary flake (" ")	siltstone	14/19/4.1
		" " fragment (" ")	"	
		" " fragments (" ")	quartz	
		decortication shatter (" ")	jasper taconite	20x36x11
		4 charcoal fragments		
		rusty square nail		

<u>FT 5</u>	20-30 cm	<u>tertiary flake w. retouch & use wear</u> (as plotted)	jasper taconite	31ap/30/3.6
		tertiary flake fragment	quartz	
		shatter, 2 pieces (as plotted)	"	max. 18 (both)
		FCR - possible grindstone (as plotted)	basalt	
<u>ST 52</u>	0-10 cm	<u>triangular projectile point</u>	orange chert	18/13/3.5
		decortication shatter	red-brown chert	max. 35
	10-20 cm	<u>rim sherd</u> (Appendix F, #4)		at lip: 9.5
				below: 6
		<u>neck sherd</u> (Appendix F, #5)		4.3
		<u>neck sherd</u> (" " , #6)		4.8
		<u>3 body sherds</u> (Appendix F, Type F)		4-5
		<u>4 body sherds</u> (" " , " G)		4.3-6
		decortication flake	basalt	60ap/45/7
		tertiary flake fragments	siltstone & quartz	max. 10 & 9
		<u>possible knapping stone (?)</u>	metamorphic rock	
		FCR fragment	granite	
		10 burnt bone fragments (5 unidentifiable)		
		3 charred seed fragment (all ")		
	20-30 cm	decortication shatter	basalt	max. 50
		" "	quartz	max. 20
	30-40 cm	2 FCR fragments	basalt	
		FCR fragment	basalt	
<u>FT 6</u>	0-10 cm	<u>rim sherd</u> (Appendix F, #7)		at lip: 6.2
				below: 5.5
		<u>2 rim sherds</u> (same rim, Appendix F, #8)		at lip: 5.8
				below: 4.4
		<u>neck sherd</u> (Appendix F, #9)		6.5
		<u>neck sherd</u> (" " , #10)		5
		<u>neck sherd</u> (" " , #5)		4.2
		<u>2 body sherds</u> (" " , Type H)		4.5
		<u>triangular projectile point</u>	greyish pink	12/12/3
			cortical silica	
	10-15 cm	tertiary flake	brown silica	10/8/1.5
		" " fragment	quartz	
		FCR fragment	basalt	
		2 burnt bone fragments (unidentifiable)		
		(dense scatter -- no piece plotting)		
		<u>rim sherd</u> (#4)		at lip: 9
				below: 5.5
		<u>neck sherd</u> (#10)		5-5.5
		<u>2 rim sherds and 2 near rims</u> (#8)		at lip: 5, 5-6.5
				below: 4-4.5
		<u>3 neck sherds</u> (similar to #5)		4.2-4.4
		<u>neck sherd</u> (Appendix F, #11)		6.6
		<u>12 body sherds</u> (similar to Type F)		3.5-7, aver. 4.5
		<u>4 body sherds</u> (" " " G)		
		tertiary flake	siltstone	29/20/6.5
		" " fragment	brown silica	

<u>FT 6</u>	10-15 cm	decortication flake	white chert	26x13/5
	(cont'd)	2 FCR fragments	basalt & rhyol.(?)	
		15 burnt bone fragments	unidentifiable	
		7 unburnt " "		
	15-20 cm	4 body sherds (similar to Appendix F, Type J)		5-5.5
		10 tertiary flakes/flake fragments	brown silica	8-16 mm max. w/l
		shatter	" "	& 0.8-1.5 max th.
		fractured pebble checked for flakeability?	" "	max. 28
		23 tertiary flakes/flake fragments, some	siltstone (all	18/10/8
		possibly retouch/rejuvenation flakes	apparently off	a third less than
			same core) *	7 mm max w/l and
				1 mm max. thickn.
				rest 8-12 mm max.
				w/l & 1.5 max. th.
		tertiary flake fragment	quartz	max. 8/1.2
		shatter	grey silica	max. 12
		"	whitish-grey chert	max. 26.
		14 burnt bone fragments	unidentifiable	
	20-25 cm	tertiary flake	siltstone *	15/9/1.2
		ret./rej. flake	" *	8/5/1
		" " "	" *	7/5/0.9
		shatter	quartz	max. 11
		3 FCR fragments	basalt	
		3 burnt bone fragments	unidentifiable	
	25-30 cm	tertiary flake fragment	quartz	
		shatter	quartz	max. 20
		3 FCR fragments	basalt	
		6 burnt bone fragments	unidentifiable	
	30-40 cm	tertiary flake	siltstone	14ap/13/1.6
		" "	"	10/15/3.5
		" "	"	14/11/1.5
		" " fragment	grey chert	
		" "	quartz	22/10/4
		decortication flake	jasper	20ap/24/4.2
		" shatter	"	max. 34
		" "	quartz	max. 24
	40-50 cm	decortication flake	quartz	58/58/19
		FCR - cobble fragment	basalt	
<u>ST 53</u>	0-10 cm	square nail		
		<u>rim sherd</u> (Appendix F, #12)		at lip: 5.7
				below: 6
		2 body sherds (Appendix F, Type I)		4.2-4.5
		decortication shatter	quartz	max. 18
	10-20 cm	body sherd (Appendix F, Type I)		4.5
		tertiary flake	reddish grey chert	25/9/2.8
		2 unburnt bone fragments	unidentifiable	
		1 charred seed fragment	"	
		charcoal speck (not kept)		

<u>ST 53</u>	20-30 cm	<u>retouched tertiary flake</u> 3 small FCR fragments (disintegrating cobble -- possibly a pot boiler -- not kept)	siltstone friable granite	39/29/8
	30-40 cm	<u>grindstone or abrader</u> <u>fractured crude biface (preform)</u> 3 FCR fragments	fine grained sedi- mentary rock reddish chert basalt	ca. 100x65/25 29ap/28/12
	40-50 cm	FCR fargment	basalt	
<u>ST 54</u>	0-20 cm	tertiary flake decortication shatter FCR fragment unburnt mammal longbone fragment	siltstone quartz basalt	17ap/22/3 max. 24
	20-30 cm	body sherd (similar to App. F, Type I) tertiary flake fragment " " " decortication shatter " " shatter " " 5 FCR fragments	quartz " " " " " 2 granite, 3 basalt	4.5 max. 14 max. 16 max. 12 max. 16
	30-40 cm	tertiary flake decortication shatter " " shatter " " 2 FCR fragments -- same cobble 2 " " " "	quartz reddish grey agate grey chert quartz " jasper basalt	32x14x4.2 max. 19 max. 30 max. 16 max. 11
<u>ST 55</u>	0-20 cm	decortication shatter	quartz	max. 28
	20-30 cm	shatter FCR fragment	" granite	max. 30
<u>ST 56</u>	30-40 cm	<u>fractured biface</u> shatter " FCR fragment	weathered siltstone quartz " basalt	60ap/60/12 max. 16 max. 16
<u>ST 57</u>	40 cm	tertiary flake	siltstone	30/14/2.5
<u>ST 58</u>	0-10 cm	2 square nails		
	40-50 cm	tertiary flake " "	basalt siltstone	19/23/3.3 12ap/8/2
<u>ST 60</u>	10-20 cm	chunk of decomposing mortar 2 possible FCR fragments -- not kept burnt bone fragment		
	20-30 cm	hand-forged square nail prism/pendant	black plastic	

<u>ST 60</u>	20-30 cm	shatter	quartz	max. 18
	(cont'd)	FCR fragment	basalt	
		burnt bone fragment	unidentifiable	
		unburnt bone "	"	
	30-40 cm	<u>grindstone fragment</u>	granite	50x38x35
		2 FCR - off same cobble -- not kept	friable granite	
		2 possible FCR fragments -- not kept	basalt	
	50-60 cm	glass fragment (quite recent window glass)		

AREA D (south of Area B and east of road)

<u>ST 11</u>	10-20 cm	decortication flake	greyish silica	16/10/2
		" "	basalt	22/26/7.5
		tertiary flake fragment	grey chert w.	
			black striations	
		shatter	quartz	max. 17
	20-30 cm	<u>grindstone fragment</u>	granite	
		FCR fragment	basalt	
<u>ST 12</u>		sterile		
<u>ST 13</u>	10-20 cm	tertiary flake	red chert	18apx20ap/5.4
		" " fragment	grey silica	7ap x 19ap/3.8
		decortication shatter	" "	max. 29
		" "	" "	max. 24
		<u>grindstone fragment</u>	granite	
		5 FCR fragments	basalt	
		burnt bone fragment	unidentifiable	
	20-30 cm	decortication shatter	quartz	mx. 25
<u>ST 14</u>	10-20 cm	tertiary flake	grey silica w.	10/10/1.3
			dark mottling	
		decortication shatter	grey chert	max. 24
		" "	jasper taconite	max. 20
		FCR fragment	basalt	
		2 burnt bone fragments	unidentifiable	
	20-30 cm	<u>grindstone fragment</u>	granite	
		2 FCR fragments	basalt	
	near 30	piece of hammered copper		
		decortication shatter	quartz	max. 21
		shatter (2 pieces)	"	max. 14 & 16
		5 burnt bone fragments	unidentifiable	
	50-60 cm	tertiary flake fragment	quartz	

<u>ST 15</u>	10-20 cm	3 FCR fragments	basalt	
	20-30 cm	<u>grindstone fragment</u> FCR fragment 2 burnt bone fragments	granite granite deer antler?	
	60-70 cm	tertiary flake fragment	quartz	
<u>ST 16</u>	10-20 cm	bottle glass fragment tertiary flake decortication shatter " "	white/pink/grey mottled chert pinkish grey chert quartz basalt granite	15/12ap/2.6 max. 25 max. 17
		<u>grindstone fragment</u> <u>grindstone fragment</u>		
	20-30 cm	<u>decortication flake (fractured) with use-</u> <u>wear and some retouch</u> burnt bone fragment <u>grindstone fragment</u> 3 FCR fragments	siltstone long bone of lge mammal - iden- tifiable? granite basalt	47ap x 45ap/6.6
	30-40 cm	pebble like copper nugget tertiary flake fragment tertiary flake abrader fragment with distinct use-wear 3 burnt bone fragments	 quartz " basalt unidentifiable	10.5 max. diam. 7/7/2.5
	40-50 cm	tertiary flake " "	chert grey-brown silica	11/7/1.4 4ap/13/2.9
		burnt fish vertebrae 2 burnt bone fragments	unidentifiable	
	50-60 cm	burnt bone fragment	"	
	<u>ST 17</u>	0-10 cm <u>decortication flake with possibly deliberate</u> <u>notching and possible use wear</u> decortication shatter	granite	64 x 40/10
	10-20 cm	tertiary flake decortication shatter burnt bone fragment heat damaged cobble -- <u>pot boiler?</u>	quartz quartz grey silica unidentifiable granite	max. 20 9ap/5/1.6 max. 11 ca. 55 max. diam.
	20-30 cm	tertiary flake <u>grindstone fragment</u> burnt fish vertebrae burnt long bone fragment 4 FCR fragments	quartz granite not identifiable as to species basalt	14/19/8 estimated max. width 110 mm
	30-40 cm	tertiary flake decortication shatter " " (3 pieces) 3 burnt bone fragments	siltstone basalt quartz unidentifiable	14/10ap/1.1 max. 60 max. 14,16 & 17

<u>ST 17</u>	40-50 cm	tertiary flake	quartz	17 x 10/1.4
		" "	"	9x8/4.1
		" "	basalt	15ap/25ap/4
		shatter	quartz	max. 12
		7 burnt bone fragments	unidentifiable	
<u>ST 18</u>	0-10 cm	decortication flake	quartz	14 x 10/2.5
	10-20 cm	FCR fragment	basalt	
		burnt bone fragment	unidentifiable	
	30-40 cm	tertiary flake	jasper taconite	23ap/20/3.3
<u>ST 19</u>	0-10 cm	tertiary flake	quartz	9/6/0.9
<u>ST 20</u>	10-20 cm	FCR fragment	basalt	
	20-30 cm	tertiary flake fragment	white quartzite	13ap/12ap/3.1
<u>FT 3</u>	0-10 cm	tertiary flake	white chert	9ap/9/2.1
	(NW $\frac{1}{4}$)	2 FCR fragments	basalt & granite	
		burnt bone fragment	unidentifiable	
	0-10 cm	tertiary flake	Tongue River Silica	16ap/21/5
	(NE $\frac{1}{4}$)	" "	grey chert	10/7/1.5
		" "	quartz	10/10/3
		" "	"	7/5/2.1
		" "	white quartzite	10/9/2.5
	0-10 cm	tertiary flake	quartz	20 x 9/2
	(SE $\frac{1}{4}$)	" "	"	12 x 7/1.5
		FCR -- disintegrating cobble -- <u>pot boiler?</u>	friable granite	max, ca, 80
		<u>grindstone fragment</u>	basalt	44x25x73
	0-10 cm	large round nail	white chert	14/18/3.5
	(SW $\frac{1}{4}$)	tertiary flake	" "	13/8/1.6
		" "	quartz	max. 24
		shatter	basalt	
		<u>grindstone fragment</u>	3 basalt, 1 granite	
		4 FCR fragments		
	10 cm	<u>grindstone fragment</u> (at S.35, E.68)	basalt	
	10-20 cm	tertiary flake	red/orange chert	21/11/2
	(NW $\frac{1}{4}$)	" " fragment	quartz	
		" " "	"	
		shatter (3 pieces)	"	max. 9,10 & 10
		2 FCR fragments	basalt	
		FCR or shatter	quartz	
		5 burnt bone fragments	unidentifiable	

