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PROCEDURES/QUALITY ASSURANCE MANUAL
CULTURAL RESOURCES INVESTIGATION
SUSITNA HYDROELECTRIC PROJECT

UPDATED MAY 1984

4.4.2

Museum



UNIVERSITY OF ALASKA, FAIRBANKS
Fairbanks, Alaska 99701

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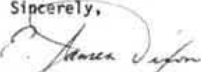
Mr. Jon Ferguson
Project Manager
Alaska Power Authority
334 W. 5th Ave.
Anchorage, AK 99501

Dear Mr. Ferguson:

Enclosed is the updated procedures/quality assurance manual for cultural resource investigations associated with the Susitna Hydroelectric Project. Although not required under the present contract to Harza-Ebasco this document is part of the revised scope of work (Amendment 1) recently agreed upon between the University of Alaska and Harza-Ebasco. Although the contract amendments have not been finalized, we are submitting this report directly to the Alaska Power Authority in an effort to maintain the program schedule in anticipation of our verbal agreement to transfer management of the University's contract from Harza-Ebasco to the Alaska Power Authority.

If you have any questions, please feel free to contact me.

Sincerely,


E. James Dixon, Ph.D.
Principal Investigator
Cultural Resource Investigations
Susitna Hydroelectric Project
University of Alaska Museum

sao

PROCEDURES/QUALITY ASSURANCE MANUAL
CULTURAL RESOURCES INVESTIGATION
SUSITNA HYDROELECTRIC PROJECT

UPDATED MAY 1984

Prepared By
University of Alaska Museum
Archeology Department

May 1984

TABLE OF CONTENTS

	<u>Page</u>
<u>TABLE OF CONTENTS</u>	i
<u>LIST OF TABLES</u>	v
<u>LIST OF FIGURES</u>	vi
<u>1 - INTRODUCTION.</u>	1-1
1.1 - <u>Scope and Program Objectives</u>	1-1
1.2 - <u>General Outline</u>	1-2
<u>2 - FIELD STUDY PREPARATION</u>	2-1
2.1 - <u>Introduction.</u>	2-1
(a) <u>Logistics.</u>	2-1
(b) <u>Prefield Orientation</u>	2-1
(c) <u>Field Review</u>	2-2
2.2 - <u>Logistics</u>	2-3
2.3 - <u>Prefield Orientation.</u>	2-4
2.4 - <u>Field Review.</u>	2-6
<u>3 - RECONNAISSANCE LEVEL TESTING.</u>	3-1
3.1 - <u>Introduction.</u>	3-1
3.2 - <u>Testing</u>	3-1
(a) <u>Survey Locale Form</u>	3-2
(b) <u>Survey Locale Map.</u>	3-3

3.3 - <u>Site Recording</u>	Page
(a) Site Location	3-3
(b) Site Datum	3-3
(c) Shovel Test Expansion	3-4
(d) Test Pit Excavation	3-4
(e) Artifact Collection	3-6
(f) Soil/Sediment Profile	3-6
(g) Site Map	3-7
(h) Photography	3-8
(i) Site Survey Form	3-8
3.4 - <u>Accessioning</u>	3-9
3.5 - <u>Site Description</u>	3-9
4 - <u>SYSTEMATIC TESTING</u>	3-10
4.1 - <u>Introduction</u>	4-1
4.2 - <u>Site Mapping</u>	4-1
(a) Grid Layout	4-1
(b) Staking Procedure	4-2
(c) Vertical Control	4-3
(d) Map Construction	4-3
4.3 - <u>Square Location and Set Up</u>	4-4
4.4 - <u>Excavation Procedures</u>	4-5
(a) Collection	4-6
(b) Three Point Provenience System	4-6
4.5 - <u>Data Recording</u>	4-8
(a) Field Notebooks	4-8

	<u>Page</u>
(i) Plan Map.	4-9
(ii) Narrative	4-9
(iii) Artifact Description.	4-10
(iv) C ¹⁴ Sample Description.	4-10
(v) Additional Requirements	4-10
(b) Soil/Sediment Profiles	4-11
(c) Photography.	4-12
4.6 - <u>Accessioning</u>	4-13
4.7 - <u>Site Description</u>	4-14
5 - <u>QUALITY ASSURANCE</u>	5-1
5.1 - <u>Introduction</u>	5-1
5.2 - <u>Organization and Responsibilities</u>	5-1
5.3 - <u>Quality Assurance Procedures</u>	5-3
(a) General	5-3
(b) Attendance	5-3
(c) Notebooks	5-4
(i) General	5-4
(ii) Reconnaissance Level Testing.	5-6
(iii) Systematic Testing.	5-7
(d) Artifact Catalogues.	5-8
(e) Photo Log.	5-9
(f) Survey Locale.	5-9
(g) Site Recording	5-10
(h) Reports.	5-11
(i) Equipment checks	5-11

5.4 - <u>Data Management</u>	<u>Page</u>
(a) Documents.	5-12
(b) Collections.	5-12
5.5 - <u>Quality Assurance of Vendors</u>	5-13
5.6 - <u>Internal Audits</u>	5-13
(a) Schedule	5-14
(b) Conformance.	5-14
(c) Records.	5-15
	5-15

APPENDICES

1	Susitna River Archeological Project, 1984 Fact Sheet.	A-1
2	Survey Locale Form.	A-9
3	Site Survey Form.	A-13
4	Terminology for Rock and Mineral Identification	A-21
5	Rock Identification Flow Chart.	A-24
6	Definitions of Lithic Artifacts	A-25

LIST OF TABLES

Table 4.1	Steps in the Accessioning Process	4-16
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LIST OF FIGURES

	<u>Page</u>
Figure 3.1 Example of Narrative Format Page.	3-12
Figure 3.2 Survey Locale Map Format.	3-13
Figure 3.3 Grid Template for Enlarging Survey Locale Map	3-14
Figure 3.4 Example of Completed Survey Locale Map.	3-15
Figure 3.5 UTM and Aliquot Template.	3-16
Figure 3.6 Template for Determining Latitude and Longitude	3-17
Figure 3.7 Example of Shovel Test Expansion With Single Shovel Test With Cultural Material.	3-18
Figure 3.8 Example of Shovel Test Expansion With Multiple Shovel Tests With Cultural Material	3-19
Figure 3.9 Artifact Collection Stamp.	3-20
Figure 3.10 Example of Test Pit Profile	3-21
Figure 3.11 Format for Reconnaissance Site Map.	3-22
Figure 3.12 Symbols Used for Reconnaissance Site Map.	3-23
Figure 3.13 Example of Reconnaissance Site Map.	3-24
Figure 3.14 Photo Log Format.	3-25
Figure 3.15 Example of Artifact Catalogue for Reconnaissance Sites.	3-26
Figure 4.1 Mapping Notes Format.	4-17
Figure 4.2 Mapping Notes Symbols	4-18
Figure 4.3 Example of Mapping Notes.	4-19
Figure 4.4 Example of Map for Systematically Tested Site	4-20
Figure 4.5 Plan map Format	4-21
Figure 4.6 Symbols Used on Plan Map.	4-22
Figure 4.7 Artifact Description Format	4-23
Figure 4.8 Artifact Description Guidelines	4-24

	<u>Page</u>
Figure 4.9 C ¹⁴ Sample Recording Format.	4-26
Figure 4.10 C ¹⁴ Sample Recording Guidelines.	4-27
Figure 4.11 Square Placement and Elevations Format	4-28
Figure 4.12 Wall Profile Format.	4-29
Figure 4.13 Symbols Used for Wall Profile.	4-30
Figure 4.14 Soil/Sediment Description Format	4-31
Figure 4.15 Soil/Sediment Description Guidelines	4-32
Figure 4.16 Example of Artifact Catalogue for Systematically Tested Sites.	4-34
Figure 5.1 Schematic Organization Chart	5-17
Figure 5.2 Example of Index in Field Notebooks.	5-18
Figure 5.3 Data Management Heading for Notebook Pages	5-19
Figure 5.4 Checklist for Survey Locale Data Sheets.	5-20
Figure 5.5 Checklist for Site Data Sheets (Reconnaissance).	5-21
Figure 5.6 Checklist for Site Data Sheets (Systematic Testing).	5-22
Figure 5.7 Checklist for Test Square Data Sheets.	5-23
Figure 5.8 Checklist for Profiles and Soil/Sediment Descriptions.	5-24

1 - INTRODUCTION

1.1 - Scope and Program Objectives

This manual updates the July 1983 Procedures, Quality Assurance Manual developed by the University of Alaska Museum for the Cultural Resources Investigation associated with the Susitna Hydroelectric Project. Procedures used between 1980 - 1982 (which do not vary significantly from procedures discussed here) are discussed in the following reports:

Dixon, E.J., Jr., G.S. Smith, R.M. Thorson, and R.C. Betts. 1980
Annual report, subtask 7.06 cultural resources investigation for the Susitna Hydroelectric Project.

Dixon, E.J., Jr., G.S. Smith, R.C. Betts, and R.M. Thorson. 1982.
Final report subtask 7.06 cultural resources investigation for the Susitna Hydroelectric Project: a preliminary cultural resource survey in the Upper Susitna River Valley.

Dixon, E.J., Jr., G.S. Smith, M.L. King, and J.D. Romick. 1982.
Final report 1982 field season subtask 7.06 cultural resources investigation for the Susitna Hydroelectric Project: cultural resource survey in the Middle Susitna River Valley.

The objectives of the Cultural Resources Investigation are to document prehistoric and historic sites, evaluate site significance, access impact, and recommend mitigation measures to avoid or lessen adverse impact to sites on or

eligible for inclusion in the National Register of Historic Places. This document outlines the procedures for achieving program objectives and the quality assurance program necessary to provide adequate confidence in the results of the cultural resources investigation.

1.2 - General Outline

Chapter 2 of this manual describes the three phases involved in field study preparation: logistics, prefield orientation, and field review. The purpose of field study preparation is to facilitate the efficient initiation and pursuit of fieldwork, maintain procedures through a quality assurance program, and ensure the safety of field personnel.

Chapter 3 describes reconnaissance level testing. The purpose of reconnaissance level testing is to locate, identify and inventory archeological and historical sites within the study area. This level of survey is aimed at identifying the type, size, and environmental associations of the site. Data recording using notebooks, survey locale forms, and site forms is discussed. The determination of site size is delineated. Details associated with the documentation of the site, the excavation of test pits, and the accessioning of artifacts are addressed.

Chapter 4 considers the same points in Chapter 3 but from the perspective of systematic testing. Systematic testing procedures are related to the increased control present at this level of testing. The purpose of systematic testing is to test sites in order to collect sufficient data to address site specific and regional significance and potential eligibility to the National

Register of Historic Places. Systematic testing provides data on such parameters as depth and number of cultural components, artifact density and diversity which are all pertinent for assessing significance.

Chapter 5 describes the quality assurance program and monitoring procedures. The quality assurance program is designed to provide control over the quality of research and ensure that data and reports produced as a result of the project conform to standards. The organization, responsibilities, and management of the quality assurance process are described.

2 - FIELD STUDY PREPARATION

2.1 - Introduction

Field study preparation is intended to facilitate the efficient initiation and pursuit of fieldwork, maintain procedures through a quality assurance program, and ensure the safety of field personnel. The task can be divided into three categories: (1) logistics, (2) prefield orientation, and (3) field review.

(a) Logistics

The logistical preparations for field study include: (1) application for pertinent state and federal permits, (2) advertising of positions and hiring of personnel, (3) acquisition of gear and supplies, (4) preparation for prefield orientation and (5) procedures development.

(b) Prefield Orientation

Prefield orientation has two roles - introducing personnel to procedures necessary for their safety and to ensure control on the quality and consistency of work. The orientation sessions are designed to make new personnel familiar with goals of the project and the hazards present. A major emphasis is placed upon the standardization of procedures necessary to ensure comparability of results and adherence to procedures.

Safety and regulation topics covered include: first aid training, lectures on the behavior of bears and other large game relevant to personnel safety.

weapons training, helicopter safety, camp regulations, project area restrictions, radio procedures and protocol, emergency procedures, personal gear requirements, and map orientation.

The important element of quality assurance in the work place is facilitated through a series of lectures and demonstrations of project procedures. Lectures discuss the prehistory of Interior Alaska, history of the Susitna Hydroelectric Project and the association of the University of Alaska Museum with it, location of the project area, and the goals of the project. Project procedures are discussed in relation to the type of work involved, e.g., reconnaissance level testing vs. systematic testing. Procedures and terminology used throughout the project are standardized. These topics include the meaning of specific terms, standardization of rock, tool, and soil descriptions. Camera procedures and documentation requirements for photographs are presented. Accessioning procedures are covered.

(c) Field Review

After reaching the project area, specific topics of safety and procedures are discussed in surroundings where the full import is made upon the employee. Survey and testing procedures are discussed on location with an emphasis upon the data collection and quality assurance procedures necessary to obtain project objectives.

2.2 - Logistics

Logistical requirements for undertaking field study include the application for pertinent state and federal permits, hiring of personnel, procurement of supplies, arranging for the prefield orientation, and development of procedures to facilitate attainment of project objectives. Permits are obtained from the state and federal agencies upon whose lands studies may be undertaken. Reports of field work performed under the permits are disseminated according to permit stipulations.

Personnel positions are advertised as early as funding and preparation of the scope of work allow. All potential employees are sent a brochure (Appendix 1) describing the project, their job responsibilities, and additional information to prepare the candidate for undertaking fieldwork.

Gear and supplies are organized and inventoried at the conclusion of each field season. Additional material required to complete the upcoming scope of work is ordered. All equipment is checked for serviceability and repaired or replaced as necessary. After supplies have been obtained, they are organized and packaged to facilitate orderly shipment to the project area.

Preparation for the prefield orientation entails organizing speakers and facilities in order to obtain optimal benefit of the time allowed. Lectures on first aid, animal behavior, weapons training, and photographic techniques are interspersed with project procedures and demonstrations.

An ongoing process of procedures development results in the preparation of updated guides and work aides to facilitate meeting project objectives and to enhance quality control. Map templates, for example, increase accuracy in producing enlargement of maps while reducing the time involved. Specific delineation of required information increases comparability in data collection.

2.3 - Prefield Orientation

The prefield orientation functions to introduce personnel to the objectives of the project and to indoctrinate them into the procedures required for their safety. Attendance will be taken at each session.

The safety component of the preparation consists of first aid training, discussion of hypothermia, helicopter safety, emergency procedures, wildlife lecture, and firearms safety.

Helicopter safety is presented using models, diagrams, and films. The content of Harza-Ebasco's helicopter procedures manual is given. Sling loading procedures are discussed. An emphasis is placed upon the correct procedures to follow in approaching and departing the aircraft. Closely allied with helicopter procedures is the use of the portable FM radios. Personnel are instructed in the use of the precision instruments. Correct communications protocol is presented. As early as possible in the field season, each individual is instructed in the actual use of the radios to overcome any hesitancy. Ground to air communications are discussed in reference to location (e.g., locating one's self relative to the pilot's orientation), wind

conditions, and suitability of landing zones. The primacy of the pilot in the transport and pickup of the crew is repeatedly emphasized. Helicopter requirements are discussed in reference to the selection of potential landing zones, location of crew in relation to the approach of aircraft, stowage of gear easily displaced by prop wash, and visibility of the crew's location through the use of florescent panels and signal mirrors distributed to each crew. The value of bright colored clothing is stressed. Hand signals to use in directing aircraft are demonstrated.

Procedures to follow in the case of emergencies are presented. These procedures will follow the guidelines developed for the Susitna Hydroelectric Project. The hierarchy in which people are to be notified of any emergency, procedures to follow for missing personnel, and the fire reaction plan for the Watana Base Camp are covered.

The presence of large wild game in the project area and the frequent encounters with bears while conducting the cultural resource survey necessitate a familiarity with wild animal behavior. Lectures are presented on the behavior of large game so that possible encounters terminate without harm to either party.

The proper use of firearms in protection is discussed. Demonstration and practicals in the use of 12 gauge shotguns and high powered pistols are conducted. No individual will be allowed to carry firearms without successfully demonstrating their proficiency and knowledge of safety to the instructor. Prohibitions on hunting in the project area due to the use of

helicopters are made known. Handling of firearms in aircraft and the stowage at the camp are also discussed.

2.4 - Field Review

Safety and research protocols are reviewed upon entering the project area. A full review of helicopter safety will be presented by a helicopter pilot prior to use of the aircraft. Topics covered include approach to and departure from the aircraft, off limits areas around the aircraft, and in-flight emergency procedures. The mechanics of rotor-wing flight and tour of aircraft components may also be included.

On-site demonstrations of procedures and ensuing discussions are intended to ensure that project objectives are met, consistency of data collection is maintained, and quality assurance procedures are implemented. Proficiency in basic data recording techniques and maps skills are tested and reviewed until all personnel are proficient in their areas of responsibilities. Radio communication is practiced with each member. Use of the signal mirrors and signal panels is demonstrated in directing aircraft.

Quality assurance procedures to be conducted at the conclusion of each day are demonstrated. This process includes accessioning and storing artifacts, logging in of accession and Alaska Heritage Resource Survey (AHRS) numbers used, and filing of reports. Crew leaders are instructed of their role in the quality assurance process and the necessity to pass reports onto their immediate supervisor for review. Security of artifacts and records is discussed at this time.

3 - RECONNAISSANCE LEVEL TESTING

3.1 - Introduction

The purpose of reconnaissance level testing is to locate, identify and inventory archeological and historical sites within the study area. The reconnaissance level survey is aimed at identifying the type, size, and environmental associations of the site.

The surveyable portions of the study area are organized into survey locales or other delineated areas such as proposed borrow sources, airstrips, etc. Both surface reconnaissance and subsurface testing are employed to locate sites within these areas.

3.2 - Testing

Reconnaissance level testing in the project area is conducted by surface and subsurface techniques. Surface reconnaissance is conducted in all survey areas including those which have exposed ground surface, such as tree falls, rodent and bear disturbances, erosional areas, and fire stripped zones. In places which have low surface visibility, subsurface testing using shovel tests is conducted.

A shovel test is a "shovel sized" round test, usually not over 30 or 40 cm deep. As each shovel of soil is removed from the test, it is inspected for cultural material. The number, location, depth, and any information

concerning the presence of charcoal, volcanic ash, or distinctive soil characteristics is recorded.

Recording pertinent survey locale information is done on the survey locale forms. This is usually done when the locale is completely surveyed. To aid the crew in completing the form, notes such as terrain, vegetation, etc. should be recorded in field notebooks in narrative form. The format for this page is illustrated in Figure 3.1. Key words such as **SHOVEL TESTS**, **VEGETATION**, etc. are written in bold letters in the left hand margin of each narrative page. These pages serve a general function in the recording of all data, and can also be used once a site has been found and even during systematic testing as will be discussed in Chapter 4.

(a) Survey Locale Form

While site survey is being conducted, information about the locale is recorded on the survey locale form, locale maps, and in notebooks. Photographs are also taken to document the locale. The survey locale form includes a brief description of the surficial geology and landforms in the immediate vicinity. It also addresses issues concerning the high, moderate, and low potential areas for archeological sites within the locale. Areas within the locale which can not be surveyed due to standing water, steepness of slope, and inaccessibility are also noted on this form. Additionally, areas of archeological potential near the locale but not tested are noted on the form. The survey locale form is shown in Appendix 2.

(b) Survey Locale Map

A survey locale map showing the location of transects walked and the location of all shovel tests is drawn for each survey locale. This map is usually an enlargement of part of a 1:63,360 scale U.S.G.S. topographic map covering the immediate vicinity of the survey locale. It includes topographic details which may not appear on the 1:63,360 scale map. This map shows all locations within the locale which were actually tested and, just as important, shows locations within the locale which were not surveyed. The format of the survey locale map and the symbols used appear in Figure 3.2. A grid template overlay for blowing up from a U.S.G.S. quad map which has been enlarged to 1" = 2000' is shown in Figure 3.3. An example of a completed map is shown in Figure 3.4.

3.3 - Site Recording

(a) Site Location

Once a site is found during reconnaissance survey its location is recorded by plotting the location on 1" = 2000' air photos available for the project area, and cross-checking this location with a U.S.G.S. 1:63,360 scale topographic map. The site location is then marked on both the air photo and the U.S.G.S. map. A University of Alaska Museum accession number and a State of Alaska AHRS number are assigned to the site immediately. The location of the site is later transferred to a UTM gridded U.S.G.S. 1:63,360 quad map. Determination of UTM and aliquot designations are aided by the template shown in Figure 3.5. The template shown in Figure 3.6 is used for determining latitude and longitude on U.S.G.S. maps covering the study area.

An intensive surface reconnaissance of the site vicinity is conducted to obtain an initial idea of the size and nature of the site. All surface artifacts are flagged for subsequent mapping and possible collection.

(b) Site Datum

A site datum is established on the site and is located in the southwest corner of the first reconnaissance test pit excavated. The datum may also be placed on the highest part of the site if the site is composed of multiple surface scatters. The site datum consists of a large metal nail with an aluminum tag attached. Enscribed on the tag are: AHRs site number, University of Alaska Museum, test pit number, and date. Distance and direction measurements from the datum to nearby features are recorded to aid in its relocation in subsequent years.

(c) Shovel Test Expansion

After a site has been surface searched it is systematically shovel tested to assist in determining its size, relative density and composition of artifactual materials. This process aids in the evaluation of site size for later study as well as providing data influencing later decisions on test pit placement and test square placement during the systematic testing phase of fieldwork. It should be noted that the shovel test expansion is only one of the ways site size is estimated. The size and configuration of the land feature on which a site is located is also important in estimating site size.

The shovel test expansion begins at a point where artifacts have been located in horizontal space, that is, a shovel test that encountered artifactual material (test with artifacts present) or at a location adjacent to a surface artifact. A grid system is then measured from that initial point, oriented in cardinal direction. Shovel tests are placed at a four meter interval in each of these directions and at the corners (SW, NW, SE, NE) to form an eight meter square outline (Figure 3.7). If cultural material is encountered in any of these shovel tests then the grid is extended in that direction for an additional four meters. In directions where no artifactual material is found (sterile test) the grid system is collapsed inward toward the initial positive test or surface artifact at a two meter interval. As a result, the shovel test expansion is sensitive to site size at a two meter interval. Figure 3.7 is an example of a shovel test expansion where cultural material is only encountered at the initial shovel test. In this situation a total of 17 shovel tests are excavated to assist in determining the spatial extent of the site. Note that the shovel test with cultural material in Figure 3.7 is enclosed by sterile shovel tests on a two meter grid interval.

Figure 3.8 shows an example of shovel test expansion where artifacts are encountered during expansion. This figure illustrates a series of site plots which indicate the sequence of shovel test placements to encircle the horizontal extent of the site.

The shovel test expansion program is intended to be used with some amount of flexibility. The excavation of shovel tests on sites provides information on site size and artifact density but may also add to site disturbance. To address this problem, shovel test expansion may begin farther than four meters

away from the initial positive shovel test. For example, a site may have an extensive surface scatter of artifacts which occur in discontinuous groups or clusters. The shovel test expansion should begin at the edge of the surface scatter. Whenever an expansion is conducted it should be done in increments of four meters to establish comparable coverage at all sites.

(d) Test Pit Excavation

The excavation of at least one test pit is next conducted at the site to obtain information on the soil/sediment stratigraphy and number of components present at the site. Reconnaissance test pits are 40 cm square, but may be expanded to determine the size of subsurface features. The first test pit excavated at the site is usually superimposed over the shovel test where the first artifactual materials were found or adjacent to a surface scatter of artifacts.

The topography at the site will often dictate the number of test pits needed. The actual number of tests at the site will ultimately depend upon the judgment of the crew leader. The amount of testing necessary is directly related to what has been recovered from the initial test pit and what has been recovered from the shovel test expansion.

(e) Artifact Collection

All artifacts recovered from the test pit excavation will be bagged by arbitrary five cm levels unless excavation was by stratigraphic units. Each artifact bag contains the following information: 1) AHRS number; 2) University of Alaska Museum accession number; 3) test pit number; depth below ground surface and stratigraphic level, if appropriate; 5) number and description of specimen(s) in bag (see Appendices 4, 5, and 6 for specimen description); 6) date excavated; 7) name of excavator(s) (Figure 3.9). Diagnostic artifacts are collected with three point provenience. A detailed discussion of this procedure is presented in Chapter 4. All individual bags from each test pit are placed in a large bag with site number, location, test number, date and name on the outside. Individual test pit bags are then placed in a site bag with the site number and date on the outside. Each bag is returned to the field base camp for cataloguing. Radiocarbon samples are double wrapped in aluminum foil and placed in zip lock bags labeled with the same information as artifact bags.

(f) Soil/Sediment Profile

A profile is required for each site whether or not sub-surface cultural material is found. A soil/sediment profile is drawn of at least one wall of each test pit excavated at the site. These profiles should not be schematic but should reflect soil units found in each square. The provenience of artifacts, features, and any charcoal found in the profile should be identified in the profile diagram. Figures 3.10 and 4.13 illustrate examples

of how profiles should be drawn and the key to be used for soil/sediment characteristics. Figure 4.15 lists information required on soil/sediments.