FT 3	10-20 cm (NE 1/4)	tertiary flake	grey chert	9/6/1.3
		" "	quartz	8/8/2.5
		" " fragment	"	
		retouch/rejuvenation flake	"	5/5/1
		decortication shatter	"	max. 14
		shatter	"	max. 13
		4 FCR fragments	basalt	
		8 burnt bone fragments	1 antler, rest un-	
		9 charred seed fragments	identifiable	
		4 charcoal specks	unidentifiable	
10-20 cm (SE 1/4)		tertiary flake	grey "moss" silica	11/12/1.6
		" "	grey chert	12/12/2.1
		" "	reddish brown chert	13/14/3
		" "	white quartzite	6ap/11/2
		" "	quartz	7/11/1.7
		" "	basalt	16/18/2
		" "	"	13/10/1.4
		" "	"	25/33/7.3
		" " fragment	"	
		shatter	Tongue River Silica	max. 23
		" (3 pieces)	quartz	max. 12,13,16
		"checked" piece	quartz	45x35x25
		FCR -- disintegrating cobble -- <u>pot boiler?</u>	friable granite	ca. 80 max. width
		10 burnt bone fragments	unidentifiable	
		5 charcoal specks		
10-20 cm		tertiary flake	grey chert	6ap/5/1.5
		" "	reddish brn chert	23/15/2.5
		retouch/rejuvenation flake	greyish brown "	5/4/0.9
		shatter	quartz	max. 18
		4 FCR fragments	basalt	
		2 " "	friable granite	
		9 burnt bone fragments	unidentifiable	
		3 charred seed fragments	"	
		4 charcoal specks		
20-25 cm (NW 1/4)	(all but retouch/rejuv. flake found <u>in situ</u> , as plotted on plan view map)	tertiary flake	grey chert	8/9/1.8
		" "	mottled tan/white	17/24/6.7
		" "	chert	
		" "	quartz	12ap/8/2
		" "	"	9x8/2
		" "	basalt	8ap/9/1.8
		retouch/rejuvenation flake	siltstone	5ap/5/0.8
		decortication shatter (2 pieces)	quartz	max. 26 & 32
		shatter (2 pieces)	"	max. 8 & 9
		<u>grindstone fragment</u>	basalt	
		<u>grindstone fragment</u>	granite	
		8 burnt bone fragments	unidentifiable	
		2 charred seed fragments	"	

FT 3	20-25 cm (NE½)	(all but asterisked items found <u>in situ</u> , as plotted on plan view map)		
		tertiary flake	jasper taconite	13/8/1.5
		" "	grey chert	9/6/1.4
		retouch/rejuvenation flake*	orange quartzite	5/6/1.1
		<u>grindstone fragment</u>	basalt	
		<u>grindstone fragment</u>	friable granite	
		2 FCR fragments	basalt	
		5 burnt bone fragments*	unidentifiable	
		5 charred seed fragments*	"	
		2 charcoal fragments -- possible recent -- not kept		
	20-25 cm (SE½)	(all but two burnt bone fragments found <u>in</u> <u>situ</u> , as plotted on plan view map)		
		decortication flake	basalt	11/16/2.5
		tertiary flake	brown silica (KRF?)	16/11/1.2
		" "	grey chert	9/7/1.1
		" "	siltstone	13/12/1.9
		<u>grindstone fragment</u>	basalt	
		5 FCR fragments (same cobble)	basalt	
		3 " " " "	friable granite	
		4 burnt bone fragments	unidentifiable	
	20-25 cm (SW½)	(all but asterisked items found <u>in situ</u> , as plotted on plan view map)		
		tertiary flake	tan silica	12/10/1.4
		" "	brown chert	10/5/0.9
		" "	" "	10/10/1.3
		" "	" "	8ap/6/0.7
		" " *	tan chert	8/5/0.8
		retouch/rejuvenation flake*	grey chert	6x4/0.6
		shatter	quartz	max. 10
		FCR fragment -- very small -- <u>possibly off</u> <u>a grindstone</u> -- very smooth & flat exterior	basalt	
		FCR fragment, possibly also off a <u>grind-</u> <u>stone</u> , for same reasons	granite	
		FCR fragment	basalt	
	25-30 cm (NW½)	(all but a few of the burnt bone fragments recorded <u>in situ</u> and plotted on plan view)		
		decortication flake	quartz	24x20/5
		tertiary flake	siltstone	28ap x 28ap/2.8
		" "	grey chert	8ap/6/0.9
		" " fragment	orange agate	
		3 " " " s	quartz	
		retouch/rejuvenation flake	red quartzite	7ap/5/1.2
		" " "	grey chert	7/7/1.2
		" " "	" "	7/7/1.2
		decortication shatter	grey/white chert	max. 19
		6 FCR fragments	1 granite, 5 basalt	
		7 burnt bone fragments	unidentifiable	

FT 3	25-30 cm (NE½)	(all but smallest quartz flake and 1 burnt bone fragment found <u>in situ</u> and plotted)			
		tertiary flake	jasper taconite	10ap/9/1.5	
		" " fragment	" "		
		2 " " " s	quartz		
		shatter	"	max. 15	
		<u>grindstone fragment</u>	basalt		
		3 FCR fragments	"		
		12 burnt bone fragments	unidentifiable		
		4 charcoal fragments from darker stain along central N wall			
	25-30 cm (SE½)	(all but asterisked flakes and most of the burnt bone fragments recorded <u>in situ</u>)			
		<u>crude side scraper</u> made on decortication flake	chert	75x60/16	
		tertiary flake	grey chert	12/14/2.7	
		" "	jasper taconite	17/17/2.5	
		" "	siltstone	27/24/6.5	
		" "	agate	9/9/2.5	
		" " fragment*	clear quartz		
		retouch/rejuvenation flake*	jasper taconite	8x5/0.7	
		decortication shatter	quartz	max. 14	
		shatter	variegated red & grey chert	max. 28	
		"checked" piece	brown silica	25x15x8	
		3 FCR fragments	2 friable granite		
			1 basalt		
		12 burnt bone fragments	mostly unidentifiable		
	25-30 cm (SW½)	(all but the smallest five flakes and a small burnt bone fragment recorded <u>in situ</u>)			
		tertiary flake and fragment of same material	light brown silica	15/8/0.8	
		" " " " " " "	jasper taconite	12ap/10/1.5	
		" "	" "	9/9/1.2	
		" " fragment	jasper		
		" "	quartz	21x14/2.6	
		2 " " " s	"	max. 8 & 10	
		retouch/rejuvenation flake	black chert	4/5/0.9	
		" " "	brown "	7/6/0.9	
		" " "	quartz	5/6/1.1	
		" " "	tan chert	6x4/0.6	
		shatter (2 pieces)	quartz	max. 13 & 14	
		decortication shatter (2 pieces)	jasper taconite	max. 24 & 30	
		FCR -- cobble with heat induced discoloration and partly damaged exterior	granite		
		FCR fragment	granite		
		burnt bone fragment	unidentifiable		

FT 3 30-40 cm (all but a few bone fragments recorded <u>in situ</u> and plotted with depth indications -- hence no differentiation between 30-35 cm and 35-40 cm in this list)			
(NW½)	crude biface	basalt	70ap/96/24
	decortication flake	basalt	52/48/14
	tertiary flake	tan-grey chert	17/11/2.2
	" " fragment	reddish chert	
	decortication shatter	grey silica	max. 22
	" "	quartz	max. 23
	shatter (2 pieces)	"	max. 10 & 14
	6 burnt bone fragments	unidentifiable	
	2 charcoal fragments		
(NE½)	decortication flake with retouch	"curly" jasper	22ap/28/15.2
	tertiary flake	siltstone	22/24/3.5
	" "	"	11ap/11/3.3
	decortication shatter (2 pieces)	quartz	max. 12 & 36
	shatter	"	max. 16
	FCR fragment	basalt	
	chunk of reddish pigment (ochre?)		max. 28
	9 burnt bone fragments	mostly unidentifiable	
(SE½)	thin biface made from tertiary flake	white chert	20ap/16/4.2
	tertiary flake fragment	jasper taconite	
	" " "	" "	
	tertiary flake	siltstone	18/16/2
	" " "	"	
	2 " " " s	quartz	max. 10
	shatter (2 pieces)	"	max. 14 & 16
	FCR fragment	friable granite	
	concentration of curved, thin bones	identifiable	
	16 burnt bone fragments	unidentifiable	
(SW½)	tertiary flake	grey silica with darker inclusions	21x12/4.3
	" "	quartz	11/18/4.5
	2 " " fragments	"	
	shatter	"	max. 18
	FCR fragment	basalt	
	7 burnt bone fragments	unidentifiable	
	8 beaver incisor fragments		
40-50 cm		unidentifiable	
(NE½)	3 burnt bone fragments		
(SE½)	decortication flake	reddish chert	14x18/5
	burnt bone fragment	unidentifiable	
(SW½)	tertiary flake	quartz	36/16/6
	burnt bone fragment	unidentifiable	

Appendix E: Locational Information for
Test Units

Areas C and D, 6/10-11/85

- ST1 Located right on a line extended due E from the Mon.1/16 Corner. Measuring W from ST1, reached point 1 m due N of ST2 at the 11 m mark, crossed E edge of old road at 24 m mark and edge of woods at 33-34 m. Measuring due E from ST1, reached W edge of new road at 5.5 m mark, E edge of same at 11.5 m, E edge of terrace at 18 m and swampy lakeshore at 27.5 m.
- ST2 11 m W of ST1 and 1 m S of 1/16 line.
- ST3 15 m S of #2 along line extended S at 177°.
- ST4 " " " " #3 " " " " " "
- ST5 " " " " #4 " " " " " "
- ST6 " " " " #5 " " " " " " and 11 m W of edge of new road.
- ST7 " " " " #6 " " " " " " " 9 " " " " " " "; also 3 m E of E edge of old road and E edge of the woods.
- ST8 10 m E of #5 and 4 m W of edge of new road; also S of ST1 at 177°.
- ST9 15 m S of ST1 at 180° and 5 m W of W edge of blacktop on new road.
- ST10 15 m due N of ST1 and 5 m " " " " " " " " "
- ST11 30 m E of ST8 at 88° and 9 m E of E edge " " " " " ". Also 4 m W of upper edge of slope to lake and ca. 13.5 m W of lake.
- ST12 15 m S of ST11 at 184° and 8 m W of edge of upper slope to lake and ca. 17 m W of shore.
- ST13 15 m S of ST12 at 188°.
- ST14 15 m S of ST13 at 190°.
- ST15 15 m S of ST14 at 197°. Also 13 m N of beginning of riprap along shore and E edge of new road and ca. 20 m N of point where Area D terrace peters out.
- ST16 10 m E of ST14, 4 m W of upper edge of slope and ca. 22 m W of lake.
- ST17 10 m E of ST13, " " " " " " " " " " 13 " " " "
- ST18 15 m N of ST11 at 357° and 6.5 m E of blacktop on new road.
- ST19 15 m N of ST18 at 351° " 4 " " " " " " ; also ca. 2 m from beginning of slope to lake and 11 m W of lakeshore.
- ST20 30 m due N of ST19 (too much slope at 15 m mark).

Area A, 8/1-2/85

- ST21 From Station II to ST21: 15 m at 112°.
- ST22 " " " " ST22 4 " 67°.
- ST24 " " " " ST24 15 m ' 56°.
- ST23 From ST24 to ST23, 9 m at 109°
- ST25 From ST23 to ST25 13.5 m at 39°
- ST26 From ST25 to ST26, 8 m at 11°.
- ST27 From ST26 to ST27, 11 m at 352°

From ST27 to ST11, 11.5 m at 342°.
 From ST11 to ST8, 2.5 m at 298°
 From ST11 to ST12, 4.5 m at 320°.
 From ST12 to ST10, 10 m at 310°.
 From ST10 to ST9, 3 m at 234°.
 From Station I to center of old white pine, 9.5m at 49°.
 From " " to ST20, 24.5 m at 77°.
 From " " to ST21, 35.5 m at 71°.
 From " " to ST22, 46.5 m at 68°.
 From ST21 to ST22, 11 m at 72°.
 From ST22 to ST23, 24 m at 60°.
 From ST23 to ST24, 11 m at 59°.
 From ST24 to NE edge of mowed area, 1.5 m at 60°.
 From Station II to ST19, 12 m at 24°.
 From ST19 to ST18, 22 m at 266°.
 From ST18 to ST17, 28 m at 254° (between tent sites #6 and 7).
 From ST17 to ST15, 34.5 m at 282° (just off NW corner of tent site #9).
 From ST15 to ST16, 15 m at 117°.
 From ST15 to ST14, 17 m at 264°.
 From ST14 to ST13, 16 m at 329°.

Area C, 8/20-21/85

ST47 21.5 m W of W corner of maintenance shed at 275°, and 12 m NE of river bank and 6 m E of edge of woods.
 ST48 22 m S-S/SE of ST47 at 166°, 5 m from road, 3 m from upper river bank.
 ST49 15 m " " of ST48 at 154°, 10 m " " 5.5 m " " "
 ST50 16 m SE of ST49 at 146°.
 ST51 44 m SE of ST49 (not ST50) at 146°, on crest of S end of cemetery ridge.
 ST52 14.5 m E-E/SE of ST51 at 104°.
 ST53 15 m NE of ST52 at 39°, on gentle E/SE slope of ridge, 7.5 m SE of the southwestern of the flag poles.
 ST54 16 m from ST51, backsighting at 227°.
 16 m from ST52, " at 160°.
 ST55 30 m NW of ST54 at 320°, also 14 m from ST50 at 215°.

- ST56 16.5 m N/NE of NE corner of maintenance shed at 20° and 22.4 m from NW corner of northward extension of residence at 314° .
- ST57 13.8 m from ST56 at 325° .
- ST58 12 m N of NE corner of fence around sewage treatment plant, at 11° . Also ca. 5 m in from upper part of steep river bank.
- ST59 On lower terrace, 4 m from edge of woods and 4 m in from eroding river bank (ca. 1.5 m above river level).
- ST60 20 m N/NE of original NE corner of northward extension of residence (before adding of porch), at 20° . On slope NE of residence at what appears to be the original upper part of the river bank (before the latter was extended northward), with more than 40 cm of fill over the original surface.
- ST62 8 m N/NE of Mon 1/16 Corner at 5° .
- ST61 20 m NE/E of " " " at 59° .

Appendix F: Description of Ceramic Evidence

Rim and Neck Sherds#1 Rim Sherd (ST 51:0-20 cm)

Straight rim profile, flattened lip; 7.8 mm thick at lip, 7 mm below.
 Decoration: 4 mm wide cordwrapped stick (CWS) impressions, all vertical, 7 S-twists/cm, barely 3 impressions/2 cm segment, on smoothed exterior.

Medium to large grit-temper (g.t.), well fired; hardness of 4 on the Moh scale.

Exterior coloring: dark reddish brown (5YR 3/2-3/4); interior and core: reddish brown (5 YR 4/3-4/2).

Cultural affiliation: probably Blackduck.