(g) Site Map

A site specific map is drawn for each site found during reconnaissance level testing. This is a large scale map of the immediate site vicinity indicating contour of the site, vegetation present, topographic and geologic features. Included on this map is the location of all shovel tests, test pits, site datum, artifact scatters, and surface artifacts or clusters. The format of the site map and its symbols appear in Figures 3.11 and 3.12. An example of a site map is illustrated in Figure 3.13.

(h) Photography

A 35 mm camera loaded with black and white print film is used to take photographs on reconnaissance level test sites. The first frame shot at a particular site should be a site identification exposure. The roll number, AHRS site number, date and excavation crew should be photographed to identify the beginning of specific site photographs. Each photograph taken at a site is recorded on the site survey form and in the photo log by roll, frame, direction of view, subject, and date. The format of the photo log and types of information recorded are shown in Figure 3.14.

(i) Site Survey Form

A site survey form is used for reconnaissance level data collection to ensure consistent site information. Although the form is organized to retrieve a large quantity of data, it is designed to supplement field notebooks, not to replace them. The site survey form is presented in Appendix 3. Major categories of site information recorded on this form include site location, ecological setting, site description, surface and subsurface artifact inventory, photographic record, and additional site specific information.

The usual procedure followed by crews in filling out these forms begins with the crew leader issuing particular sections of the form to various crew members. Each section is discussed, reviewed, and written while in the field. The crew leader is responsible for compiling each of the completed sections and making sure all field information is completed before leaving the site.

3.4 - Accessioning

The accessioning of artifacts is completed in the laboratory, at the base camp, or back at the University of Alaska Museum. This process consists of artifact cleaning, labeling, cataloguing, and packing. Extensive scrubbing and washing of the samples is discouraged because of polish build up and possible damage to edges. Artifacts are gently rubbed clean with fingers or a fine brush to allow for identification of form and lithic raw material type and to allow for labeling.

A University of Alaska Museum accession number which identifies the site and the individual artifact number are applied to the specimen with ink. The catalogue number is then entered into the artifact catalogue for reconnaissance sites. The catalogue is organized by site with the University of Alaska Museum accession number and by the AHRS site number and site name, if any. Additional information recorded for each site in the catalogue includes: date catalogued, name of excavator(s), name of cataloguer, names of crew members, and names of individuals checking the recording. Each catalogue number is recorded in sequence on the site page(s). Next the individual catalogue number, specimen description, provenience, excavator's initials, date excavated, and additional notes about the specimen are recorded. The format of the catalogue book is shown in Figure 3.15.

After the specimens are catalogued, they are then packed and stored for easy access. Storage is organized by site. Within each site, specimens are organized by test pit and shovel test.

3.5 - Site Description

Each site identified by reconnaissance level test is described in report form in the final report. Drafts of these reports are written in the field base camp and reviewed by a field supervisor. Modification may be required when subsequent artifact and soil/sediment analyses are conducted. Each site report contains the following broad kinds of information: site identification; site location; setting; level of testing; artifact inventory; and site map. These reports are based upon information contained on the site forms.

The location of the site referenced to the U.S.G.S. 1:63,360 scale topographic map, the UTM readings, latitude, longitude, township, range, meridian, and quarter section are also listed. The site location is also recorded in verbal form such as, "approximately 9.4 km north of Deadman Creek Mouth on the east bank."

The ecological setting of each site is discussed in detail and includes information on geography, geology and vegetation. After the ecological setting, a description of how the site was initially located and subsequently tested is presented. This description is followed by an artifact inventory which identifies the number and type of artifacts as well as their known stratigraphic provenience.

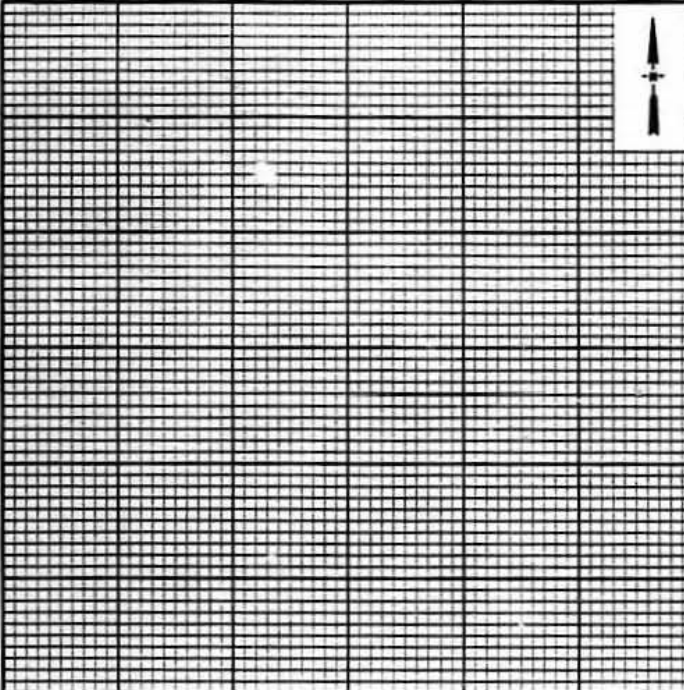
					
Shovel Tests: _____					
Surface Reconnaissance - - - - -				METERS	
Subsurface Tests - . - . - . -				Contour Interval: _____	
Helicopter Landing Zone LZ				Quadrangle: _____	
Survey Locale _____ Boundary - - - - -				T. _____, R. _____, _____ M.	
				_____, Sec. _____	

Figure 3.2 Survey Locale Map Format

ENLARGEMENT GRIDS FOR 1"=2000' AIR TERMINAL UNIT MAPS (1:2400)

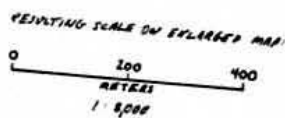
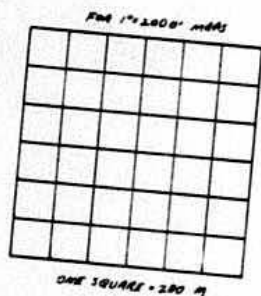
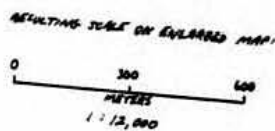
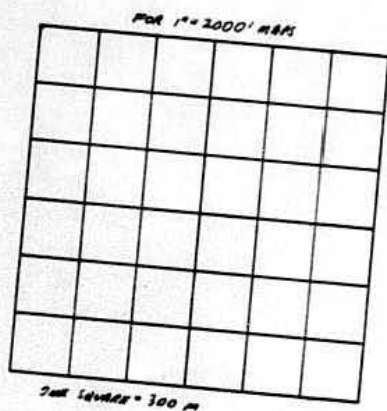


Figure 3.3 Grid Template for Enlarging Survey Locale Map

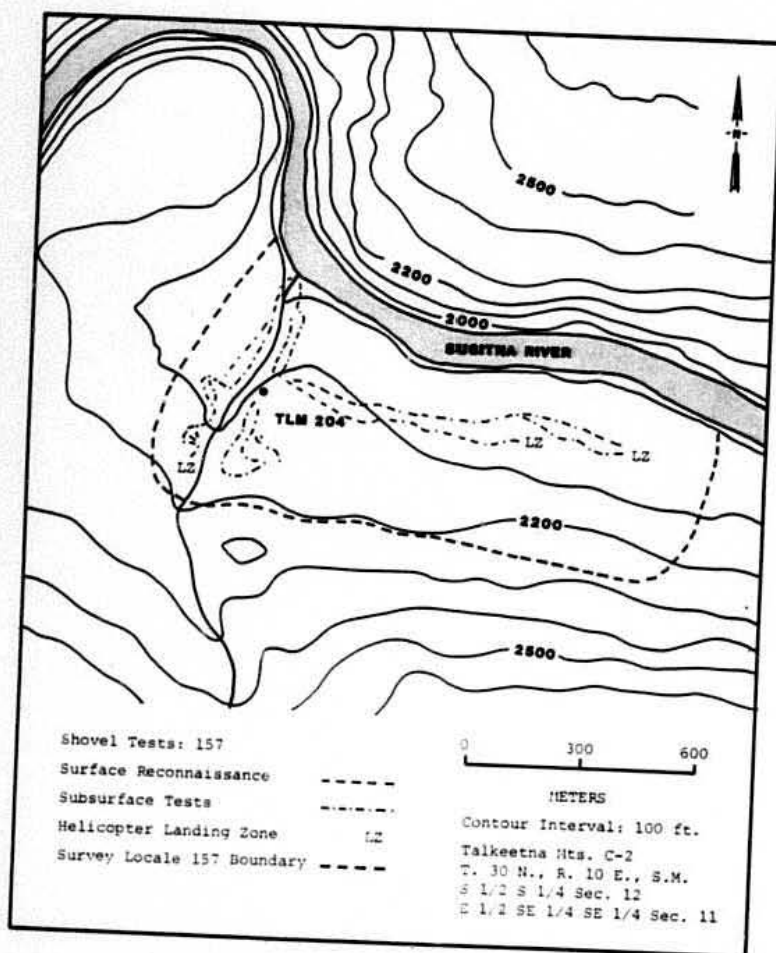


Figure 3.4 Example of Completed Survey Locale Map

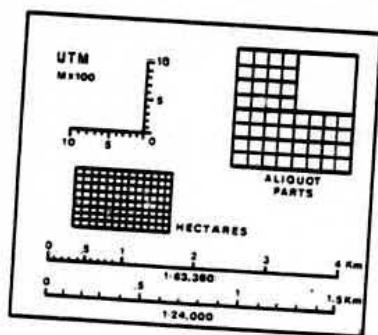


Figure 3.5 UTM and Aliquot Template

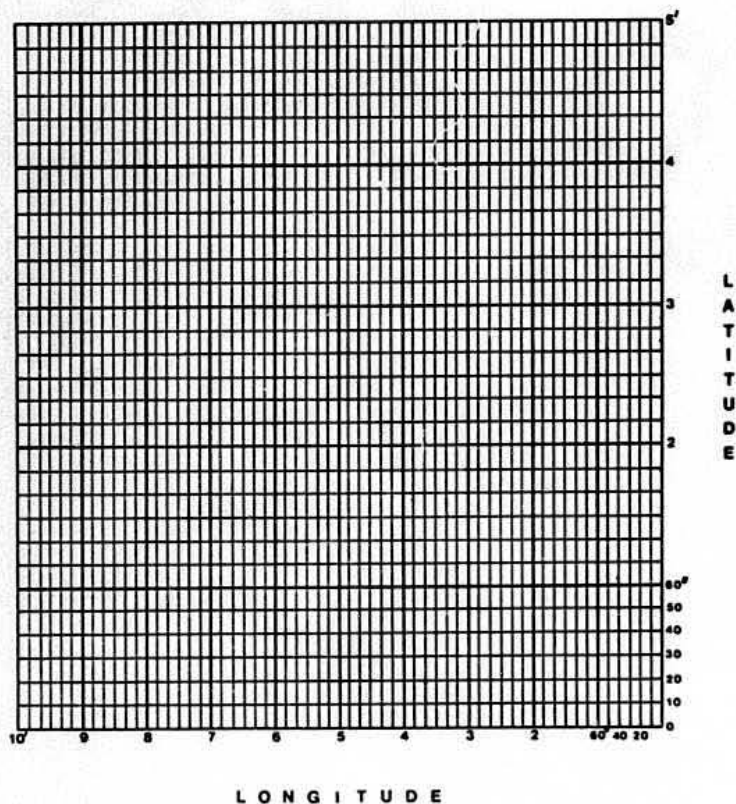


Figure 3.6 Template for Determining Latitude and Longitude

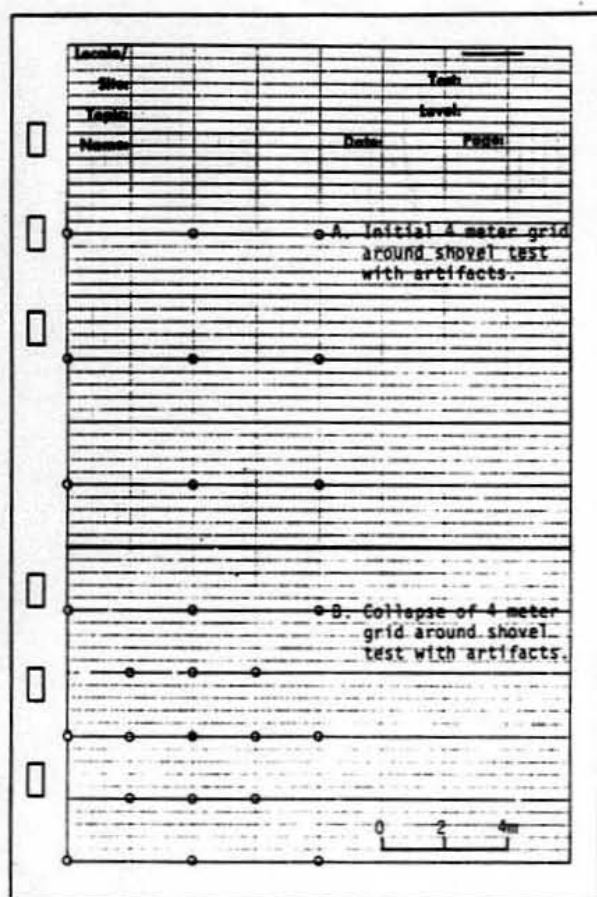


Figure 3.7 Example of Shovel Test Expansion With Single Shovel Test
With Cultural Material