#2 Rim Sherd (FT5:10-15 cm)

Straight rim profile, flat, thickened lip; lip 11 mm thick, rim 7mm.
 Decoration: 3 mm wide, oblique CWS impressions on lip and smoothed exterior (6 Z-twists/cm, 3 impressions/2 cm).

Medium g.t. and well fired ware; hardness of 4 on the Moh scale.

Exterior: brown (7.5 YR 5/4-4/2). Core and interior: brown (7.7 YR 4/2).

Cultural affiliation: Blackduck.

#3 Rim Sherd (FT5:10-15 cm)

Straight profile, somewhat thickened, flattened lip; 5.3 mm thick at lip, 4.5 mm below.

Decoration: Carelessly executed cord impressions on exterior, with scattered, irregular CWS impressions (too irregular to warrant measuring).

Medium g.t. and hardness of 3 on the Moh scale.

Exterior and interior: reddish brown (5 YR 5/4-4/3). Core: dark reddish gray (5 YR 4/2).

Cultural affiliation: Late Woodland/Late Prehistoric, possibly Sandy Lake.

#4 Rim Sherd (FT6:10-15; ST 52:10-20)

Straight rim profile and flattened, thickened lip; lip 9.5 mm thick, rim 6 mm.

Decoration: Oblique, 4 mm wide CWS impressions (6 S-twists/cm and 3 impressions/2 cm).

Medium to coarse g.t. and hardness of 4 on the Moh scale.

Exterior and interior: dark brown (7.5 YR 3/2). Core: less dark brown (7.5 YR 4/2-4/4).

Cultural affiliation: Blackduck.

#5 Six Neck Sherds (ST 52:10-20 cm; FT6:0-10 and 10-15 cm)

Straight profile, 4-4.5 mm thick.

Decoration: Parallel rows of 1.5 mm wide CWS/comb impressions with dragging by same implement between (6-7 CWS twists or teeth/cm and 5 impressions/2 cm).

Fine g.t. and hardness of 4 on the Moh scale.

Exterior: brown (7.5 YR 5/4). Core and interior: brown to dark brown (7.5 YR 5/4 to 4/2).

Cultural affiliation: Early Blackduck? See under #8.

#6 Neck Sherd Fragment (ST 52:10-20 cm)

Slightly outcurved profile, 4.8 mm thick.
 Surface treatment: vertical combing.
 Fine g.t. and hardness of 4 on the Moh scale.
 Exterior>core>interior: dark brown (7.5 YR 3/2).
 Cultural affiliation: probably Late Woodland.

#7 Rim Sherd (FT 6: 0-10 cm)

Slightly outcurved rim profile; flat, barely thickened lip; lip is 6.2 mm thick, rim 5.5 mm.
 Decoration: Smoothed over, oblique above horizontal CWS impressions and punctates on the exterior (too faint for measurements to be taken); horizontal combing on the interior.
 Fine g.t. and hardness of 4 on the Moh scale.
 Exterior>core>interior: dark reddish brown (5YR 3/3 to 4/4).
 Cultural affiliation: Late Woodland, precise identification impossible.

#8 Five Rim Sherds (FT 6:0-10 and 10-15 cm)

Straight rim profile; flat, slightly thickened lip; lip 5.5-5.8 mm thick, rim 4.4 mm.
 Decoration: Oblique, 1.5 mm wide CWS/comb impressions on lip and rim exterior (at same intervals as in #5), with straight, vertical dragging of same implement in between.
 Other characteristics same as those for neck sherds described as #5 -- #8 possibly the rim of the same vessel.
 Cultural affiliation: Early Blackduck, with many similarities to St. Croix Stamped.

#9 Neck Sherd (FT 6:0-10 cm)

Straight profile, 6.5 mm thick.
 Decoration: Rather indistinct horizontal comb/narrow CWS impressions (6 twists/cm; 4-5 impressions/2 cm) over vertical combing.
 Fine g.t. and hardness of 4 on the Moh scale.
 Exterior>interior: dark reddish gray to reddish brown (5 YR 4/2 to 3/2).
 Cultural affiliation: Early Blackduck (certain St. Croix Stamped features).

#10 Two Rim Sherds (FT 6:0-10 and 10-15 cm)

Somewhat outcurved rim profile with flat, unthickened lip; lip 4.1-4.5 mm thick, rim 4.5 to 5 mm.
 Decoration: Oblique, 4 mm wide CWS impressions on lip and upper rim exterior (6-7 Z-twists/cm, 4 impressions/2 cm) and punctates (at least 1 cm apart) just below; entire exterior vertically combed, interior smooth.
 Fine g.t. and hardness of 3.5 on the Moh scale.
 Exterior >interior: reddish brown (5 YR 5/4-4/4).
 Cultural affiliation: Blackduck.

#11 Lower Rim/Neck Sherd (FT 6:10-15 cm)

Straight rim profile; rim-neck angle 150°; rim 6.6 mm thick, neck 5.7 mm.

Decoration: On lower rim, 3 horizontal rows of 2-2.5 mm wide CWS impressions (5 Z-twists/cm, 5-6 impressions/2 cm); lunate indentations made by hollow implement (bone or reed?) in rim/neck angle; somewhat oblique, rather indistinct cord impressions on neck.

Quite coarse g.t. and hardness of 3-3.5 on the Moh scale.

Exterior>interior: brown (7.5 YR 5/4 to 4/4).

Cultural affiliation: probably Blackduck.

#12 Rim Sherd (ST 53:0-10 cm)

Straight, everted rim, flat, unthickened lip; 5.3-5.5 mm thick.

Decoration: Oblique CWS impressions on lip and upper rim exterior. above horizontal CWS impressions with 2.5 mm wide punctates at 8 mm intervals on lower rim; CWS impressions 2.5 mm wide, with 6 Z-twists/cm and 4 impressions/2 cm.

Medium to coarse g.t. and hardness of 4 on the Moh scale.

Exterior>interior: dark reddish gray (5 YR 4/2).

Cultural affiliation: Blackduck.

#13 Rim Sherd (ST 1:10-20 cm)

Straight, everted rim profile; thickened, flat lip; lip 9-9.5 mm thick, rim 6 mm.

Decoration: Oblique, deep, 4 mm wide CWS impressions on lip and rim exterior (5-6 S?-twists/cm and 3½ impressions/2 cm). Horizontal CWS and punctates on neck.

Medium to coarse g.t. and hardness of 3.5 on the Moh scale.

Exterior: brown to strong brown (7.5 YR 5/4-6 to 4/2). Core and interior: dark brown (7.5 YR 4/2-4).

Cultural affiliation: Blackduck.

#14 Rim Sherd (ST 1:30-40 cm)

Straight, somewhat everted rim profile with thickened, flat lip; lip 9 mm thick, rim 5.3 mm.

Decoration: Oblique, shallow, ca. 3 mm wide CWS impressions (fine cord) in lip as well as rim interior and exterior (9-10 S?-twists per cm and 4 impressions per 2 cm segment).

Medium to coarse g.t. and hardness of 4 on the Moh scale.

Exterior>interior: dark reddish gray to reddish brown to dark reddish brown (5 YR 4/2-3 to 3/2).

Cultural affiliation: Blackduck.

#15 Neck Sherd (ST 1:40-50 cm)

Almost straight, 5 mm thick.

Decoration: 3-3.5 mm wide, irregular and widely spaced CWS impressions in oblique and horizontal rows (4-5 S-twists/cm and max. 3 impressions/2 cm).

Medium to coarse g.t. and hardness of 3.5 mm on the Moh scale.

Exterior>interior: reddish brown to dark reddish gray (5 YR 5/3 to 4/2-3).

Cultural affiliation: Onamia or careless Blackduck.

#16 Neck Sherd (FT 2:10-20 cm)

Straight profile, 6.3 mm thick.

Decoration: Punctates on vertically brushed exterior and loosely wound, widely spaced CWS impressions on interior (scattered, 2-3 "twists"/cm, 3 rows/3 cm segment).

Medium to coarse g.t. and hardness of 3 on the Moh scale.

Exterior and interior: reddish brown (5 YR 5/4). Core: dark reddish gray (5 YR 4/2).

Cultural affiliation: Onamia or Blackduck.

#17 Neck(?) Sherd (FT2:20-25 cm)

Slightly outcurved profile, 6.7 mm maximum thickness.

Surface treatment: Combed and irregularly cord marked exterior -- too small to determine patterning.

Medium to coarse g.t. and hardness of 3.5 to 4 on the Moh scale.

Exterior: dark reddish gray to dark reddish brown (5 YR 4/2 - 3/2).

Core and interior: dark reddish gray (5 YR 4/2)

Cultural affiliation: cannot be determined.

#18 Neck Sherd (FT 2:30-40 cm)

Slightly outcurved profile, 6.1 mm maximum thickness.

Decoration: 1.5-2 mm wide comb or CWS impressions in oblique and horizontal rows (6 imprints/cm and 2½ impressed rows/2 cm).

Fine to medium g.t. and hardness of 3-3.5 on the Moh scale.

Exterior and interior: reddish brown (5 YR 5/3 to 5/2). Core: dark reddish gray (5 YR 4/7)

Cultural affiliation: Early Blackduck continuum (some characteristics shared with St. Croix Stamped).

#19 Neck(?) Sherd (ST 41:20-30 cm)

Straight profile, 9.5 mm thick.

Decoration: stamped decoration made by hollow, tube-like implement on smooth exterior.

Vessel made by coiling -- two coil-breaks visible.

Medium g.t. and hardness of 3 on the Moh scale.

Exterior>interior: light reddish brown to reddish yellow (5 YR 6/4 to 6/6).

Cultural affiliation: Middle Woodland -- probably Malmo (or Laurel) related.

Body Sherds

A. (ST 51:0-20 cm; FT 5:10-15 cm; 3 and 1 sherds resp.)

Smooth exterior and interior; 5.3-6.6-7.7 thickness range.

Coarse g.t. -- much white quartz.

Somewhat friable texture, hardness of 3.

Exterior: yellowish red (5 YR 5/6 - 4/6). Core and interior: darker reddish brown (5 YR 4-3/3-4).

B. (ST 51:0-20 cm; FT 5:10-15 cm; 1 sherd in each)

Smoothed cord markings on exterior, smooth interior.

5.5 - 5.7 thickness range.

Mostly fine g.t. with some large grains (not white quartz).

Well fired, hardness of 3.5.

Exterior>interior: brown to strong brown (7.5 YR 5/4 to 5/6).

C. (ST 51:0-20 cm; FT 5:0-20; 4 and 7 sherds respectively)

Deep, narrow cord markings, irregularly applied on exterior; interior smooth; 3-4.5 mm thickness range.

Mostly fine g.t. with occasional large grit (not white quartz).

Hardness of 3. Solid texture, well fired.

Exterior: reddish brown to yellowish red (5 YR 5/4 to 5/6) to brown

- strong brown (7.5 YR 5/4 to 5/6) with blotches of red (2.5 YR 5/6).

Interior and core: reddish brown to brown (5 YR 5/4 to 7.5 YR 5/4).

D. (ST 51: 0-30, 5 sherds)

Smoothed cord markings on exterior, smooth interior; 2.9-4 mm thickness range.

Small grit/sand temper.

Well fired, hardness of 4.

Exterior: reddish brown (5 YR 5/4 to 4/4). Core and interior: dark reddish gray to reddish brown (5 YR 4/2 to 3/2).

E. (ST 51: 0-20 cm; FT 5:0-10 cm; 5 and 1 sherds respectively)

Cord marked exterior, smooth interior; 3.8-5 mm thickness range.

Medium to coarse g.t. with some distinct quartz grains.

Well fired, hardness of 4.

Exterior: dark reddish gray to dark reddish brown to reddish brown

(5 YR 4/2, 4/3 and 3/2). Interior: very dark gray to dark reddish

gray to dark reddish brown (5 YR 3/1, 3/2 and 4/2). Core somewhat lighter than the above.

F. (ST 52: 10-20 cm; 3 sherds)

Irregular, partly smoothed cord markings on exterior; smooth interior and 3.4 to 7 mm thickness range (mostly 4-4.5 mm).

Fairly large g.t. -- much white quartz.

Well fired, hardness of 3.5 to 4.

Exterior: brown (7.5 YR 5/4). Core and interior: brown to dark brown (7.5 YR 5/4 to 4/2).

G. (ST 52:10-20 cm; FT 6:10-15 cm, 4 sherds in each)

Irregular cord markings on exterior, smooth interior; 4.3-6 mm thickness range.

Medium to large dark colored g.t.

Well fired, hardness of 4.

Exterior>interior: brown to dark brown (7.5 YR 3/2 to 4/2).

H. (FT 6:0-10 cm, 2 sherds)

Cord marked exterior, smooth interior.

Thickness: 4.5 mm. Well fired, hardness of 3.5.

Medium g.t.

Exterior>interior: reddish brown (5 YR 5/3 to 4/3).

I. (ST 53:0-20 cm and ST 54:20-30 cm, 3 and 1 sherds respectively)

Widely spaced, partly smoothed over cord markings on exterior, smooth interior. Thickness 4.2-4.5 mm.

Medium to fine g.t.

Well fired, hardness of 3.5.

Exterior: brown (7.5 YR 5/4). Core: dark brown (7.5 YR 4/2). Interior: brown to dark brown (7.5 YR 5/4 to 4/2).

J. (ST 1:10-20 cm; ST 10:50-60 cm)

Smoothed cord markings on exterior, smooth interior; 5.6 mm thick.

Medium to coarse g.t.

Well fired, hardness of 3.5 to 4.

Exterior>interior: brown to dark brown (7.5 YR 5/4 to 4/2).

K. (ST 1:20-40 cm, 2 sherds)

Smoothed cord markings on exterior, smooth interior; 6.8 mm thick.

Medium to coarse g.t.

Well fired, hardness of 4.

Exterior>interior: reddish brown (5 YR 5/4).

L. (ST 1:30-40 cm; ST 10:50-60 cm, 1 sherd in each)

Cord marked exterior, smooth interior. Thickness: 4.6 mm.

Fine g.t.

Well fired, hardness of 4.

Exterior: dark gray to dark reddish gray (5 YR 4/1 to 4/2). Core and interior: dark to very dark gray (5 YR 4/1 to 3/1).

M. (ST 1:40-50 cm; ST 10:30-40 and 50-60; FT 2:20-25, 1 sherd from each)

Very distinct cord markings on exterior, smooth interior.