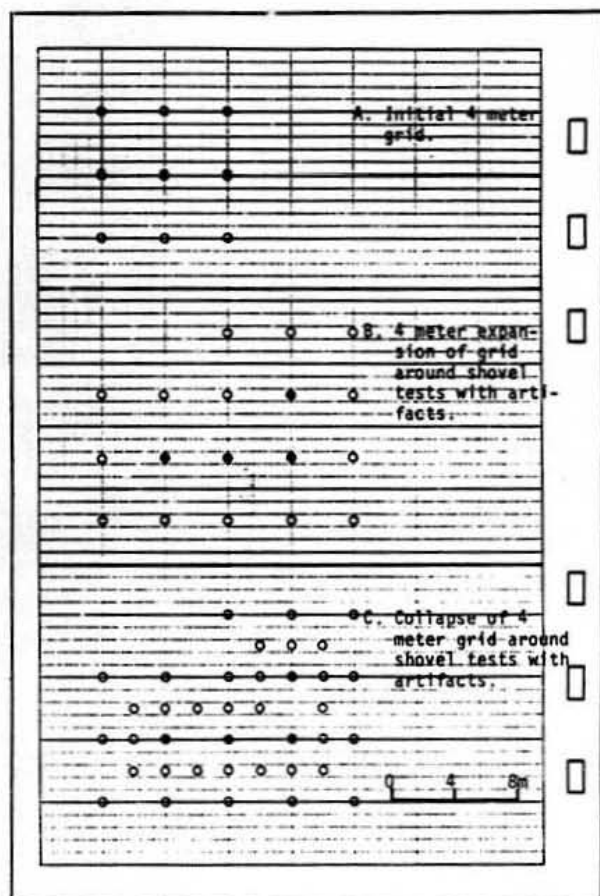


Figure 3.8 Example of Shovel Test Expansion With Multiple Shovel Tests With Cultural Material

Project _____
 Acc. no.: UA _____
 AHRS no. _____
 Survey Locality _____
 Locus or Scatter _____
 Surface ☐ Subsurface ☐
 Test _____
 _____" _____ m from _____ Datum
 Quad _____
 N. _____ E. _____ D. _____
 Date _____
 Excavator _____
 Stratigraphic Unit _____

 Contents _____

Figure 3.9 Artifact Collection Stamp

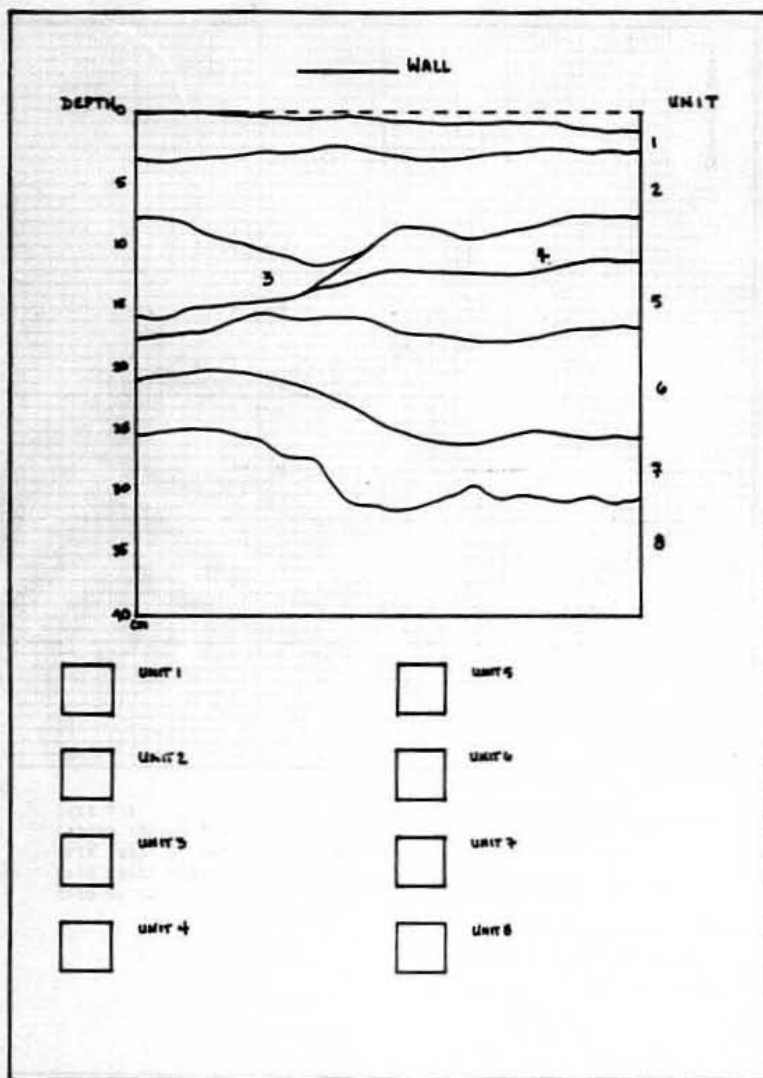


Figure 3.10 Example of Test Pit Profile

Test Pit
 Random Shovel Test
 Grid Test: w/ Artifacts
 Grid Test: Sterile
 Site Datum x

METERS
 Contour Interval: ___ m
 Quadrangle: _____
 T. ___, R. ___, ___ M.
 ___ 1/4 ___ 1/4 ___ 1/4, Sec. ___

Figure 3.11 Format for Reconnaissance Site Map

MAP SYMBOLS	
Surface Artifact	+
Depression	0
Previous Season Test Pit	■
Previous Season Shovel Test	●
Spruce Tree	*
Dwarf Birch	⊙
Birch Tree	⊙
Marsh	■
Stream, Creek	~~~~~
Deadfall, Down Tree	Y
Game Trail	---
Deflated Area	⊙
Boulders, Rocks, Outcrop	⊙
Intermediate Contour	⊙
Survey Monument	●

Figure 3.12 Symbols Used for Reconnaissance Site Map

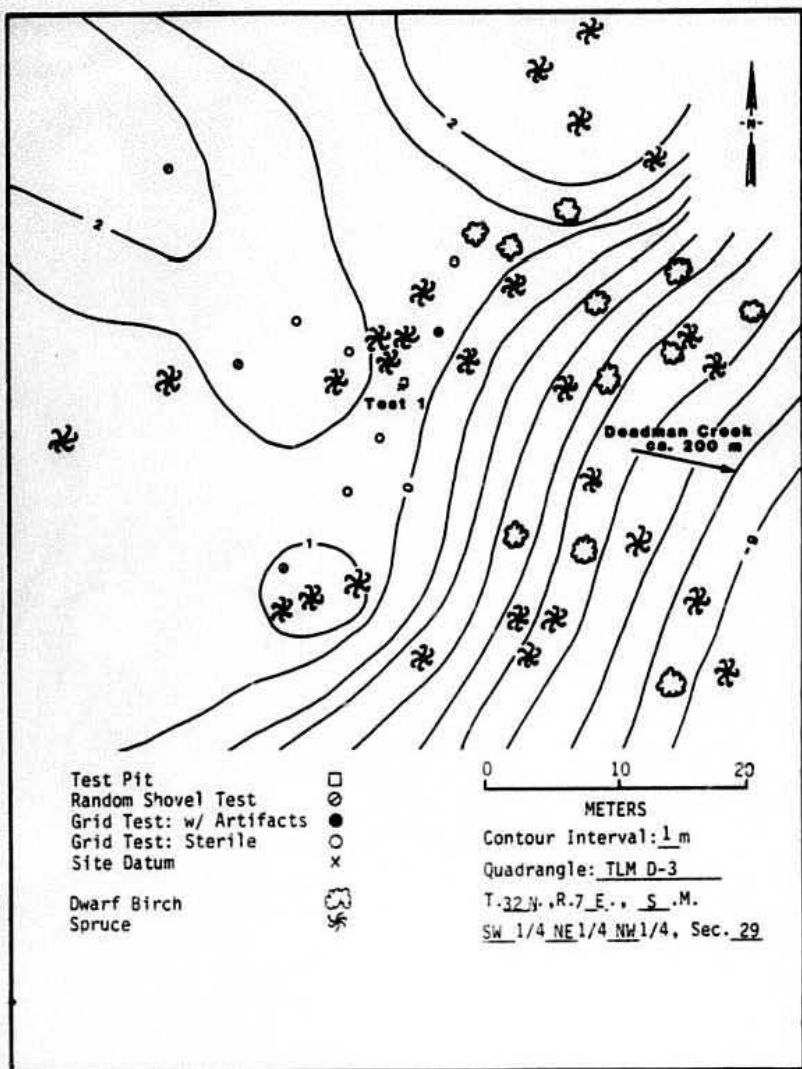


Figure 3.13 Example of Reconnaissance Site Map

[illegible]

Figure 3.14 Photo Log Format

UA ACCESSION NUMBER UA83-415
 AHS SITE NUMBER TLM 311
 SITE NAME NONE

CATALOGUED BY A. Young
 CATALOGUE DATE 7-22-83

EXCAVATOR(S) R.J. Dale, A. Young
 CREW PERSONNEL Dale, Young, O. Mason

CHECKED BY RJD 6-3-83
CU 9-30-83
CS 10/1/83

CATALOGUE #	SPECIMEN DESCRIPTION	PROVENIENCE	EXCAVATOR'S INITIALS	DATE	ADDITIONAL NOTES
UA83-415-1	1 QUARTZITE FLAKE	SURFACE T.P. 1	A.Y.	7-21-83	
UA83-415-2	1 BASALT FLAKE	T.P. 2 23 cmbs	RJD.	"	WATKIN TEKNA, IN RECOGNITION OF BONE FRAGS.
UA83-415-3	4 ARGILLITE FLAKES	T.P. 2 24 cmbs	"	"	WATKIN TEKNA
UA83-415-4	315 CALCINED BONE FRAGS.	T.P. 2 23 cmbs	"	"	WATKIN TEKNA
UA83-415-5	1 MODIFIED FLAKE, ARGILLITE	T.P. 2 30 cmbs	"	"	GRAY SANDY GRAVEL BELOW WATKIN TEKNA

Figure 3.15 Example of Artifact Catalogue for Reconnaissance Sites

4 - SYSTEMATIC TESTING

4.1 - Introduction

The purpose of systematic testing is to test sites located during the reconnaissance level survey in order to collect sufficient data to address site specific and/or regional significance and potential eligibility to the National Register. This testing is aimed toward the development of mitigation measures and a general mitigation plan for sites that will be adversely impacted by the Susitna Hydroelectric Project. Systematic testing provides data on such parameters as depth and number of cultural components, artifact density and diversity which are all pertinent for assessing significance. Sites to be systematically tested are prioritized on the basis of impact status and their potential to answer specific research questions.

In this section, the step by step procedures for systematically testing a site and organizing the data into a report format is outlined. The tasks include site mapping, square location, excavation procedures, data recording, cataloguing, and site description.

4.2 - Site Mapping

Prior to systematic testing a mapping crew is dispatched to the site to stake a grid system on the ground. The stakes are marked with grid system coordinates to provide horizontal control for test square layout. Elevation readings at the grid coordinates aid in the preparation of a contour map for the site, as well as providing vertical control for site excavation. The

mapping crew is equipped with a 20" transit, stadia rod, metric tapes, wooden stakes, and flagging tape.

(a) Grid Layout

The initial step in laying out a grid system is to establish a grid datum, which is normally at the same point as the site datum established during reconnaissance testing. If the site datum is situated at a point inconvenient for the establishment of a grid datum because of surrounding topographic or vegetation constraints, the site grid datum is moved to a more suitable location which will provide an unobstructed view along the baselines with a minimum of setups or vegetation removal. The site grid datum consists of either a metal spike or a wooden stake with a nail inset. The datum represents both the central point of the grid as well as a vertical reference point for the site.

Both north-south and east-west baselines extend through the grid datum. As far as practical, baselines are oriented along true cardinal direction. When the terrain has an orientation that cannot be accommodated by a true north-south or east-west baseline, the baselines will be rotated accordingly. The orientation of the grid is established with reference to true north (TN). A magnetic declination of 28 degrees east of north is employed as the project standard. With an angle of 28 degrees locked on the transit telescope, the transit is directed to magnetic north and the baseplate locked to the tripod. The instrument is then oriented to the required direction, noting the direction and amount of deviation from true north. After the orientation of the grid is established, coordinates of the grid datum are assigned such that

the site falls within the confines of the northeast quadrant of a large "imaginary" grid. A designation of N100/E100 is assigned to the grid datum. The Alaska Heritage Resource Survey (AHRS) site number, the grid coordinates of datum, and grid north (GN) orientation are engraved upon an aluminum tag attached to the datum.

(b) Staking Procedure

Baselines along the N100 and E100 axes are marked at 5 m or 10 m intervals depending on site size, by placing a 12 - 24 inch wooden stake at the required distance and pounding it into the ground until stable. All distances along the baselines are measured horizontally with metric tapes and are double checked for accuracy. Plumb bobs are employed for accurate placement of each grid stake. The stake is marked at the exact intersection of distance and alignment with either a black waterproof ink dot or a nail, and checked once the stake has been driven into the ground. The dots or nails provide accurate setup and sighting points for extending the grid. Grid coordinates, e.g., N99/E99, are recorded on two sides of the stake, unless loose soil or thick vegetation obscure it, in which case the coordinates are marked upon the plastic flagging tape placed around the stake for easy visibility. Additional lines at right angles to the primary baselines are staked as needed to provide control for laying out excavation squares.

(c) Vertical Control

Vertical control for the grid is established with transit and stadia rod by taking elevations at the top and ground surface of each grid stake, as well as

on the ground surface at unstaked grid coordinates off the baselines. The use of grid coordinates allows quick determination of location for stadia rod placement, efficient mapping in the field, and rapid transfer of points for drafting of the contour map. Additional elevation readings are taken at any topographic feature or break in slope. All readings are recorded in the field notebook according to a format appearing in Figures 4.1 and 4.2.

For convenience, the site vertical datum is arbitrarily set at 0.00 m at the top of the grid datum stake or the highest point in the locale. A temporary bench mark (TBM) may be established by placing a nail in a tree or marking another permanent feature near the site. The elevation of the TBM relative to the grid datum is recorded in the field notebook.

(d) Map Construction

After the map crew is finished with field work at a particular site, the elevation of the ground surface at each grid coordinate can be computed by subtracting (or in some cases adding) the stadia reading (in the "-" column) from the instrument height (HI) (see Figure 4.3). These elevations are then transferred to the appropriate point in the grid system as mapped on a sheet of graph paper. A mylar overlay is placed over the plotted matrix of points with their associated elevations, and contour lines drawn by interpolating the contour interval (.5 m or 1 m) from the elevation of adjacent grid coordinates. The location of reconnaissance test pits, shovel tests, and other relevant features are recorded in the field and eventually transferred to the contour map. The map is field checked before being finalized. An example of a completed site map is illustrated in Figure 4.4.

4.3 - Square Location and Set Up

Location and number of 1 m x 1 m test squares will be established based on information from reconnaissance testing and additional information needed to address specific questions of site significance. If site size has not been determined during reconnaissance testing by shovel test expansion (see Chapter 3), then this procedure will be completed prior to laying out the test squares.

Normally, at least three squares are laid out in a checkerboard pattern in an area of high artifact density, as determined by reconnaissance testing (see Figure 4.4 for an example of this pattern). When appropriate, one of the test squares may incorporate the reconnaissance test pit. Additional squares may be placed adjacent to the original squares or outside the high density area as deemed necessary.

In most cases, the test squares are laid out by the mapping crew using a transit, otherwise squares are triangulated in from the pre-established site grid stakes by the excavation crew using metric tapes. Each square is identified by the grid coordinates of its SW corner, e.g., N99/E99. A test square datum to aid in vertical control during excavation is also established by the mapping crew in a convenient corner of the square, and in most cases will also be the point of highest elevation adjacent to the square. The elevation of the square datum in reference to the elevation of site datum, e.g., - 0.5 m, is marked on top of the square datum stake. During excavation, all depth measurements are taken from the square datum stake.

4.4 - Excavation Procedures

It should be emphasized that systematic testing is still primarily a testing phase. Although the goal of systematic testing is controlled excavation, troweling should proceed with some speed until cultural material is encountered. A great deal of time is not spent recording data from sterile tests.

Excavation is done in natural stratigraphic units whenever possible. When the stratigraphy is not discernable, excavation is carried out in arbitrary 5 cm levels. Each quadrant of the square (NW, NE, SW, SE) is dug separately. In most cases, excavation of a stratigraphic unit for the entire square, i.e., all quads, will be completed before continuing down to the underlying unit. Excavation should continue into the glacial drift, which usually is reached in the project area at a depth of about 50 - 75 cm below the surface. All soil/sediment excavated from the test square is screened through a 1/8" mesh screen.

(a) Collection

All cultural material, with the possible exception of thermally altered rock within a large feature, is collected and bagged by stratigraphic unit and quadrant within each test square. Diagnostic artifacts, large bone fragments, identifiable bone, and isolated flakes, are three point provenienced, using the system described below, and are individually placed within a coin envelope and then within the appropriate quad bag for a particular stratigraphic unit. Lithic or bone clusters should also be three point provenienced, collected and

bagged as a unit, and then placed with the appropriate quad bag. Charcoal samples are also three point provenienced, and carefully collected by trowel and wrapped in a double sheet of aluminum foil before being bagged in a ziplock bag. A radiocarbon field number is assigned to each of these samples, e.g., CS2 (carbon sample 2). Each coin envelope or bag is stamped (see Figure 3.9), so that all the necessary information will be recorded. Small lithic debitage randomly scattered throughout the quad, collectable thermally altered rock, and artifactual material recovered from the screen are bagged in the appropriate quad bag without being three point provenienced. These are in turn placed in a larger bag containing all the quad bags for a particular stratigraphic unit, and then in a still larger bag containing all the material from a particular test square. Because artifact bags are brought back from the site at the end of a day's work, a new square bag should be started each morning for squares still being excavated.

Soil/tephra samples are collected from each square. A good sample representing each unit identified in the soil description and depicted on the profile should be collected, and the vial labeled with the site, square, and stratigraphic unit numbers plus the date. Field numbers are also assigned to these samples, e.g., SS 2 (soil/sediment sample 2). Additional soil samples may be collected from features or elsewhere in the square as determined by the supervisory personnel.

(b) Three Point Provenience System

In the three point provenience system used by the University of Alaska Museum, the following measurements are taken in centimeters and recorded on the coin envelope or bag in which the artifacts are placed:

N = distance from the south wall to center of artifact

E = distance from the west wall to center of artifact

D = depth of artifact - this measurement is taken at the intersection of a metric tape extending from the artifact base to a string with attached line level extending from the square vertical datum.

4.5 - Data Recording

In addition to the provenience data recorded on all collection bags, pertinent data are also recorded in field notebooks, on profile drawings, and by photo-documentation of the site as it is being excavated. Each of these types of data recording are discussed below.

(a) Field Notebooks

In order to insure the quality and comparability of field notes taken during systematic testing, a set of guidelines which standardizes the recording procedures is included in each field notebook. After the excavator is assigned a test square, he/she is responsible for completing: 1) a horizontal plan map; 2) narrative discussing soil/sediment, general artifact distribution.

features, etc.; 3) an artifact description; and 4) C^{14} sample description for each of the stratigraphic units excavated. If, for example, there were six stratigraphic units within a particular square, then six sets of data sheets (plan map, narrative, etc.) would be completed in the field notebook. Examples of the format for each of the data sheets plus the guidelines to aid in recording appear below. If necessary, in addition to this required information, the excavator will also record comments about the site as a whole, the environmental setting, possible interpretations of the data, etc. on separate sheets in the field notebook.

(i) Plan Map (See Figures 4.5 and 4.6)

Beginning with the ground surface, the horizontal plan map includes the following information: 1) surface elevation in centimeters below square datum (all points indicated on the plan map plus any additional ones necessary to portray surface morphology); 2) vegetation; 3) pertinent features within the test square, i.e., surface exposures, reconnaissance test pits, surface artifacts, etc. Additional plan maps according to the format illustrated in Figure 4.5 should be made for the top of each stratigraphic unit excavated, using the standardized set of symbols illustrated in Figure 4.6.

(ii) Narrative (See Figure 3.1)

The purpose of this data recording sheet is to give a concise summary of the soil/sediments, artifact distribution, features, and possible disturbance noted in a particular stratigraphic unit after it has been excavated. Key

words should appear in the left-hand column as in the example illustrated in Figure 3.1.

(iii) Artifact Description (See Figures 4.7 and 4.8)

A more detailed description of individual artifacts with their exact provenience is recorded according to the format of Figure 4.7. Guidelines for filling out each of the columns on the sheet are given in Figure 4.8. Refer to Appendices 4 and 5 for aid in determining rock and mineral types, and to Appendix 6 for definitions of lithic artifacts.

(iv) C^{14} Sample Description (See Figures 4.9 and 4.10)

When charcoal is encountered in the test square during excavation, a sample is collected, particularly when the sample is large enough for radiometric dating and is significant for dating archaeological or geological levels. A field number (CS - carbon sample) is assigned to each sample collected (e.g., TLM 016 CS1), and a permanent accession number later is given to the sample in the lab. Pertinent information to record on the data sheet (Figure 4.9) is outlined in Figure 4.10.

(v) Additional Requirements

Field supervisors or crew leaders have the additional responsibility of recording data pertinent to the site as a whole, such as the excavator of each square and the elevation and location of each square's datum. A sketch map of the placement of the squares is also made. See Figure 4.11 for the format in

recording these data. Keeping a record of the field numbers both for radiocarbon samples and soil/sediment samples is another responsibility of the field supervisor or crew leader.

(b) Soil/Sediment Profiles

Soil/sediment profiles are drawn for each wall of a test square after excavation of the square is complete. Prior to drawing the profiles, the excavator, in consultation with the field supervisor or crew leader, defines the stratigraphic units to be drawn and assigns them a numerical designation. Subunits are given alphanumeric designations. The provenience of artifacts, charcoal, soil/sediment samples, rodent burrows, etc., should also be identified on the profile. Before the actual drawing begins, a horizontal baseline is established for the wall being profiled. The baseline can be set either on the surface directly above the wall (usually at the same elevation as the square datum) or on the central portion of the wall. In the latter case, this line should be set at a 10 cm increment below the test square datum for ease of measurement, and positioned by running a string with attached line level between two nails set in the corners of the wall at the appropriate depth. A vertical reference is set by suspending a plumb bob from the 50 cm mark (the midline) at the top of the wall to be drawn. Vertical reference lines are also etched into the wall at the 25 cm and 75 cm marks, thus establishing five vertical references from corner to corner across the wall.

Once these reference marks have been established, the excavator can then proceed to measure the depth of each stratigraphic unit, taken in centimeters below the site datum at the top of each unit, beginning with the surface.

These data are then recorded on graph paper as dots marking the appropriate depths below square datum (see Figure 4.12), and the actual lines representing breaks between the strata drawn by using the dots as guides. On one 10 cm column of the profile, symbols representing the soil or sediment present (standardized symbols to depict the tephra units, organic layers, etc., are illustrated in Figure 4.13) are drawn in to help key the profile drawing to the soil/sediment description. The excavator is also responsible for recording soil/sediment descriptions, referenced by stratigraphic unit number to the units depicted in the profile. The format used for recording this information is illustrated in Figure 4.14, and the guide to aid in recording in Figure 4.15.

(c) Photography

Two 35 mm cameras, one loaded with color slide film and the other with black and white print film, plus a photo log book are standard equipment for the crew systematically testing a site. The procedures for identifying each roll of film when taking the first frame are described in Chapter 3. A separate log book is used for recording the photographs taken at each systematically tested site. The photos are recorded by roll number, frame, view, and description, and are taken of the following subjects in both black and white and color: 1) site area prior to excavation; 2) daily photos showing excavation in progress; 3) features, occupation surfaces, plan view of each stratigraphic unit before excavation; 4) test square profiles - each of the four walls; and 5) air photos of site with two 2 meter long panel flags placed along the site grid for scale. When features, stratigraphic units, or profiles are being photographed, a chalkboard or signboard is set up to

identify the subject. The chalkboard should include the site number (AHRS number), square, subject (unit or feature number), and date.

4.6 - Accessioning

The accessioning process involves organizing, cleaning, and cataloguing artifacts and samples, which, if at all possible, should be completed in the field lab. Basically the same procedures used for accessioning material from reconnaissance level testing are used for the systematically tested sites (see Chapter 3). In most cases, however, much more material is brought in from the systematically tested sites, and thus requires more organization. A hierarchy of steps is used to facilitate the accessioning process. These steps are outlined on Table 4.1, and the cataloguing format is illustrated in Figure 4.16.