Thickness 5.5 mm.

Fine to medium g.t.

Well fired, hardness of 4.

Exterior: brown (7.5 YR 5/4 to 4/2). Core and interior: brown to dark brown (7.5 YR 4/2).

N. (ST 2:10-20 cm; ST 9:20-30 cm; ST 10:20-30 cm; 1,8 and 1 sherds resp.)

Irregular, somewhat smoothed cord markings on exterior; smooth interior. Thickness: 5.1 mm.

Medium g.t.

Well fired, hardness of 4.

Exterior: reddish brown (5 YR 5/3 - 5/4 and 4/3 - 4/4). Core and interior: dark reddish gray to very dark gray (5 YR 4/2 to 3/1).

O. (ST 2 Extension:10-20 cm; ST 10:50-60 cm, 1 sherd in each)

Partly smoothed cord markings on exterior, smooth interior. 4.8 mm.
 Medium to coarse g.t.
 Well fired, hardness of 3-3.5.
 Exterior>interior: reddish brown (5 YR 5/3 to 5/4).

P. (ST 4:10-20, 1 sherd)

Very distinctly cord marked exterior, smooth interior; 6.5 mm thick.
 Medium to large, dark g.t.
 Well fired, hardness of 3.
 Exterior: brown to strong brown (7.5 YR 5/4 to 5/6). Core: brown to dark brown (7.5 YR 4/2 to 5/2). Interior: reddish yellow to strong brown (7.5 YR 5/6 to 6/6).

Q. (ST 8:10-20 cm, 2 sherds)

Smooth exterior and interior. Thickness 8.7 mm.
 Medium to very coarse g.t. Fairly well fired, hardness of 3 to 3.5.
 Exterior: yellowish red to reddish brown (5 YR 5/6 to 4/3). Core and interior: dark reddish gray to reddish brown (5 YR 4/2 to 4/3).

R. (ST 10:30-40 cm, 1 sherd)

Somewhat smoothed cord markings on exterior, smooth interior. Thickness: 6.3 mm.
 Medium, dark colored g.t.; well fired; hardness of 3.5.
 Exterior: brown (7.5 YR 5/4). Core and interior: mottled brown - dark brown - very dark gray (7.5 YR 5/4, 4/4 and 3/0).

S. (ST 10:50-60 cm, 4 sherds)

Smooth exterior but with possible smoothed cord markings in one corner; smooth interior. Average thickness: 7 mm.
 Medium g.t.; well fired; hardness of 3.5 to 4.
 Exterior: reddish brown (5 YR 5/3 to 5/4). Core and interior: reddish brown to dark reddish brown (5 YR 5/4 to 4/3 to 3/2).

T. (ST 10:50-60 cm, 1 sherd)

Cord markings and row of small round depressions on exterior, smoothed cord markings on interior -- possibly, in fact, a neck sherd.
 Medium, dark colored g.t.; well fired; hardness of 4.
 Exterior and core: very dark gray to reddish brown (5 YR 3/1 to 3/2).
 Interior: black (5 YR 2.5/1).

U. (FT 2:10-40 cm, 14 sherds; FT 4:0-30 cm, 9 sherds)

Very smoothed cord markings on exterior, plain interior. Thickness: 5-6.1.
 Temper, color and hardness similar to neck sherd #16. Probably same vessel.

V. (ST33 & 34: 20-30 cm, 2 sherds)

Cord marked exterior, smooth interior. Thickness ca. 5 mm. Medium size grit temper. Well fired, hardness of 3.5. Exterior > interior: brown (2.5 YR 5/4).

Appendix G: Curatorial Arrangements

January 30, 1984

To whom it may concern:

Christina Harrison, independent Archaeological contractor, has contracted with Hamline University Anthropology University Anthropology laboratory for accessioning of all artifactual materials and data retrieved in the process of her work.

Accessioning and curation of these materials will conform to the standards established by Hamline University Anthropology laboratory. A copy of these standards is enclosed.

Sincerely,



Barbara H. O'Connell
Assistant to the State Archaeologist
Assistant Professor

BHO:mc



DEPARTMENT OF SOCIOLOGY AND ANTHROPOLOGY

ST. PAUL, MINNESOTA 55104

Ladies and Gentlemen:

Hamline University is offering artifact processing and storage as a curation service for Minnesota archeological collections. The facilities and services include:

- temperature-and humidity-controlled storage
- secured storage areas, protected against fire and theft
- modern artifact processing facilitated by ultrasonic cleaning .
- permanent labeling of artifacts and artifact groups (India ink with lacquer permanization)
- storage facilities for final reports.

Two types of services are available at Hamline:

1. curation only, and
2. artifact processing and curation.

The policies governing the processing of artifacts and their documentation are designed to comply with the suggestions of the Council of Museum Anthropology in its 1977 report. We feel that these policies must be complied with to assure adequate documentation and security of collections that are placed under Hamline's care. The policies are:

Artifact storage materials. All artifacts will be stored in plastic ziplock bags with Mylar cards in permanent ink included as labels. Diagnostic lithics and fragile items will be stored individually in plastic bags with packing material if necessary. Items too small to be numbered will be stored in plastic vials with paper labels included.

Drawer storage will include adequate cushioning-corrugated cardboard-to prevent damage from tumbling of items. (Collections that Hamline curates will comply with these storage specifications).

Reports. All materials that are processed and/or curated will be accompanied by a final report of their recovery. Detailed location and descriptive information regarding the artifactual material should be included in this report. Any materials that are judged to be part of a site that has received a state number should be accompanied by this number. State site numbers should be solicited and acquired before artifact processing begins.

Loans and Viewing of Collections. Hamline will approve reasonable requests from professionals to view the collections it curates. Such viewing will be limited to the premises of the Anthropology Laboratory, and will be supervised. (The donor institution is an exception to this.) For security reasons, the removal of collections from the laboratory is not encouraged. It will be permitted with the approval of the donor, provided all costs of processing, packaging, and transportation are paid by the donor institution. All collections leaving the laboratory must be insured. Hamline assumes no responsibility for collections that leave the laboratory with the donor's approval.

All requests for viewing of collections must be submitted at least one week in advance, and are subject to the availability of personnel in the laboratory.

Paper documentation. Catalog records and final reports will be accessible to professionals with the permission of the donor institution. Such information can be duplicated at a reasonable rate at Hamline. Cost of duplication and processing will be charged to the individual or institution that requests the documents.

Artifact group documentation. All artifact groups (bags or other groupings) must be accompanied by information regarding:

- state site # if any
- date of recovery
- individual(s) who recovered items
- specific vertical location of items (surface, excavation level, etc.)
- specific horizontal location of items (usually related to parameters given in final report)

A master list of all artifact groups must also accompany the collection.

Catalog records. Hamline will develop paper catalog records for all artifacts that are processed by the laboratory. (Collections that are curated only are not included in this policy). Catalog records will consist of documentation of:

lithic material--composition (chert, quartz, etc.) and color (10 standard designations related to Munsell's color designations).

ceramic material-- surface treatment (i.e., smooth, cord-roughened), location on vessel (rim, body sherd, etc.) and temper.

organic material--nature of material--bone, seed, charcoal, etc.

Such designations will be made according to standards established by the Hamline laboratory, which consist of comparative collections of items. These reference materials will be on view for inspection by donor institutions. Hamline does not encourage any analysis performed without inspection of the artifacts themselves. The laboratory is not liable for any conclusions drawn from catalog records. Items that are too small or degraded to be adequately described will be enumerated only.

Appendix H: Resumes

VITA

Christina Inger Gotesdotter Harrison (Haglund)

Current: Director, Archaeological Research Services
2637 Humboldt Avenue South #3
Minneapolis, MN 55408
(612) 374-4571

Education:

1969 M. Phil. Degree
University of London, Institute of Archaeology
London, England

Research in England, Sweden, Finland and the USSR,
1966-1968, focused on the reconstruction of
prehistoric trade and other forms of culture contact
and, in particular, on the use of quantitative
chemical analysis of metal, ground stone, amber, and
wood artifacts for such reconstruction. Results
presented and discussed in a thesis titled:
Connections between Scandinavia, Russia and the
British Isles from the Late Neolithic to the Early
Iron Age.

1963- Internal M. Phil. Candidate, Institute of Archaeology,
1965 London, England.

Courses in: European, Asian and African Prehistory
(Professors J.D. Evans, R. Hodson, J. Sheldon,
T.S. Sulimirski, F. Zeuner); Physical Anthropology
and Paleontology (Professor I. Cornwall);
Environmental Archaeology and Pleistocene Geology
(Professors F. Zeuner, I. Cornwall and G.
Dimbleby); Archaeological Field and Conservation
Technique (Professors H. Hodges and I. Gedy);
Prehistoric Technology (Professor H. Hodges);
Archaeological Draughtsmanship and Cartography;
Cultural Anthropology (Professor P. Ucko).

1961 Cand. Phil. Degree
University of Upsala, Sweden (attended 1958-61)
Majors: German Language and Literature (Honors),
History and Theory of Art
Minors: European Prehistory (Honors), Cultural
Anthropology (Honors)

Scholarships and Grants:

- 1967 University of London Central Research Fund Travel
 Grant (for research carried out in the USSR)
- 1964- British Council Overseas Scholarship
1965

Teaching Positions:

- 1977- Taught in the Minnesota Archaeological Society
1979 (MAS) and Council of Minnesota Archaeology (CMA)
 Certification Program in Archaeology through the
 Extension Division at Hamline University, St. Paul,
 Minnesota. Courses: Archaeological Laboratory
 Techniques, Archaeological Survey Methods and
 Archaeological Field Methods.
- 1977 Assistant Professor, Anthropology, Extension Division,
 Mankato State University, Minnesota. Course:
 Archaeological Field Techniques--part of the same
 certification program shown above.
- 1976- Assistant Professor, Anthropology, Extension Division,
1977 University of Minnesota, Minneapolis, MN. Courses:
 North American Archaeology, Introduction to
 Prehistory, Principles of Social and Cultural
 Anthropology, Old World Prehistory.
- 1974- Instructor (part-time), Department of Sociology and
1976 Anthropology, St. Olaf College, Northfield, MN.
 Courses: The Emergence of Man, Cultural Anthropology,
 Native Americans Yesterday and Today, Directed
 Research.
- 1973- Directed two sessions of the Archaeological Summer
1974 Institute at Carleton College, Northfield, MN; each
 included 5 weeks of field school followed by 3 weeks
 of laboratory analysis and interpretation of excavated
 data and site features.
- 1971- Visiting Assistant Professor, Department of
1973 Anthropology, University of Minnesota, Minneapolis.
 Courses: Paleoanthropology, Old World Prehistory,
 Method and Theory in American Archaeology, Field
 Methods in Archaeology, Arctic Archaeology, Directed
 Studies
- 1970- Instructor, Department of Sociology and

- 1971 Anthropology, Carleton College, Northfield, MN.
Courses: Physical Anthropology, Archaeological Method
and Theory, Old and New World Prehistory, Cultural
Anthropology.

Archaeological Field Experience: *

- 1984 Participated in a cultural resource survey of the
shores of the Pindari Dam Reservoir, NSW, Australia,
for the Water Resources Commission of NSW, April.

Directed intensive testing (for National Register
evaluation) of sites 21-AN-29 and 30, Rice Lake
Estates, Anoka Co., for the Zack Johnson Group, Maple
Grove, MN.

Directed further intensive testing (National Register
evaluation and mitigation respectively) on sites 21-
BE-44, Blue Earth Co., MN, and 21-SL-165, St. Louis
Co., MN, both for the Bureau of Land Management,
Eastern States Office.

Conducted a cultural resource reconnaissance survey of
proposed undertakings on Chippewa National Forest,
Beltrami, Cass and Itasca Co., MN, for the U.S. Forest
Service, during July-September.

Performed a cultural resource reconnaissance survey of
proposed developments within Sherburne National
Wildlife Refuge (NWR), Swan Lake Waterfowl Production
Area (WPA), Tamarac NWR and Maple Lake WPA (located in
Sherburne, Kandiyohi, Becker and Polk Co.,
respectively, MN). For the U.S. Fish and Wildlife
Service, during July and August.

Performed a cultural resource reconnaissance survey
along two transmission lines proposed for Wirt-
Alvwood, Itasca Co., and Dickinson-Crow River, Wright
Co., MN for the United Power Association, Elk River,
MN, during October-November.

Also conducted Phase I cultural resource surveys for:

Anoka County Parks - proposed recreational lake
developments within Coon Rapids Dam Regional Park,
Coon Rapids, MN.

City of Lindstrom, Chisago Co., MN, proposed
developments within Beach Park.

* For 1985-1987 projects, see pages 13 and 14.

City of Maple Grove, Hennepin Co., MN, proposed developments within Elm Creek Special Use Park.

City of Chanhassen, Hennepin Co., MN, proposed boat access within Lake Ann Park.

City of Grand Meadow, Mower Co., MN, proposed wastewater treatment plant expansion.

Land Development Group, Inc., Burnsville, MN, proposed housing development (Creek Ridge), in City of Savage, Scott Co., MN.

Render Development, Inc., Bloomington, MN, proposed Deer Run housing development, City of Savage, Scott Co., MN.

City of Madelia, Watonwan Co., MN, Watonwan River stabilization project.

Wright Co., MN, proposed developments within Beebe Lake Regional Park.

1983 Directed a reconnaissance survey and subsequent intensive testing on that part of 21-AN-24 which falls within the "Woods of Golden Lake" development area, Circle Pines, Anoka Co., MN; field work performed at various times during March-April, 1983. Final reports were submitted on April 6 and June 15, 1983 to James Lund Construction, Inc., Anoka, MN.

Directed a perimeter survey of archaeological site 21-BE-44, Blue Earth County, MN, for the Bureau of Land Management, Eastern States Office. Field work performed during May-June. More intensive testing (for National Register evaluation and mitigation of acute erosion problems) was performed during September-October.

Performed a Class III field inventory survey of select public domain tracts in Minnesota (Koochiching, Pine and St. Louis Counties) for the Bureau of Land Management (Eastern States Office) during May-June. Subsequently performed intensive testing of site 21-SL-065 (located during the Class III survey) for the purpose of National Register evaluation.

Performed two intensive archaeological field surveys for U.S. Fish and Wildlife Service: one within the Boot Lake Waterfowl Production Area (WPA) Jackson County, MN, the other within the Tatley Lake WPA, Clay County, MN, (July and November, respectively).