The question of when to assign an artifact an individual catalogue number or when to include it with others in an artifact lot can sometimes be confusing, so helpful guidelines have been developed. One catalogue number can be assigned to three different categories of artifacts: 1) individual artifacts, 2) artifact clusters, and 3) artifact lots. The category of individual artifacts includes those which have been three point provenienced, flakes from flake lots recognized in the lab as being modified or having other characteristics which warrant their separation, and bone fragments which are potentially identifiable and have also been separated from bone lots in the lab. Artifact clusters which have been three point provenienced in the field and bagged separately are also given unique catalogue numbers. In other words, each separate item in the cluster is assigned the same catalogue

number, so the catalogue might read, UAB3-116-4 - 30 obsidian flakes (with the three point provenience of the cluster appearing in the catalogue entry). The final category, artifact lots, includes flakes or bone fragments which were collected from a particular quad but were not three point provenienced. Flake lots are broken down by material type (obsidian, chert, etc.) with each type receiving a catalogue number.

Labeling the artifact (lithic, bone, or other) with the assigned catalogue number is done directly on the artifact with pen and ink unless the flake or bone fragment is too small to be labeled. The catalogue number is also printed on the coin envelope or bag before the artifact(s) is replaced in it.

4.7 - Site Description

Each systematically tested site is described and evaluated. The narrative for each site description contains the following major sub-headings: testing, discussion, and evaluation. The number and placement of test squares are discussed under testing, while the major body of the narrative - description of stratigraphy, cultural components and associated artifacts, features, and dating - is incorporated in the discussion section. Determination of whether the site warrants additional testing and the significance of the site for answering specific research questions (when possible) are included in the evaluation section.

Figures and tables are also included in the final report to enhance the quality of the site description. A site map (see Figure 4.4 for example) and a composite profile are two figures which appear in the report for each of the

systematically tested sites. Histograms showing the frequency of artifacts per test square can also be included for sites from which a great deal of cultural material has been recovered. Tables which appear in the final report for each site are the following: soil/sediment description, artifacts summary per stratigraphic unit, and faunal remains description. An artifact summary by square and stratigraphic unit and a description of tool and tool fragments may also be included. A listing of the radiocarbon dates is another optional table, usually only included if many samples have been dated from the site.

Finally all field notes, profiles, a xerox copy of catalogue sheets, radiocarbon dating data sheets, photo log references, and copies of the narrative, figures and tables from the final report are compiled and organized in loose-leaf notebooks for future reference for all sites systematically tested.

Table 4.1

Steps in the Accessioning Process

- I. All artifacts are catalogued before C¹⁴ and soil/sediment samples.
 - A. All artifacts from one square are catalogued prior to starting on the next. The order in which squares are catalogued depends on their grid coordinates, and usually proceeds from west to east or from south to north. For example, test square N99/E100 would be catalogued prior to square N99/E105.
 - B. All artifacts from a particular stratigraphic unit in a square, beginning from the top, are catalogued before proceeding on the next stratigraphic unit.
 1. Diagnostic artifacts for each unit are catalogued first.
 2. All three point provenienced artifacts or artifact clusters are catalogued next, beginning with the NW quad, then to the NE, SW, and finally the SE quad.
 3. Quadrant referenced items (without a three point provenience) are catalogued next, beginning with the NW quad and proceeding as above.
 4. Artifacts associated with a particular feature or miscellaneous items such as thermally altered rock are catalogued after all four quads from the appropriate stratigraphic unit have been catalogued.
- II. Samples are catalogued after cataloguing all artifacts.
 - A. Radiocarbon samples are the first to be catalogued. Each sample is given an individual catalogue number in addition to the field number which has already been assigned. All the information recorded on the C14 sample data sheets, plus the date of drying, the date sent to Beta Analytic (or other laboratory) for dating, and a space for the age of the sample in radiocarbon years, should be included in the catalogue.
 - B. Soil and tephra samples are recorded in the catalogue by their field numbers only. These samples eventually may be incorporated into the collection of museum's tephrochronology lab, and therefore are not given individual catalogue numbers.

	Locale/ Site				Teeth
	Topic	MAPPING NOTES			Level
☐	Name		Date		Page
	CREW :				
☐					
☐	DATUM:				
	STA.	+	H.I.	-	ELEV. NOTES
☐					
☐					
☐					

Figure 4.1 Mapping Notes Format

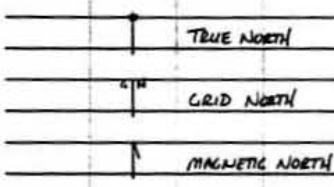
MAPPING SYMBOLS		
☐	P.C. =	PARTY CHIEF
	I =	INSTRUMENT PERSON
	M =	BOOKLET
☐	∞ =	CHAIN PERSON
	R =	ROD PERSON
☐		
☐	T.O.S. =	TOP OF STAKE
	O.G. =	ON GROUND
	E.O.C. =	ERROR OF CLOSURE
☐	STA. =	GRID COORDINATES
	H.I. =	HEIGHT OF INSTRUMENT
☐	ELEV. =	ELEVATION

Figure 4.2 Mapping Notes Symbols

Locality/ Site:	TLM 321		Tosh:	
Topic:	MAPPING NOTES		Level:	
Name:		Date:	Page:	
	CREW :			
	P. J. B.	C. UTERMOHLE		
	K. M.	H. MASCHER		
	W.	C. HEMPHILL		
	DATUM : SET AT N100 E100 NAIL IN HUB			
	GRID NORTH = TRUE NORTH			
STA.	+	H.I.	-	ELEV. NOTES
N100 E100				0 ⁰⁰ DATUM
	1 ³²	1 ³²		
N100 E100			1 ³²	-0 ¹⁵ O.G.
N85 E100			3 ⁰⁰	-2 ³⁰ O.G.
N90 E100			2 ³⁰	-1 ³⁰ T.O.S.
N90 E100			2 ⁰⁰	-1 ⁰⁰ O.G.
N100 E100			1 ³²	-0 ⁰⁰ DATUM
				EDG = -0 ⁰⁰

Figure 4.3 Example of Mapping Notes

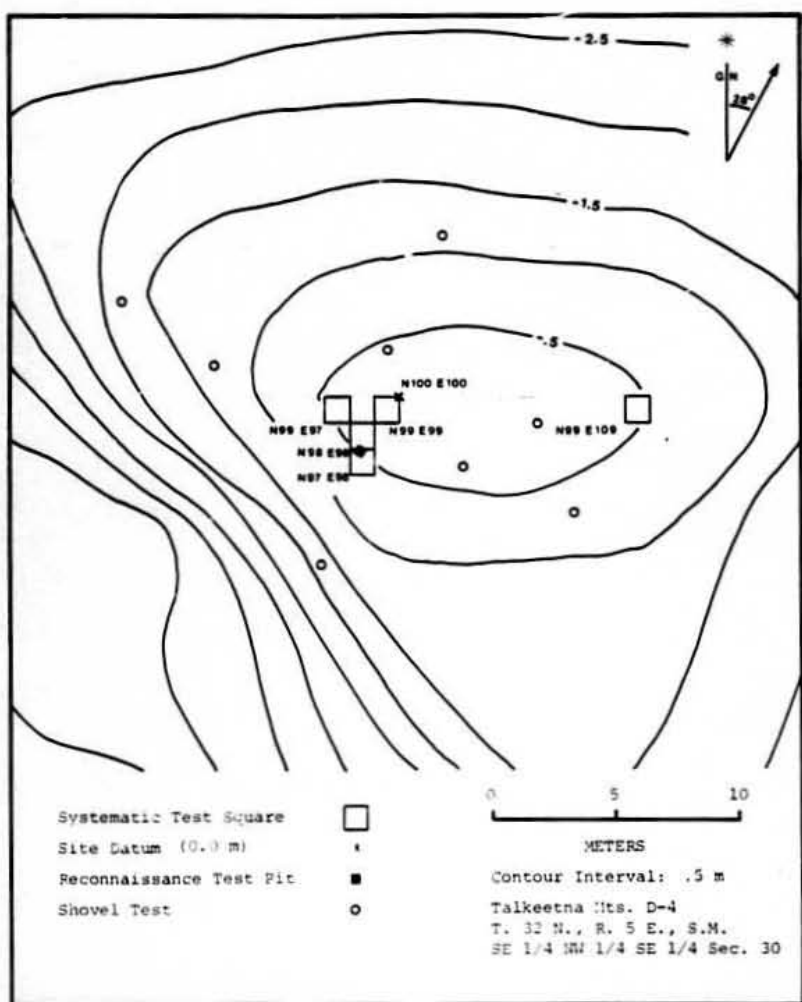


Figure 4.4 Example of Map for Systematically Tested Site

SYMBOLS FOR TEST SAMPLE PLAN VIEW			
	SAMPLE DATUM		ROCK FRAGMENT - THINBEDDED ASTORINO DESCRIBED
	LITHIC REFRACTORY		ELEVATION LOCATION
	LITHIC - CHERTOID		THINBEDDED - DISTINCT CONTRAST
	CHERTOID PIECES / FLAKES		THINBEDDED ASTEROID ROCK
	CARBONACEOUS WITH ELEVATION		ROCK
	CHERTOID SOIL		AREA NOT DOCUMENTED
	ASH - FICTITIOUS		LOCATION OF SAMPLE
	BONE FRAGMENT		GRIT - CHERTOID
			S - SOIL

Figure 4.6 Symbols Used on Plan Map

ARTIFACT DESCRIPTION		EXPLANATION
☐	PROVENIENCE (IN CM)	
☐	N = DISTANCE FROM SOUTH WALL TO CENTER OF ARTIFACT	
☐	E = DISTANCE FROM WEST WALL TO CENTER OF ARTIFACT	
☐	D = DEPTH OF ARTIFACT AT ITS BASE	
	RAW MATERIAL	TOOL TYPES
	ARGILLITE	UNMODIFIED FLAKES
	BASALT	MODIFIED FLAKES
	CHALCEDONY	SCRAPERS
	CHERT	BLADES
☐	OBSIDIAN	MICROBLADES
	QUARTZ	BURINS
	QUARTZITE	BURIN SPALLS
☐	RHYNOLITE	BIFACES
	METAL	PREFORMS
	GLASS	NOTCHED POINTS
☐	WOOD	STAMPED POINTS
		LEAF SHAPED POINTS
		LANCEOLATE POINTS

Figure 4.8 Artifact Description Guidelines

[illegible]

Figure 4.8 (Continued) Artifact Description Guidelines

C-14 SAMPLE COLLECTION GUIDELINES	
DESCRIPTION	☐
A) PROVENIENCE - N.E.D. (ALSO PLotted ON PLAN MAP) AND STRATIGRAPHIC UNIT	☐
B) SAMPLE DESCRIPTION - I.E., CHARCOAL, BONE, WOOD, PEAT, ETC.; PRESENCE OR ABSENCE OF MATRIX IN SAMPLE.	☐
C) ASSOCIATION WITHIN SQUARE (IN FEATURE, NEAR BONE CLUSTER, ETC.)	☐
D) ESTIMATED AGE - I.E., LESS THAN 1800 B.P. (MOORE DEVIL TEPHRA)	☐
E) POSSIBLE CONTAMINATION - ROOTS, RODENT BURROW, ETC.	☐
F) ARCHEOLOGICAL AND/OR GEOLOGICAL SIGNIFICANCE, I.E., CLARIFY LIMITING DATE FOR TEPHRA DEPOSIT DAYS LATER COMPONENT, ETC.	☐
	☐
	☐
	☐

Figure 4.10 C¹⁴ Sample Recording Guidelines

Location:			
Sheet:		Total:	
Topic: <u>TOOT SQUARE PLACEMENT MAP</u>		Level:	
Number:	Date:	Page:	
NOTE: EACH SQUARE NUMBERED WITH GRID COORDINATES AND EXCAVATOR'S NUMBER A = SQUARE CENTER (ELEV.) X = SITE STATION (ELEV.)			

Figure 4.11 Square Placement and Elevations Format

SYMBOLS FOR TEST SQUARE PROFILES			
	ROOTS		
	LOOSE ROCK / PEBBLES WITH COBBLES	S	
		D	
	HUMUS / FINELY SORTED ORGANICS	I	
		L	
	CHARCOAL	S	
	CHARRED HUMUS / GENERAL ORIENTATION		
	MOTTLING (COLOR) GREYED		
	LEACHED / UNDISTURBED		
	SILTY SAND / SAND	S	
		E	
	TUNDRA	D	
		I	
	SANDY GRAVEL	M	
		E	
	ROCKS / FROST SHATTERING	T	
		S	
	DRIFT		

Figure 4.13 Symbols Used for Wall Profile

	Locale/ Site:				Test:
	Topic:	Soil Description			Level:
☐	Name:		Date:		Page:
	UNIT #	MURSELL	UNIT DESCRIPTION		
☐					
☐					
☐					
☐					
☐					

Figure 4.14 Soil/Sediment Description Format

SOIL DESCRIPTION GUIDELINES			
☐	VARIABLES		
	SOIL : WET, DAMP, DRY		
	LIGHTING : OVERCAST, SUNNY, UNDER TREE		
☐	MUNSELL		
	HUE		
☐	VALUE / CHROMA		
	COLOR DESCRIPTION		
	DESCRIPTION		
	PARTICLE SIZE :	CLAY	—
		SILT	.0039 mm
		FINE SAND	.125 mm
		COARSE SAND	.25 mm
☐		GRANULE	.5 mm
		PEBBLE	2 mm
		COBBLE	65 mm
☐		BOULDER	250 mm
	SOIL MOISTURE		
☐	TEXTURE		
	DEGREE OF SORTING		

Figure 4.15 Soil/Sediment Description Guidelines

NATURE OF CONTACTS:						
THICKNESS - ABSDUT, CLEAR, GRADUAL,						☐
DISAPPE						
SHAPE - SMOOTH, WAVY, IRREGULAR,						☐
BROKEN						
EXTENT OF UNITS: CONTINUOUS / DISCONTINUOUS						☐
FROST FEATURES: PRESENT / ABSENT						☐
CONDITION OF COBBLES: GRAPE / Boulders / FRACTURES /						
POLISH / MAXIMUM SIZE OF COBBLES						
OR Boulders						
ORGANICS (INCLUDING LUMINAL): PRESENCE / ABSENCE						
CULTURAL MATERIAL: PRESENCE / ABSENCE /						☐
IN SITU / INTRUSIVE						
						☐
						☐
						☐
						☐
						☐
						☐

Figure 4.15 (Continued) Soil/Sediment Description Guidelines

UA ACCESSION NUMBER UA83-4
 AHBS SITE NUMBER TLH 305
 SITE NAME NONE

CATALOGUED BY A. JONES
 CATALOGUE DATE 5/9/83

EXCAVATOR(S) A. JONES, B. LONG
 CREW PERSONNEL JONES, LONG, KIRK

CHECKED BY A.J. 5/12/83
CSH 7/10/83
GBS 9/9/83

*LESSON #	SPECIMEN DESCRIPTION	GRID CODED.	QUAD	PROVENIENCE			STRATIGRAPHIC POSITION	EXCAVATOR	DATE	OTHER
				N	E	D				
1 03-4-1	BLACK BASALT FLAKE	N40 E100	NE	46	45	8	UNIT 4, FEA.2	JONES	5/7/83	
-2	" " "	"	"	46	45	13	UNIT 4, FEA.3	"	"	
-3	GABY (HGT BURN)	"	SW	67	00	1	UNIT 5	"	"	
-4	CA. 350 CHERT PLATES	"	"	66-80	70-75	10	UNIT 5, SMALL BONE CLUSTER. 15 CM IN DIAMETER	"	"	

Figure 4.16 Example of Artifact Catalogue for Systematically Tested Sites

5 - QUALITY ASSURANCE

5.1 - Introduction

The quality assurance program is designed to provide control over the quality of all aspects of the monitoring program and ensure that data and reports produced as a result of the project represent quality products.

5.2 - Organization and Responsibilities

Project personnel consist of a principal investigator, assistant principal investigator/project supervisor, research associates/field supervisors, crew leaders, crew members, and a support staff of secretaries, part-time laboratory assistants, student assistants, and museum technicians. The organization of personnel appears in Figure 5.1. The hierarchy of responsibility is graphically displayed in the chart with each higher level being responsible for the individual(s) below.

The crew member is at the initial level of quality assurance in the data collection process. The crew member is responsible for following established guidelines for field procedures, report preparation, and collections management. The crew leader supervises the crew members, is responsible for assuring the quality work by the crew, and for the orderly transmission of data and documentation into the quality assurance system. Field supervisors oversee the work of their respective crews, document compliance with procedures, and schedule activities for the efficient attainment of project objectives. Field supervisors also coordinate logistics in the field and are in

charge of the field program in the absence of the principal investigator and project supervisor.

The principal investigator and assistant principal investigator/project supervisor guide the direction and progress of meeting project goals, and monitor quality assurance procedures of field supervisors, crew leaders and crew members. The principal investigator and assistant principal investigator/project supervisor are responsible for the attainment of the project objectives. They approve changes in procedures and the quality assurance process.

Support personnel of secretaries, laboratory assistants, student assistants, and museum technicians are assigned tasks by research associates/field supervisors and higher levels of authority who are in turn responsible for quality assurance of the work performed at their request. The activities of the support personnel include administration, report preparation, expediting, and file and collection management. Secretaries record budget expenditures, process purchase orders, maintain time sheets, and transcribe reports into final format. Secretaries are also responsible for records management. Museum technicians, in addition to other tasks to which they might be assigned, are responsible for the curation of project collections and graphics.

Individuals are introduced to and educated in the quality assurance program and the hierarchy of responsibilities by pre-field orientation sessions, quality assurance meetings, and during the conduct of quality review. Copies

of the procedures manual with quality assurance monitoring procedures are present in each office or laboratory.

5.3 - Quality Assurance Procedures

(a) General

Among the general quality assurance procedures in effect for the project are those concerned with the identification of individuals, the manner of recording dates, and units of measurement. At the beginning of the field season, the names of the personnel and their distinctive initials will be recorded. Dates will be recorded in the format of month/day/year, whether spelled out or in numeral form. The units of measurement will normally be metric. The only exceptions are those measurements concerned with elevation (e.g., contour lines on U.S.G.S. quad maps) or when working with historic structures or objects in which the colloquial units convey special significance (e.g., 2 x 4 lumber or a caliber of .357).

(b) Attendance

In order to have a permanent record of the notification of procedures, regulations, attendance will be taken at all meetings concerned with changes in procedures or the quality assurance programs. Among the sessions which will be documented are instruction in first aid, project orientation, and helicopter safety, and weapons handling. Personnel will be notified of changes in procedures or monitoring practices either during meetings convened for that purpose or in writing and will document their knowledge of the

changes by roll call or by signing an attached sheet. Records of notification will be filed under the appropriate topic (e.g., helicopter safety, reconnaissance level testing, etc.) or, if of a general nature, in the memoranda file.

(c) Notebooks

(1) General

Organization of data recorded in the field is facilitated by the use of loose-leaf notebooks. Pages dealing with specific survey locales or sites are easily separated from individual notebooks and then reorganized into the appropriate survey locale or site notebook or file folder. This method of compiling data facilitates future research on the topics through the consolidation of information from several sources into a single location. Several quality assurance procedures are designed around this system of data management.

Each field notebook has three primary components: 1) a guideline section which details the format for data collection, 2) an index which lists the topic and page number of each notebook page completed, and 3) blank notebook pages stamped with a data management heading. The guidelines section of each notebook is a scaled down version of the procedures manual. Guidelines cover the content and format of data collected for survey of locales, reconnaissance level testing, and systematic testing. The use of a standardized format assures that all of the required information is recorded in the field, and that each individual's notes are of comparable completeness and quality.

The second component of the notebook is an index on which the individual keeps a log of each page completed. An example of an index page appears in Figure 5.2. The notebook pages are numbered consecutively as used and all pages must be accounted for in the index.

The main body of the notebook is comprised of notebook pages, each stamped with the data management heading illustrated in Figure 5.3. In the blank space after the heading "Locale/Site" the data recorder enters the survey locale or AHRS site number which is the subject of the notes. Other major headings, such as "Susitna Project 1984" which appears in Figure 5.3, may be placed on this line when the subject cannot be expressed as a locale or site. The topic being discussed is entered on the second line. Topics can be narratives on specific subjects, plan view, artifact inventory, soil/sediment description, etc. If the page is discussing a test (shovel, pit, or square), the designation of the test and the level concerned (if appropriate) are identified. The name of the individual, the date, and the individual's page number appear on the third line. Each new topic in the notes begins on a separate page. For example, when switching from describing artifacts to describing C^{14} samples from a particular stratigraphic unit at a site, a new page is used.

Upon the conclusion of work on a locale or site, the pertinent pages are removed from the notebooks and filed together. Table of contents for the collated pages and their source appear at the front of the files or notebooks. Examples of specific table of contents appear with the quality assurance procedures of the testing programs discussed below. After the pages have been collated for a specific survey locale or site, special page numbers in

consecutive order are placed on the line in the upper right hand corner. This procedure facilitates file management when working with data from various sources with duplications or gaps in personal page numbers. Completeness of the documentation and its conformation with project procedures is indicated by the signatures of the crew leader and field supervisor.

(ii) Reconnaissance Level Testing

Upon completion of a survey locale or reconnaissance level testing of a site, crew members' notebooks pages pertaining to the locale or site are assembled by the crew leader and placed in the appropriate notebook or file folder. A checklist for survey locale data sheets (Figure 5.4) or site data sheets (Figure 5.5) is filled out once all of the pages have been collected by entering the data recorder's initials and individual notebook page numbers in the right-hand column of the checklist labeled "reference". Only initials will appear opposite survey locale or site forms and maps as this information is not recorded on notebook paper.

Other information to be entered on the survey locale checklist is the AHRS number for sites located within the survey locale. It is also the responsibility of the individual entering data on the site checklist (usually the crew leader) to check the location of the site plotted on the UTM master map and other required maps. When all information has been entered, the crew leader signs and dates the line labeled "Entered by". A final check is made by the field supervisor and project supervisor, who also sign and date the checklist if all is in order. Items out of compliance are returned to the responsible party for correction in a timely manner.

(iii) Systematic Testing

The compilation of loose-leaf pages prepared in the process of systematic testing is the responsibility of the crew leader or the individual in charge. Three checklists are used to ensure that all of the appropriate information have been obtained and the pertinent pages have been collected. The checklists also serve as a guide for organizing the material within each site notebook.

The first checklist, illustrated in Figure 5.6, identifies all of the general data recording sheets required for the site as a whole. After these sheets have been collected and placed in the site notebook, the initials and page number of the individual recording the information are entered on the index. To assure proper management of the data, the collator signs the "Entered by" line. The individuals conducting quality assurance will sign the "Checked by" lines. Items not in conformance are returned for correction while still in the field.

In a similar fashion, the excavator's initials and page numbers are entered under the appropriate headings on the checklist for test square data sheets (Figure 5.7). A checklist for profiles and soil descriptions (Figure 5.8) is also prepared for each square. Only the profiler's initials will appear for the profiles which are drawn on large sheets of graph paper rather than notebook paper.

After all of the data sheets have been collected and the initials and page numbers recorded, table of contents similar to the checklists are made and consecutive site page numbers assigned. The notebooks are checked for accuracy and completeness by the field supervisors, who then sign and date each checklist/table of contents if all is in order. Records are kept of non-compliance items to ensure timely correction.

(d) Artifact Catalogues

The format of the artifact catalogues appeared in Figures 3.15 and 4.16. In order to verify that correct accessioning procedures have been followed, both the crew leader and field supervisor must sign these catalogues. The project supervisor may also randomly check the entries as part of the overall monitoring process and sign the catalogues. Quality assurance of the cataloguing process includes: verification of material and artifact type, checking counts, catalogue number on artifact, and samples stored according to procedures. Subsequent changes in the accession book are accomplished by cross referencing the item being changed with the location of the correct information. The original entry will remain in the catalogue although it will be marked with an asterisk or similar distinguishing symbol. This process ensures that changes can be traced to an individual and time.

(e) Photo Log

The format of the photo log appeared in Figure 3.14. Quality assurance procedures concerning photographs include checking for correct labeling and filing. All photographs referenced in survey locale and site reports are checked against entries in the photo log. A checkout system for film both ensures that unique roll numbers are assigned to the film and identifies the responsible individual for completing the photograph entries.

(f) Survey Locale

The design of the survey locale form is intended to facilitate the collection of comparable data on survey locales. The names and page numbers of all individuals involved in the survey appear on the form. A copy of the form appears in Appendix 2. A checklist of survey locales is prepared each season to facilitate the scheduling of survey locale map, air photo with overlay, and U.S.G.S. maps. The survey locale form with attached maps and notebook pages are reviewed by a field supervisor for completeness and accuracy. Upon successful review, the field supervisor will sign the form. Notebook pages will be placed in a survey locale notebook with a table of contents and checklist of the holdings for each locale as illustrated in Figure 5.4. The form and attached map are filed in folders. Notebook pages are filed in specially marked binders.

(g) Site Recording

A site form (Appendix 3) is used to standardize the information collected on each site during reconnaissance level testing. Complete documentation of a site consists of the form, a site location map if the site does not appear on a survey locale map, a site map of the immediate vicinity of the site, and a soil/sediment profile for each test pit, narrative pages from each crew member's notebook, and a draft narrative which will later be edited and appear in the final project report.

The format of the site map and the symbols used appeared in Figures 3.11 and 3.12, respectively. Symbols used in the soil/sediment profile appeared in 4.13 and the information on their characteristics is discussed in Figure 4.15.