Directed Phase I cultural resource reconnaissance surveys for:

City of Eagle Lake, Blue Earth Co., MN, of proposed wastewater transporting facility.

City of Ceylon, Martin Co., MN, proposed wastewater treatment facility.

City of Lindstrom, Chisago Co., MN, same as the above.

Washington Co. Planning Department, MN, series of proposed collector drainfields.

Rock County Highway Department, MN, proposed extension of existing landfill.

Village of N. Hudson, St. Croix Co., WI, proposed developments within Ferry Landing Park.

1982 Directed a cultural resource survey of proposed undertakings on the Chippewa National Forest, MN, during September-November, 1982.

Directed a Phase II cultural resource investigation of Middle-Late Woodland deposits within County Lakes Park, City of Lino Lakes, Anoka Co., MN, May-June, 1982.

Performed Phase I cultural resource surveys for:

City of Carver, Carver Co., MN, proposed wastewater treatment facility.

City of Menasha, Wadena Co., MN, proposed wastewater treatment facility.

City of Lynd, Lyon Co., MN, proposed wastewater treatment facility.

City of Emmons, Freeborn Co., MN, proposed wastewater treatment facility.

City of Maple Grove, Hennepin Co., MN, housing development.

Meadow Lakes Corporation, Maple Grove, Hennepin Co., MN, housing development.

- 1981 Participated in a cultural resource survey of the Kerrabee Dam Project, NSW, Australia, for the Water Resources Commission of NSW, during March and April.
- Performed a cultural resource reconnaissance survey on the sites of the "Creek Bend Condominiums" and "Donnay's Creek View Hills - 2nd addition" developments, Hennepin Co., for Suburban Engineering, Inc., Minneapolis, August 1981.
- Directed a cultural resource survey of proposed undertakings on the Chippewa National Forest, MN, during September-November 1981.
- 1980 Participated in cultural resources survey of area of proposed open cut mining, for Ulan Coal Mines Limited, NSW, Australia. during March 1980.
- Performed Phase I cultural resource surveys for/in/of:
- Nicollet County, MN, proposed developments within Seven Mile Creek Park.
 - Rochester Park and Recreation Department, Olmsted Co., MN, proposed development, within Zumbro and Essex Parks.
 - Grant Co., MN, proposed developments within Lightning Lake Park.
 - Village of Stoddard, Vernon Co., WI, proposed wastewater treatment facility.
 - City of Stewartville, Olmsted Co., MN, proposed wastewater treatment facility.
 - Minnesota Department of Natural Resources, Section of Hay Creek Channel, Featherstone Twp., Goodhue Co., MN, proposed for habitat improvements.
 - City of Alpha, Martin Co., MN, proposed wastewater treatment facility.
 - Northfield Industrial Park Associates, Inc., Northfield, Rice Co., MN, proposed Commercial/Light Industrial Corridor.

Minnesota Department of Natural Resources, proposed boat launching/car parking facility in Hok-Si-La Municipal Park, Goodhue Co., MN.

City of Millerville, Douglas Co., MN, proposed wastewater treatment facility.

Directed a cultural resource survey of proposed undertakings on the Superior National Forest, MN, for the Forest Service, during August-October, 1980.

- 1979 Performed a series of small scale cultural resource inventory and impact assessment surveys for the following:

Arrowhead Electric Cooperative, Inc., Lutsan, MN, proposed powerline ROW;

Drummond State Bank, Barnes, Bayfield Co., WI, proposed new facility;

City of Maple Grove, Hennepin Co., MN, proposed developments within Weaver Lake community park;

City of Northfield, Rice Co., MN, proposed developments within Sechler Park;

Village of Colfax, Dunn County, WI, proposed wastewater treatment facility.

Directed a cultural resources survey of proposed undertakings on the Superior National Forest in Cook, Lake and St. Louis counties, MN, for the USDA-Forest Service during August-November, 1979.

- 1978 Directed the "Minnesota Historical Society Statewide Survey: Dakota-Goodhue Counties," April-June, 1978.

Directed a cultural resource survey within parts of the Agassiz and Tamarac National Wildlife Refuges, MN, for the USDI-Fish and Wildlife Service, May, 1978.

Directed a cultural resources survey of the Superior National Forest in Cook, Lake and St. Louis Counties, MN, for the USDA-Forest Service, July-August, 1978.

Directed further test excavation of a site in the Tamarac National Wildlife Refuge, in order to assess the cultural significance of the site as a guide to future management; performed during November 1978 for the U.S. Fish and Wildlife Service.

Directed the "Minnesota Historical Society Statewide Survey: Kanabec-Pine Counties," September-November, 1978.

- 1978 Performed a cultural resources survey and test excavation at Circle Pines, Anoka Co., MN, for Golden Lake Partnership, Inc., May 1977.
- Directed excavations at the Silvernale Site (21 GD 3), run as a fieldschool for the CMA-MAS Certification Program in Archaeology, June-July, 1977.
- Directed the "Minnesota Historical Society Statewide Survey: Anoka-Isanti Counties," September-December, 1977.
- 1976 Directed excavation at the Silvernale Site (21 GD 3), in Goodhue Co., MN, during April-July 1976 - a project carried out in cooperation with members of the Council for Minnesota Archaeology and the Minnesota Archaeological Society.
- Participated as Field Director in the cultural resource inventory survey of the shoreline of Lake Winnibigoshish, Itasca and Cass Counties, MN, for the U.S. Army Corps of Engineers, July-September, 1976. Principal Investigator: Dr. Eldon Johnson, University of Minnesota, Minneapolis.
- Performed a cultural resource inventory survey in the Chippewa National Forest, Itasca Co., MN, for the USDA-Forest Service, October-November 1976.
- 1975 Performed a cultural resource survey of the Control Data Recreational Area, St. Croix River, for the Control Data Corporation, November 1975.
- Performed a cultural resource survey at the Nett Lake Indian Reservation, St. Louis Co., for the Nett Lake Indian Reservation, during November 1975.
- Performed a cultural resource survey of the Boman Marina Project, Koochiching Co., for the U.S. Army Corps of Engineers, November 1975.
- 1974 Participated in a cultural resource survey along the proposed corridor of a transcontinental pipeline during the month of March in NSW, Australia. Director: Dr. L. Calley, National Parks and Wildlife Service of NSW.
- 1973-1974 Submitted a proposal for an Archaeological Summer Institute at Carleton College, Northfield, MN, during Fall 1972. Directed the first two sessions of this program during July and August of 1973 and 1974, which involved excavation and survey in Rice and Goodhue Co., MN, followed by laboratory analysis, curating, and interpretation of the data.

- 1972 Directed the University of Minnesota Archaeological Field School at Rice Lake State Park, MN, June-July 1972.
- 1968 Participated as an Assistant Field Director in the excavation of an aboriginal burial ground at Broadbeach, Queensland, Australia, during August-September, 1968. Director: Dr. L. Haglund, University of Queensland.
- 1966- Carried out museum and library research in England,
1967 Sweden, Finland and the USSR.
- 1962- Worked as Assistant Field Director for Riksantikvarie-
1963 ambetet (Ministry of Antiquities), Sweden, in the excavations at Overuman, Swedish Lapland, during July-September, 1962 and July-September, 1963.
- 1961 Participated in excavations at the Bronze Age Cemetery of Dragby, Upsala, Sweden, during May-June, 1961. Director: Professor Marten Stenberger, University of Upsala, Sweden.
- 1960- Participated in excavations at the Neolithic and
1961 Bronze Age Site in Gwithian, Cornwall, England, during the summers of 1960 and 1961. Director: Professor Charles A. Thomas, University of Edinburgh.

Other Professional Experience:

- 1970- Guest lectured on aspects of Midwestern or Old World
1983 Prehistory to a variety of academic, layman and public school audiences (a partial listing would include Carleton College, Northfield, MN, Hamline University, St. Paul, Mankato State University, University of Minnesota, American Institute of Archaeology, Rockford, IL chapter, Minnesota Archaeological Society, Twin Cities Chapter, as well as various county historical societies and public schools around Minnesota).
- 1977 Designed and assembled an exhibit on "Daily Life at the Mississippian Sites of the Red Wing Area" for Goodhue County Historical Society, Red Wing, MN.
- 1973 Designed and assembled an exhibit on "The Prehistory of the Cannon River Valley," for Carleton College, Northfield, MN.
- 1965- Drafted maps and illustrations of artifacts for
1966 various archaeological reports.

- 1964 Translated archaeological literature from German into English for Thames and Hudson: London (see further under Publications and Reports).

Publications and Reports (brief survey reports excluded): *

- 1985 A Cultural Resource Survey of Proposed Undertakings on Chippewa National Forest, Beltrami, Cass and Itasca Counties, Minnesota. Submitted to the U.S. Forest Service during March, 1985. Under preparation for publication: Final reports on two excavations conducted for the Bureau of Land Management, Eastern States Office, at 21-BE-44, Blue Earth County, MN and at 21-SL-165, St. Louis County, MN.

- 1984 Report on an Archaeological Intensive Field Survey of Tract 106, Parcel A, Tatley Lake Waterfowl Production Area, Clay County, Minnesota. Performed on November 2-4, 1983. Submitted to U.S. Fish and Wildlife Service 1/6/84.

Report on Intensive Testing of Prehistoric Sites 21-AN-23 and 21-AN-30, Located Within Proposed Rice Lake Estates Development, Lino Lakes, Anoka County, Performed During May, 1984. Submitted to the Zack Johnson Group, Architects and Planners, Maple Grove, MN on 6/4/1984.

Report on a Cultural Resources Reconnaissance Survey Along the Right-of-Way of the Proposed United Power Association Transmission Line Between Alvwood and Wirt, Itasca County, MN. Performed October 23-26, 1984. Submitted to the United Power Association, Elk River, MN, 11/16/84.

Report on Archaeological Surveys at Sherburne National Wildlife Refuge (Sherburne County), Swan Lake Waterfowl Production Area (Kandiyohi County), Tamarac National Wildlife Refuge (Becker County) and Maple Lake Waterfowl Production Area (Polk County), MN. Performed during July-August, 1984. Submitted to U.S. Fish and Wildlife Service 11/25/84.

* For 1985-1987 project reports, see pages 13 and 14.

- 1983 Report on Intensive Archaeological Testing on that Part of 21 AN 24 which Lies within the Proposed "Woods of the Golden Lake" Development, Circle Pines, Anoka County, Minnesota, April-May, 1983, submitted June 15, 1983 to James Lund Construction Inc., Anoka, MN.
- Report on a Class III Intensive Field Inventory of Select Public Domain Tracts in the State of Minnesota Proposed for Public Sale in Fiscal Year 1984.
 Submitted to Bureau of Land Management, Eastern States Office, 7/14/83.
- Report on a Sample Archaeological Intensive Field Survey of Boot Lake Waterfowl Production Area, Litchfield Wetland Management District, Jackson Co., MN, performed on July 8-9 and August 8-10, 1983.
 Submitted to U.S. Fish and Wildlife Service 8/19/83.
- 1982 An Archaeological Phase II Investigation Within the Country Lakes Park, City of Lino Lakes, MN, May-June, 1982, submitted to the City of Lino Lakes on June 27, 1982.
- A Cultural Resource Survey of Proposed Undertakings on Chippewa National Forest, Beltrami, Cass and Itasca Counties, MN, submitted to the U.S. Forest Service during May, 1982.
- 1981 A Cultural Resource Survey of Proposed Undertakings on the Superior National Forest, Lake, Cook, and St. Louis Counties, MN, submitted to the U.S. Forest Service, February 1981.
- 1980 A Cultural Resource Survey of Proposed Undertakings on the Superior National Forest, Lake, Cook, and St. Louis Counties, MN, submitted to the U.S. Forest Service, January 1980.
- 1979 The Prehistory of Kanabec and Southern Pine Counties: An Archaeological Survey of the Snake River Region.
 St. Paul: Minnesota Historical Society.
- The Prehistory of Dakota and Goodhue Counties: An Archaeological Survey of the Cannon River Region. St. Paul: Minnesota Historical Society.
- The Prehistory of Anoka and Isanti Counties: An Archaeological Survey of the Anoka Sandplain. St. Paul: Minnesota Historical Society.

- 1978 Section on the Mississippian Cultural Tradition in Red Wing, Minnesota, Saga of a River Town, by M. Angell; Red Wing: Goodhue County Historical Society.

Report on the Test Excavations Carried out on the Blackbird Trail #2 Site, 21 BK 28, During October-November, 1978; submitted to the U.S. Fish and Wildlife Service, Twin Cities, MN.

A Cultural Resources Survey of the Superior National Forest, Cook, Lake and St. Louis Co., MN.

Report on the Archaeological Survey Carried Out in the Agassiz and Tamarac National Wildlife Refuges, Minnesota, on May 5-9, 1978; submitted to U.S. Fish and Wildlife Service, Twin Cities, MN.

- 1977 Sections of Cultural Resources Inventory of Lands Adjacent to Lake Winnibigoshish; submitted to the U.S. Army Corps of Engineers, St. Paul District.

Report on the Archaeological Survey Carried out in the Chippewa National Forest, Compartments #84 and 85, during October-November, 1976. Submitted to the U.S. Forest Service, Cass Lake, MN.

- 1969 Connections Between Scandinavia, Russia and the British Isles; M. Phil. Thesis, University of London, England.

- 1964 Translation of The Art of Mesopotamia, from the German original Mesopotamia by Eva Strommenger, (300 pp.) for Thames and Hudson: London, England.

Publications in preparation:

The Silvernale Site: A Mississippian Village at the Cannon Junction

The Redepenning Collection: A Study of the Prehistory of the Cloquet River Basin, Minnesota

Professional Organizations:

Society for American Archaeology
Council for Minnesota Archaeology
Minnesota Archaeological Society
Manitoba Archaeological Society
Ontario Archaeological Society

1985 Projects

Phase I (Cultural Resource Reconnaissance Surveys) for:

City of Plymouth, MN.
Exemplar Inc., Minneapolis, MN.
City of Taylors Falls, MN.
Minnesota Power Company, Little Falls, MN.
Young and Wilz Architects, Minneapolis, MN.
H. Kuusisto, Consulting Engineers, St. Paul, MN.
Larkin, Hoffman, Daly and Lindgren, Attorneys at Law, Bloomington, MN.

U.S. Fish and Wildlife Service, Twin Cities, MN: three separate projects (Halls Lake Waterfowl Production Area [WPA], Sherburne National Wildlife Refuge, Tonn and Latham Exchanges in Freeborn, Sherburne and Stevens Counties respectively; Rosendale WPA and J. Schaff Tract, Meeker County and Marysville WPA, Wright County; Chippewa Valley WPA in Douglas County).

U.S. Forest Service, Chippewa National Forest -- various cultural resource investigations related to 85-86 undertakings on the Forest.

Phase II (National Register Evaluations) for:

U.S. Army Corps of Engineers, at site 21 AK 11 on Big Sandy Lake Reservoir in Aitkin County, MN.

U.S. Forest Service, Chippewa National Forest, at site 21 CL 36, on Pike Bay, Cass County, MN.

1986 Projects

Phase I Investigations for:

City of St. Michael, MN.
Cities of Nisswa, Lakeshore and East Gull Lake, MN.
H.E. Homes, Inc., Brooklyn Center, MN (mapping of 21 HE 17 in City of Bloomington, MN).

McComb-Knutson, Inc. Plymouth, MN, (investigations in Pierce County, WI).

U.S. Forest Service, Chippewa National Forest, MN -- various compliance surveys.

U.S. Fish and Wildlife Service, Twin Cities, MN -- various compliance surveys on WPAs in Kandiyohi, Meeker and Stearns Counties, MN.

Phase III Investigation (Mitigation) for:

H.E. Homes, Inc., Brooklyn Center, MN -- formal excavations at site 21 HE 17, City of Bloomington, MN.

U.S. Forest Service, Boise National Forest, Idaho -- participant in stabilization/restoration of historic log structure on Middle Fork Salmon River, Idaho.

Archival Research/ Documentation of Standing Structures for:

U.S. Forest Service, Chippewa National Forest, MN -- Level II documentation of Walker Fire Tower, City of Walker, MN.

U.S. Forest Service, Chippewa National Forest, MN -- cultural resources overview and thematic study of Euro-American settlement within the Forest.

1987 Projects (through 07/87)

Phase I Investigations for:

City of Mapleton, MN

Advance Developers Corporation, Burnsville, MN, and Brandt Investments, Inc., Edina, MN -- investigations at 21 HE 17, City of Bloomington, MN.

Minnesota Department of Natural Resources, Division of Fish and Wildlife -- surveys related to proposed construction projects at Sarah Creek, Hennepin County, and Lake Ida, Douglas County, MN.

U.S. Fish and Wildlife Service, Twin Cities, MN -- various project related investigations on WPAs in Jackson, Kandiyohi, Meeker and Stearns Counties, MN.

Phase II Investigation for:

U.S. Fish and Wildlife Service, Twin Cities, MN -- National Register evaluation of site 21 SN 16, Stearns County, MN.

Curriculum Vitae

JAMES EUGENE MYSTER

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Education

University of Minnesota College of Liberal Arts
Bachelor of Arts, Anthropology, awarded December 1984
Main concentration on Anthropological Archaeology
Total G.P.A. 3.45 Major G.P.A. 3.79

Senior Project

"Late Prehistoric Site Location Analysis on Lake Winnibigoshish
and Leech Lake, North Central Minnesota"
-an unpublished manuscript
Elden Johnson; Advisor

Archaeological Field Experience

July to Sept
1984

Excavator
Unnamed (21-MO-20), Little Falls, MN
-a wooden French trading post occupied in the mid 1700's
Douglas A. Birk, Institute for Minnesota Archaeology; Principal
Investigator

June 1984

Surveyor
1984 Red Wing Survey Project, Red Wing, MN
-a comprehensive and extensive archaeological survey of the
area within the Red Wing Corporate limits
Clark A. Dobbs, Institute for Minnesota Archaeology; Principal
Investigator

April to Sept
1983

Excavator
Bryan Site (21-GD-4), Red Wing, MN
-a large Mississippian Oneota Indian village occupied between
900 and 1300 A.D.
Dr. Clark A. Dobbs, Institute for Minnesota Archaeology;
Project Director

April to May
1982

Field School
Historic Fort Snelling (21-HE-99), St. Paul, MN
-a limestone American Army fortification occupied from the
1820's into the early 1900's
Robert A. Clouse, Minnesota Historical Society; Principal
Investigator and Dr. Guy E. Gibbon, University of
Minnesota; Project Director

Archaeological Laboratory Experience

- Jan to Present 1985 Research Assistant
Institute for Minnesota Archaeology
-Organize data collected from the 1983 Bryan Archaeological Project and 1984 Red Wing Survey Project. Structure and implement an overall plan for data processing and analysis. Enter data into a comprehensive computer database system. Supervise and direct volunteers. Cartography.
Dr. Clark A. Dobbs, Institute for Minnesota Archaeology; Project Director
- Sept to Dec 1984 Volunteer
Minnesota Historical Society Conservation Laboratory
-chemical and mechanical restoration, preservation, and conservation of metal artifacts excavated from Historic Fort Snelling (21-HE-99)
Charles Diesen, Minnesota Historical Society; Advisor
- Sept 1983 to May 1984 Undergraduate Research Assistant
University of Minnesota, Bryan Archaeological Project
-cleaning and cataloging of artifacts and computer entry of data from the 1983 excavation of the Bryan Site (21-3D-4)
Dr. Clark A. Dobbs, Institute for Minnesota Archaeology; Project Director
- Jan to March 1983 Intern
Minnesota Historical Society
-literature search, cataloging, seriation, distributional mapping of tableware excavated from Historic Fort Snelling (21-HE-99)
-unpublished manuscript: "Fort Snelling Tableware: a knife, fork and spoon stylistic analysis"
Dr. Janet D. Spector, University of Minnesota and Robert Clouse, Minnesota Historical Society; Advisors

Research Interests

- The formation of soils and sediments, the chemical, biological, and mechanical processes occurring within each, how cultural disturbance affects these processes, and inversely, how these processes affect artifacts and ecofacts after their deposition.
- The preservation and restoration of archaeological material in both the field and the laboratory as an essential part of the material's life from deposition through excavation to conservation and storage.
- The ability of intrasite spatial and temporal distributions of archaeological structures, features, and artifacts to reflect possible human behavioral patterns in regard to cultural infrastructures.

Celtic anthropology of Western Europe during the Bronze and Iron Ages before extensive Roman and Viking influence, specifically of Ireland and Northern Scotland. Possible research methods include: comparable ethnoarchaeological studies, modern anthropological interpretation of Celtic and Roman manuscripts, detailed scientific excavation, and careful laboratory analysis.

Future Plans

Graduate School somewhere in the United States or the United Kingdom, entering the Fall of 1986. Until then: individual study, career focus, writing, field and lab work -- all in preparation to entrance.

references furnished upon request

april 1985

Marcia Helen Regan

[PII Redacted]

Education: Hamline University, St. Paul, MN
B.A. May 1985
Magna cum laude with honors in anthropology
Major: Anthropology
GPA: 3.87 (4.0 scale)

Experience: Summer 1982 Archaeological field school, Little Rapids site (21-Sc-27) with Dr. Janet Spector, U of M, and Dr. Barbara O'Connell, Hamline University. Courses:
Field Techniques Grade: A
Lab Techniques Grade: A

8/82 - 5/84 Student worker, Hamline University Anthropology Lab and Minnesota State Archaeologist's Office

Summer 1983 Crew member on field crew, the Bryan site (21-Gd-4) near Red Wing, MN. Dr. Clark Dobbs, supervisor.

May 1984 Crew member, 21-An-23 and 21-An-30, contract excavation. Christina Harrison, supervisor.

5/84 - now Research Assistant, Minnesota State Archaeologist's Office. Duties include maintaining and updating the State Site Files, curating and accessioning archaeological and osteological collections, analyzing osteological data and writing reports.

June 1984 Crew member, 21-SL-165. Contract excavation. Christina Harrison, supervisor.

August 1984 Field supervisor for salvage excavation of prehistoric Indian burial area near Lakefield, MN. Dr. Barbara O'Connell, Asst. State Archaeologist, supervisor.

8/84 - 9/84 Crew member, 21-Mo-20. Research excavation of historic French fur trade post near Little Falls, Mn. Douglas Birk, Institute for Minnesota Archaeology, supervisor.

Nov. 1984 Crew member, 21-Be-44, contract excavation. Christina Harrison, supervisor.

2/85 - 5/85 Teaching assistant for Dr. Barbara O'Connell's Human Evolution class. Duties included correcting labs, answering students' questions, and conducting class lab sessions when Dr. O'Connell was gone.

Honors: Graduated Magna cum laude with honors in anthropology
Phi Beta Kappa 1983
Kappa Phi 1983
Pi Gamma Mu 1983
Torch and Cycle 1983
Academic Dean's List 1981, 1982, 1983, 1984
Belle and Leland Cooper award for outstanding senior anthropology major, 1984
Awarded a National Science Foundation Graduate Fellowship to begin Fall, 1985.

References: References will be furnished upon request.

vita

PII Redacted

SUSAN M. THURSTON

EDUCATION

Hamline University
Bachelor of Arts, Anthropology, awarded May, 1984
Main concentration in Physical Anthropology and Archaeology
G.P.A. 3.74

ARCHAEOLOGICAL EXPERIENCE

Contract work for Minnesota State Archaeologist's Office and Private Contractors

November
1984

Excavator
Daley Park Island (21-BE-44), Mapleton, MN
Woodland; define geographical boundaries of
ceramic complex
Christina A. Harrison, Private Contractor,
Principal Investigator

September
1984

Excavator
Unnamed (21-NI-47), North Mankato, MN
Middle Woodland linear mound grouping
Dr. Christy A. H. Caine, Minnesota State Archae-
ologist, Principal Investigator

August, September
1984

Excavator
Kolander Farm Burials (no site number), Windom, MN
Prehistoric bundle burials, salvage excavation
Dr. Barbara H. O'Connell, Assistant Minnesota State
Archaeologist, Principal Investigator

August - September
1984

Excavator
Murphy's Inn (21-SC-31), Shakopee, MN
Historical steamboat landing and inn, occupied
1850's - 1960's
Susan McCanna, Principal Investigator, funded by a
grant from the Minnesota Historical Society

Field School

June - July
1984

Sandy Lake Post (21-AK-4), McGregor, MN
Northwest Company Fur Trade Post, occupied 1795 -
1842
Dr. Guy Gibbon, University of Minnesota, Principal
Investigator

ARCHAEOLOGICAL LABORATORY EXPERIENCE

September - present 1984 -	Research Assistant Minnesota State Archaeologist's Office Curate, accession and analyze archaeological and osteological collections, write osteological reports, maintain and update state site files, preliminary archaeological survey and salvage excavation of threatened sites, respond to inquiries of interest from general public Dr. Barbara H. O'Connell, Assistant Minnesota State Archaeologist, Director
January - May, 1984 February - present, 1985	Private Researcher Osteobiographic analysis of 186 Mimbres Phase skeletons. Analyses include: determination of age, sex, race, stature; description of evident pathologies; osteometric and odontometric measurement Dr. Barbara H. O'Connell, Advisor
September, 1983 - May, 1984	Undergraduate Research Assistant Hamline University and Minnesota State Archaeologist's Office Curate, accession, and analyze archaeological and osteological collection, write osteological reports, general office duties

RESEARCH PAPERS AND PROJECTS

1984	"Dental Asymmetry in a Prehistoric Mimbres Phase Population in Southwestern New Mexico"
1983	"The Discovery of Dakota Indian Seasonal Camps and Their Interpretation Using Ethnographic Resources"
1983	"Fossil Hominid Interpretation"
1982	"Computers in Archaeology"
1982	"Paleopathology: Differential Diagnosis"

RESEARCH INTERESTS

The study of human adaptation in prehistory. Special interests: determination of nutritional and environmental stressors; determination of the level of stress humans can adapt to; determination of biological adaptations to different ecosystems, such as high altitude, arid lands, arctic zones, and grasslands; measurement of biological indicators of stress such as osteo- and odontometric asymmetry and paleopathology; and gender variation in adaptation to stress.

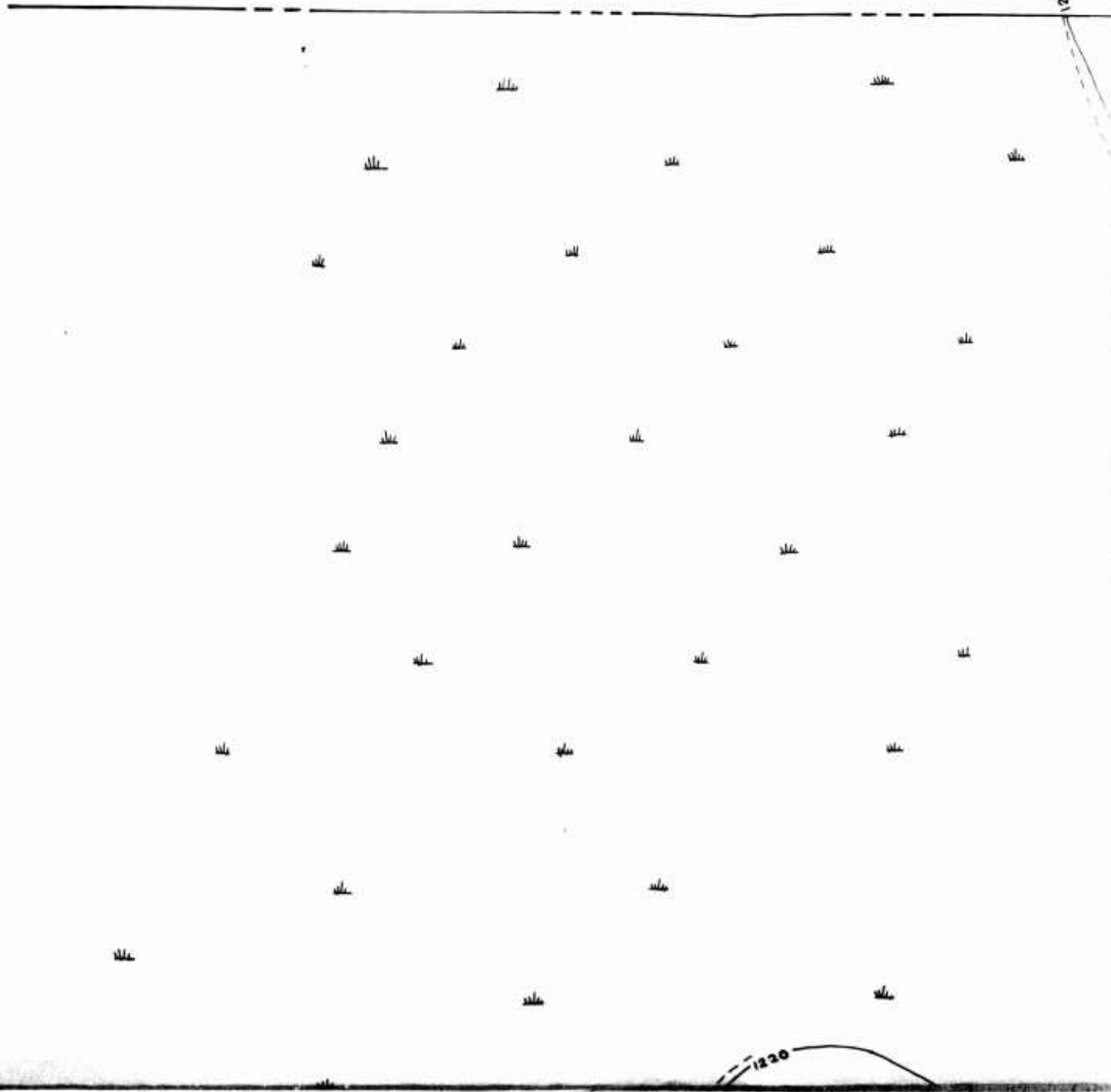
Archaeological excavation in general as a means to assessing the cultural context of biological processes leading to stress and subsequent adaptation to that stress. Special interests: gender and social organization in the archaeological record as an indicator of who is most likely to experience stress and paleoethnobotany - diet and nutrition in relation to stress.

References furnished upon request

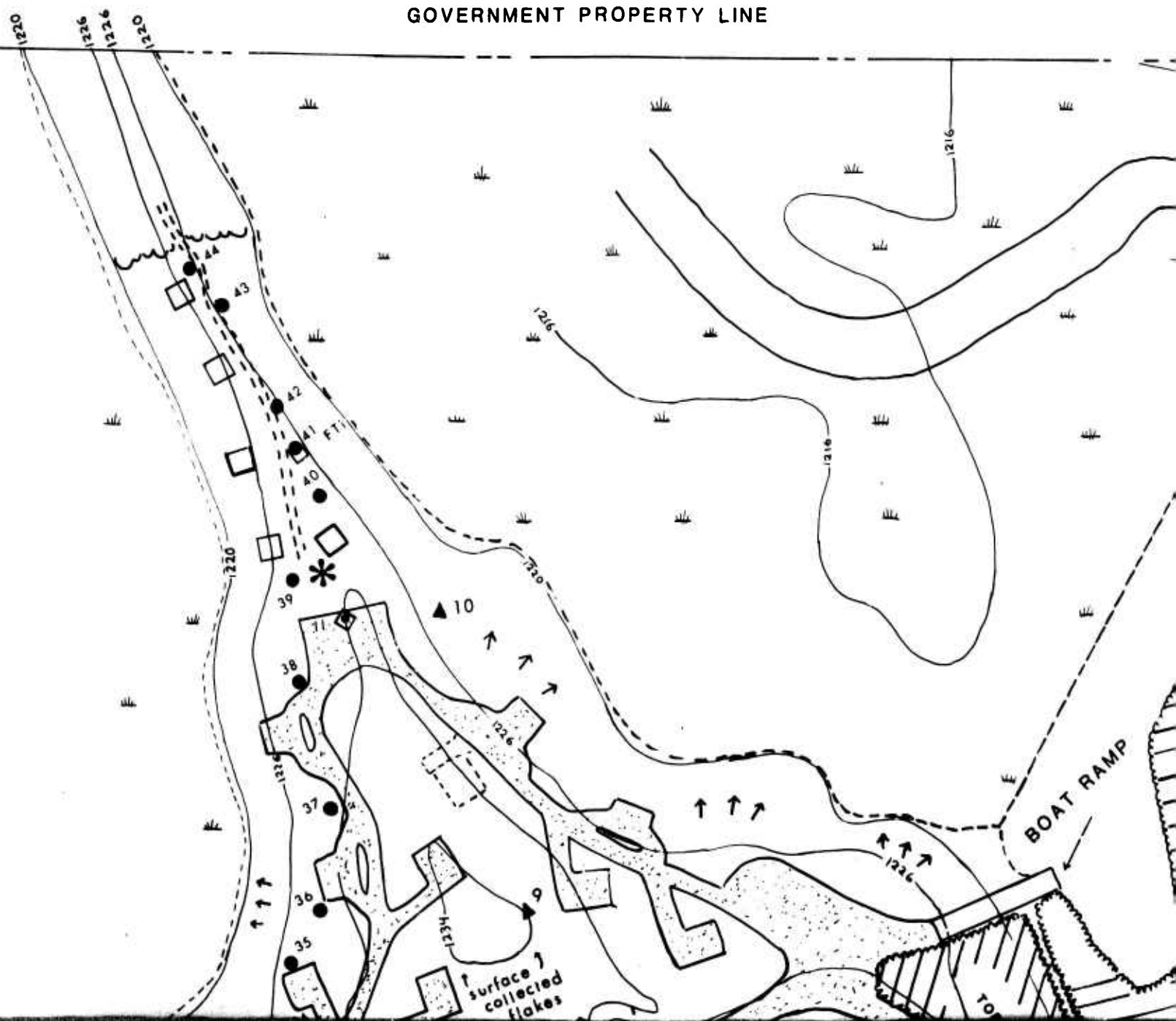
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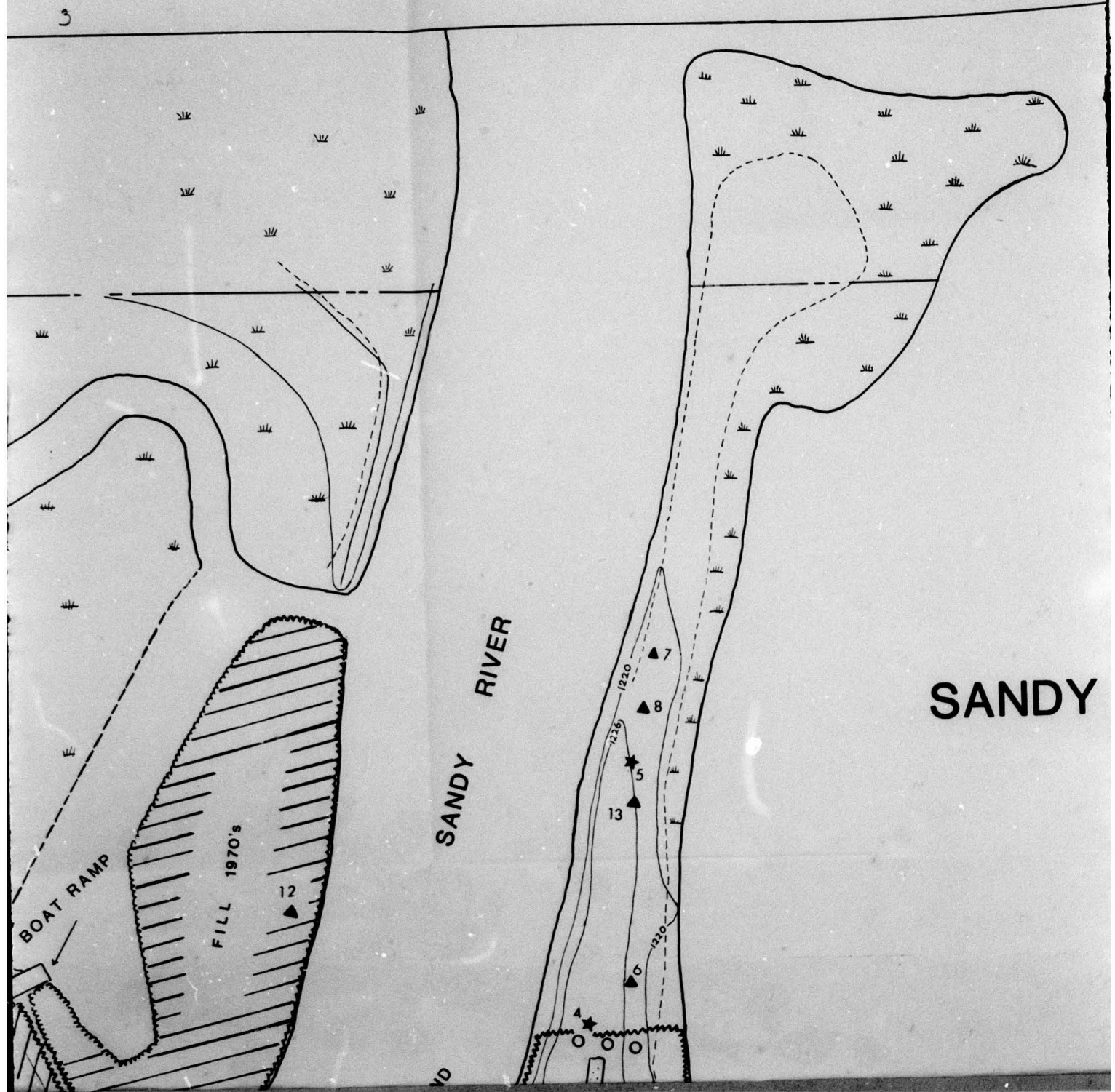
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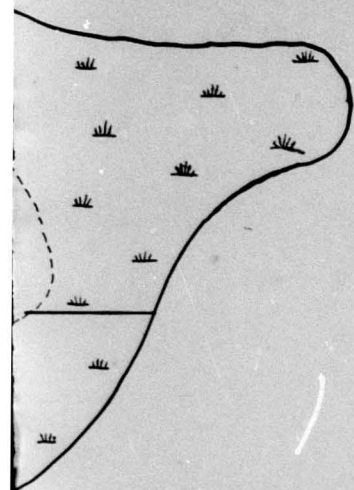


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41

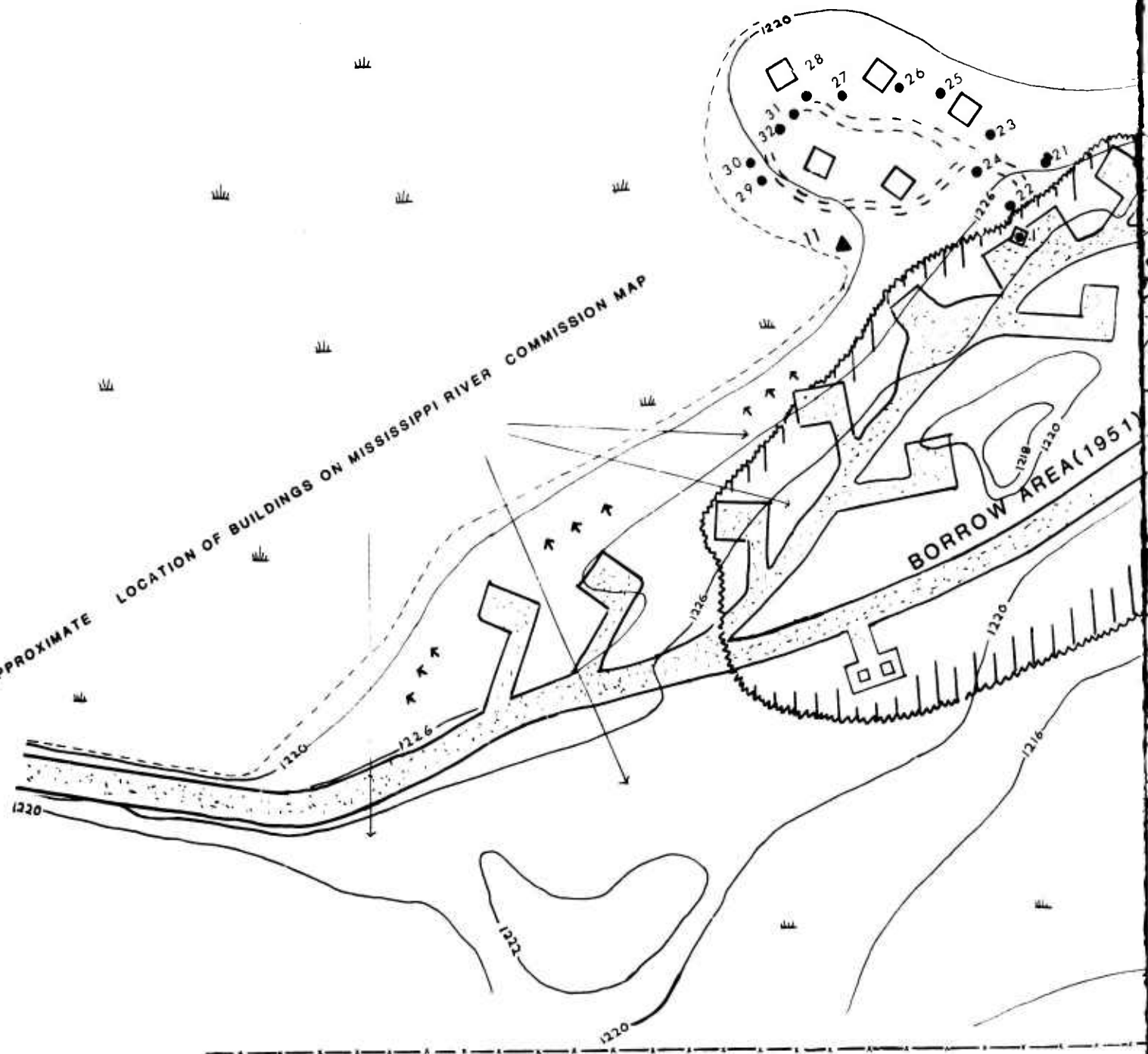


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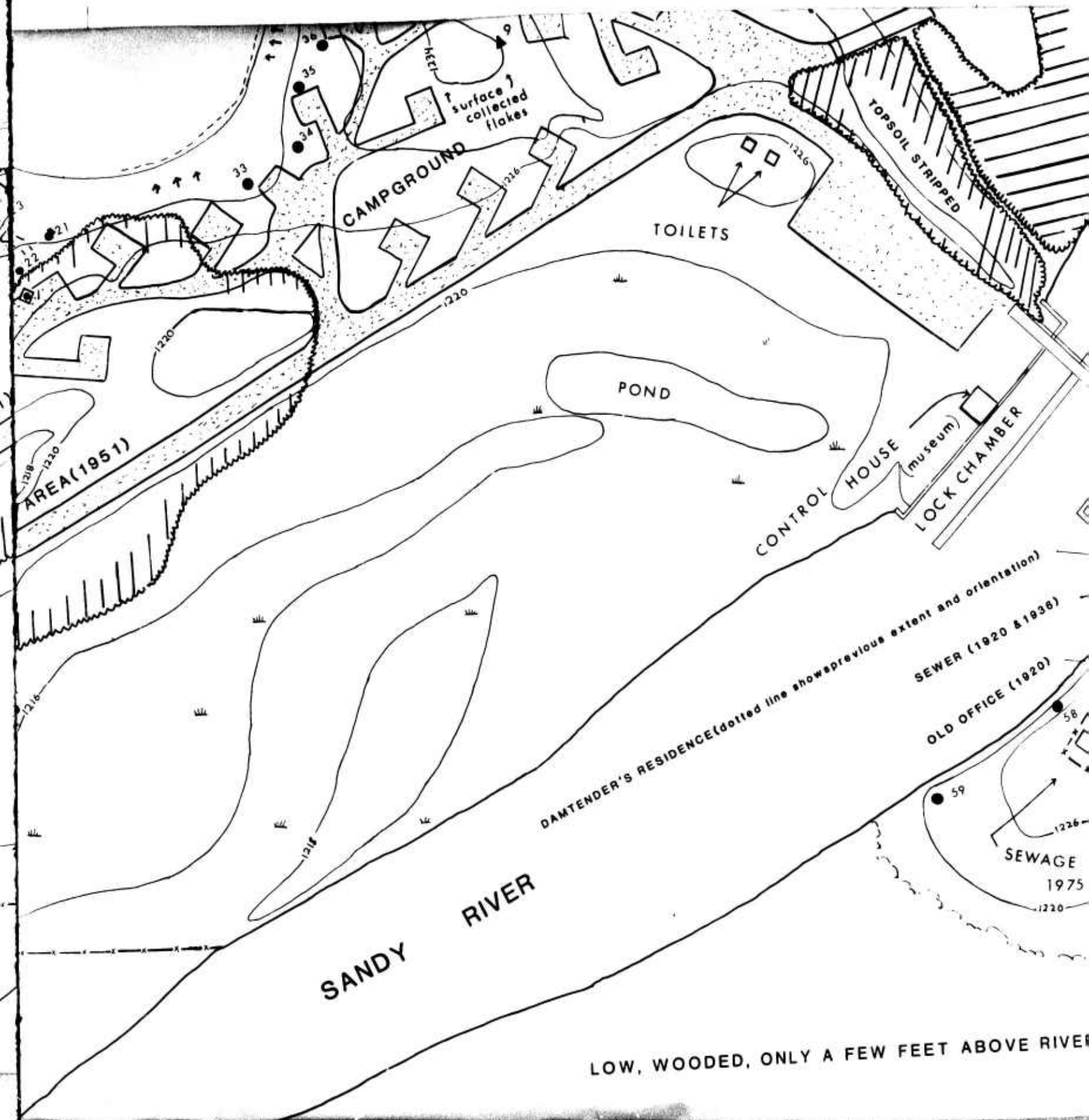


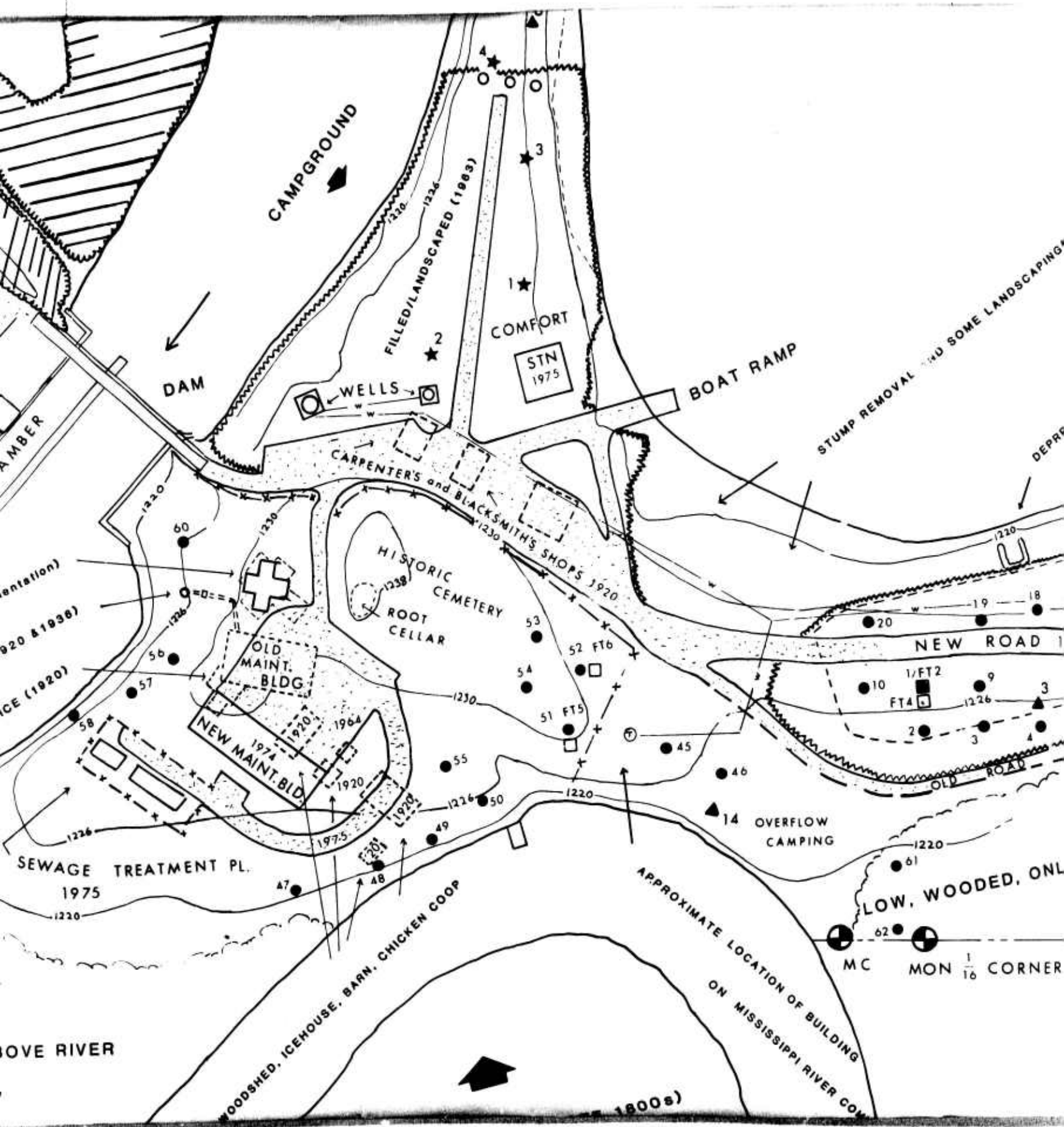
SANDY LAKE

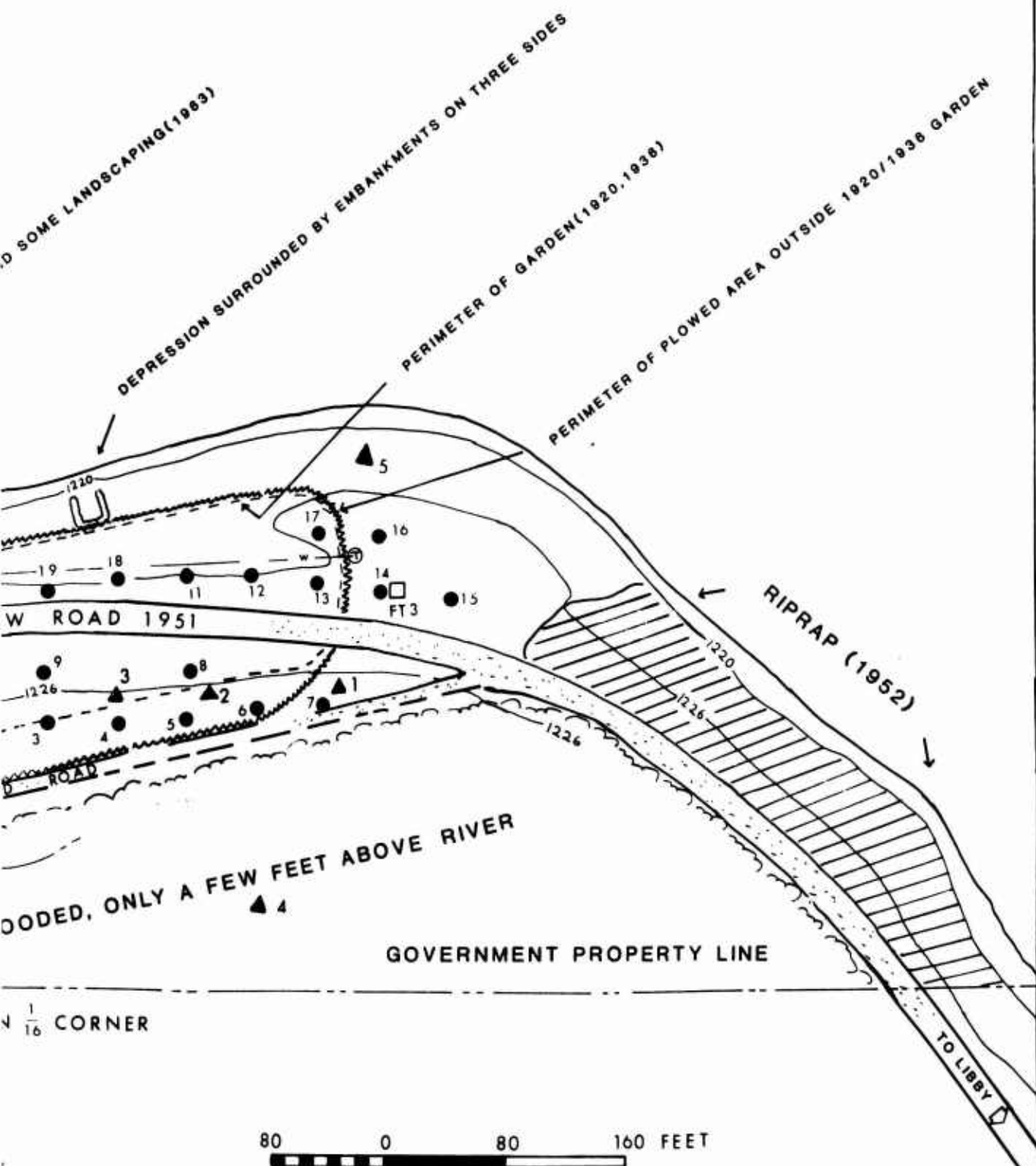
APPROXIMATE LOCATION OF BUILDINGS ON MISSISSIPPI RIVER COMMISSION MAP





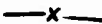
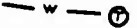











GOVERNMENT PROPERTY LINE

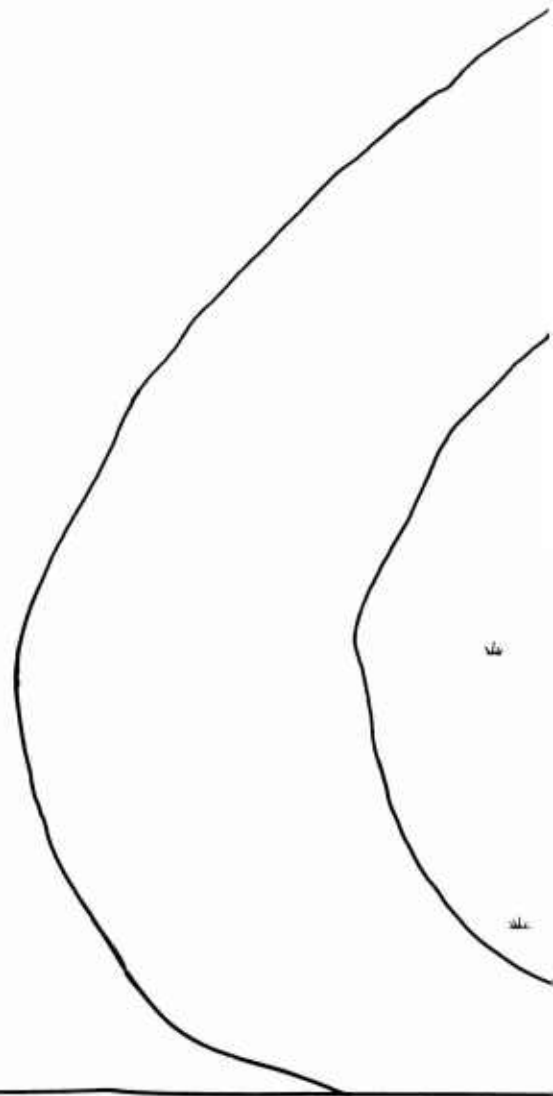






GOVERNMENT PROPERTY LINE

-  DATUM POINT
-  TENT PAD
-  FENCE
-  WATER LINE WITH WATER TAP
-  SURFACE COVERED WITH BLACKTOP OR GRAVEL
-  EXISTING STRUCTURE/DATE OF CONSTRUCTION
-  RECORDED LOCATION OF DEMOLISHED STRUCTURE
(DATE OF MAP THAT PROVIDED INFORMATION)
-  PARTIALLY DISTURBED AREAS (SOME OF CULTURAL
DEPOSIT APPARENTLY STILL INTACT)
-  DEEPLY DISTURBED AREAS (UNDISTURBED CULTURAL
EVIDENCE HIGHLY UNLIKELY)
-  FT3
-  22 FORMAL TEST UNIT/ SHOVEL-TEST 1985
-  6 FORMAL TEST UNIT/ SHOVEL TEST 1977
(Science Museum of Minnesota)
-  3 FORMAL TEST 1975
(University of Minnesota)
-  DOWNWARD SLOPE
-  OLD PINE



SANDY RIVER

SEWAGE

1075

1200

LOW, WOODED, ONLY A FEW FEET ABOVE RIVER

GOVERNMENT PROPERTY

LOCATING