The location of the site is transferred to the airphoto overlay (if available) and the U.S.G.S. inch to the mile map. In the office, the site location is transferred to the appropriate U.S.G.S. map which has been gridded for the computation of UTM coordinates. UTM coordinates will be obtained to the nearest 50 m using the template shown in Figure 3.5. This same template is used for determining the aliquot location of the site. A latitude/longitude template (Figure 3.6) is available for determining the latitude and longitude of the site.

After the site form and attachments are complete, the site form is signed by the crew leader and reviewed by a field supervisor who will attest to the completeness of the document by signing in the designated location. The individual field notebook pages are collected and organized with a checklist

and table of contents according to the format described above. The field supervisor will check the locational information of the site for accuracy.

(h) Reports

All reports enter the quality assurance system at the level of their origin in the hierarchy of personnel. Thus, reports produced by crew leaders are reviewed by field supervisors and project supervisor and/or principal investigator. Initial and final drafts of reports are reviewed for accuracy and completeness.

(i) Equipment Checks

Sensitive equipment subject to calibration errors or misalignment are checked for accuracy. Items included in this process are transits, altimeters, and compasses. Instruments are checked and calibrated according to manufacturer's specifications. Other equipment such as stadia rods and chains are checked for damage and repaired or replaced as necessary.

Cameras are checked at the beginning of the field season for accuracy of the meter readings and through the timely development of film. Cameras found to be malfunctioning are marked for repair and will not be used until the problems are corrected.

5.4 - Data Management

(a) Documents

In the field, all files will be kept in metal file cabinets. Files consist of site forms, survey locale forms, and notebook pages with the pertinent attachments of maps, soil profiles, etc. Site files will be organized in numerical order by Alaska Heritage Resource Survey numbers starting with sites within the Talkeetna Mountain quadrangle, then the Healy quadrangle. Survey locales will be organized by the number of the locale. When field data files have been checked by all appropriate personnel and are no longer needed in the field, they will be shipped back to the University of Alaska Museum in Fairbanks.

In Fairbanks, files will be organized in the same manner as in the field. Two sets of data files will be kept. One copy will be kept in the offices of the Archeology Department of the University of Alaska Museum and another set will be stored in another building or within the University of Alaska Museum's vault.

All data are organized according to topic and filed in folders or binders. Maps and large graphics are stored in map tubes or specially designed map cabinets.

(b) Collections

All artifacts will be given a University of Alaska Museum accession number, applied with permanent ink covered with clear fixative. All specimens will be entered into a catalogue by site and location of origin. Specimens will be curated in the field to the best of available conditions in a non-public area. Upon transmittal to the University of Alaska Museum, collections will be curated in accordance with museum procedures.

The University of Alaska Museum is designated as the repository for all artifacts and supporting documentation from lands owned or controlled by the Department of the Interior on the federal ARPA permit for the Susitna Hydroelectric project. The University of Alaska Museum is also designated as the repository on the State of Alaska permit for artifacts and supporting documentation collected as a result of the Susitna Hydroelectric Project.

5.5 - Quality Assurance of Vendors

Quality assurance and quality control manuals will be requested for all vendors used. This includes laboratories used for radiocarbon analysis. Only those labs that can demonstrate an acceptable quality assurance and quality control program will be used.

5.6 - Internal Audits

(a) Schedule

Quality assurance will normally be assessed during the periodic review of work in progress and report preparation. In order to ensure that quality assurance standards are met, and non-conforming items can be brought into compliance, quality assurance schedules have been developed for the field data collection phase. The following schedule is the maximum interval between audits of the data collection process. All field data will be reviewed after the first week of field work in order to identify deficiencies and bring the quality assurance process to the attention of all employees. Every two weeks thereafter, documentation and procedures will be reviewed. These regularly scheduled audits will allow for the correction of non-conforming documentation and erroneous data while still in the field and on-site visits are still possible.

As documents are finished, they will be entered into the quality assurance program of review. Scheduled reviews will be of most value for assessing work in progress as corrections can be made in a timely manner. A major function of the field supervisors is to maintain quality control of project procedures and documentation. In the capacity of quality assurance reviewers, field supervisors will examine documentation of survey locale, site forms, and related items as it is completed.

(b) Conformance

Conformance with quality assurance procedures will be assessed based upon the procedures manual and professional standards. Items not in conformance will be returned to the responsible party for corrective action. In order that a backlog of non-conforming items not develop, individuals will not be allowed to proceed with new tasks until all previous work is brought into compliance. Should it be impossible to bring items into conformance due to logistics or scheduling difficulties, the items will be noted as deficient and no reliance upon the data will be made.

(c) Records

The system of records management functions as an in-place documentation of the quality assurance process. All checklists and table of contents for notebooks have spaces devoted to recording quality assurance. Examples of these sheets appear in the attached figures. All data sheets not covered by the above checklists/table of contents will have the initials of the preparer and checker placed on the document itself.

Catalogues such as the accession book and photo log have a special location for documenting their review. All evidence of the review process resides with the item. Thus, quality assurance of the survey locale and site forms appears on the face of the forms. Notebooks have special pages for listing their contents which also function for recording the review process.

Special lists may be prepared for documenting compliance of items which do not have a space reserved for the review process. An example is the review of graphics resulting from final drafting. Checklists of accession and AHRS numbers are prepared in order to remove the potential for duplicate identification and ensure orderly record management.

Locality/
Site:
Topic:
Name:

Test:
Level:
Date: Page:

Figure 5.3 Data Management Heading for Notebook Pages

Locale/ Site:				Test:	
Topic:	CHECKLIST FOR SURVEY LOCALE DATA SHEETS			Level:	
☐ Name:			Date:	Page:	
☐	DATA SHEET			DEFENSIVE	
☐	NARRATIVE PAGES				
☐					
☐					
☐	SURVEY LOCALE FORM				
☐	SURVEY LOCALE MAP				
☐					
☐	AHRS NUMBER(S)				
☐					
☐					
☐					
☐			ENTERED BY		
☐			CHECKED BY		
☐					
☐					

Figure 5.4 Checklist for Survey Locale Data Sheets

Location/ Site	Task		
Topic	Level		
Name	Date	Page	
☐	CHECKLIST FOR SITE DATA SHEETS (SYSTEMATIC TESTING)		
☐	DATA SHEET REFERENCE		
☐	PLACEMENT & ELEVATION OF TEST SQUARES		
☐	FIELD NUMBERS (CHARCOAL)		
☐	FIELD NUMBERS (TERMINAL/SOIL)		
☐	OTHER		
☐			
☐			
☐			
☐			
☐	ENTERED BY		
☐	CHECKED BY		
☐			
☐			

Figure 5.6 Checklist for Site Data Sheets (Systematic Testing)

[illegible]

Figure 5.7 Checklist for Test Square Data Sheets

[illegible]

Figure 5.8 Checklist for Profiles and Soil/Sediment Descriptions

Appendix 1

SUSITNA RIVER ARCHEOLOGICAL PROJECT, 1984 FACT SHEET

UNIVERSITY OF ALASKA MUSEUM
SUSITNA RIVER ARCHEOLOGICAL PROJECT, 1984

Fact Sheet

Feasibility studies for a three billion dollar hydroelectric project on the Susitna River began in 1980. As part of this project the University of Alaska Museum was contracted to evaluate the impact of dam construction on archeological sites along 85 miles of the Susitna River upstream from the Devils Canyon and Watana dam sites as well as access corridors, transmission lines and areas of indirect impact. To date four years of study have been completed, resulting in the location and documentation of 245 sites. The program consists of both reconnaissance survey and systematic testing.

The Susitna River drains the southern slopes of the Alaskan Range, carrying glacial meltwater and runoff to the Cook Inlet. The Susitna is not navigable through Devils Canyon and consequently the project area has been essentially inaccessible and has remained remote wilderness. Talkeetna, on the Anchorage-Fairbanks Parks Highway, is the closest town and is a forty-five minute helicopter flight southeast of Watana Camp, the field headquarters for the overall project. Transportation from Fairbanks to the field will be by either bus, plane or train and helicopter.

It is anticipated that we will work out of the construction camp at Watana. A cafeteria, warm beds, and showers will be available in that case. Should we have to operate out of tent camp, you will be notified in time to make the

necessary adjustments. All field personnel will be expected to participate in camp chores.

Much of the helicopter flying will involve operating out of unimproved helispots and will be at low level. A helicopter safety class will be given for all crew members in Fairbanks prior to leaving for the field.

The weather for much of the field season will be cool and wet. Maximum July temperatures for the project area average 66 degrees and minimum July temperatures average 46 degrees. During the 1980, 1981, and 1982 field seasons the crew experienced snowfall as late as the second week in June and there was always snowfall in the higher elevations by the end of August. Summer rainfall can be heavy. Precipitation occurred on well over half of the days during the 1980 and 1981 field seasons although somewhat better in 1982 and 1983. Yearly precipitation in the project area is in the neighborhood of 200 inches. Vegetation varies from mixed spruce-hardwood forest in the lower elevations to treeless tundra above timber-line. Portions of the terrain are wet poorly drained tundra and muskeg with black spruce forest, typical of lower elevations in Interior Alaska.

Survey crews and/or excavation crews will have a two-way radio and will be able to communicate with project helicopters and Watana base camp.

A word should be said about wildlife in the project area. The Susitna River is located in true wilderness and abounds in wildlife which include moose, caribou, wolf, sheep and a extremely dense population of both black and brown bear. Although we did not have any serious problems with bears during

previous field seasons, we did have numerous encounters at close range and did have bears come into our base camp at night. Many of the crew members carried firearms and it is the policy of the museum to leave the option up to the individual on whether or not to carry a personal firearm. Everyone will be required to take a firearms safety class which will include firing shotguns. Several crew members carried handguns rather than deal with the weight and awkwardness of a shotgun. Those taking firearms into the field will have to demonstrate that they can effectively and safely use them. If you intend to take a handgun into the field you will have to demonstrate that you are experienced with it and competent in handgun care and safety. It should be of .357 magnum or larger caliber to be of any real protection. There is no reason to bring any smaller caliber gun or other types of weapons into the field. You should be aware that it is highly illegal to transport a handgun through Canada for any reason. Flights directly to Alaska from the "lower 48" are not affected by this law.

Also included under wildlife are mosquitos. Alaska is famous for its rich variety of insect life. The museum will provide free insect repellent.

EQUIPMENT

Personal gear should be kept as light and compact as possible. Helicopter space and weight restrictions require personal gear to be kept within reasonable limits. One large backpack, one duffel bag and one day rucksack should be sufficient (we can always make an exception for a guitar in the event someone has talent in that direction). Frequently personal gear will have to be transported tied into the outside basket of a helicopter and will

often wind up getting wet so it is wise to waterproof packs and duffel bags. Table 1 is a guideline (not intended to be complete) for major items of personal gear. Items marked by an * are ones which are essential. You should bring items that will make your stay in the field as comfortable as possible bearing in mind the parameters of archeology in remote locations. If you have any questions concerning field gear feel free to call the Museum.

Good quality rain gear is a must. Rain pants and hat as well as a rain jacket may be the most important items you take into the field. The summers of 1980 and 1981 were extremely wet, and apparently rainy weather tends to represent a typical summer on the Susitna, although 1982 was a little dryer. An investment in a full suit of good quality rain gear will be well worth the money. Also, along the same line, waterproof boots are extremely important. One of the best boots for Interior Alaska is the Maine Hunting Boot manufactured by L.L. Bean. This boot is rubber with a leather upper part and comes in various heights. If you bring leather boots be sure to bring plenty of water-proofing wax.

It will be important to have a watch because of helicopter scheduling and preplanned "pickup" times for field crews. Although first aid supplies will be available at the Watana Camp where a medic will be stationed, you may want to carry a small personal first aid kit. A personal emergency kit is something each individual working in remote areas should carry. It should be small and compact. All the essential items can be contained in a large bandaid can. A typical kit might include waterproof matches, a plastic garbage bag (emergency sleeping bag or raincoat), fish hooks and line, a high energy candy bar, hard candy, needle and thread, monofilament line, and other

small items such as aspirin. Larger items which can be used in an emergency such as a signal mirror, smokebomb, signal panel and compass will be issued by the museum. Part of the orientation training in Fairbanks will involve a first aid class.

The University pays in two-week pay periods, however, it may be three or four weeks before your first check is issued since paychecks are two weeks behind. While in the field you have the option of having your checks held at the Museum or deposited in the University Credit Union or in a local bank in your account.

Transportation to and from Fairbanks, as well as housing during prefield training in Fairbanks are the responsibility of the individual so bring enough cash to cover these expenses. Food and lodging will be provided in the field.

The mailing address will be:

Name

c/o University of Alaska Museum

Archeology Department

University of Alaska

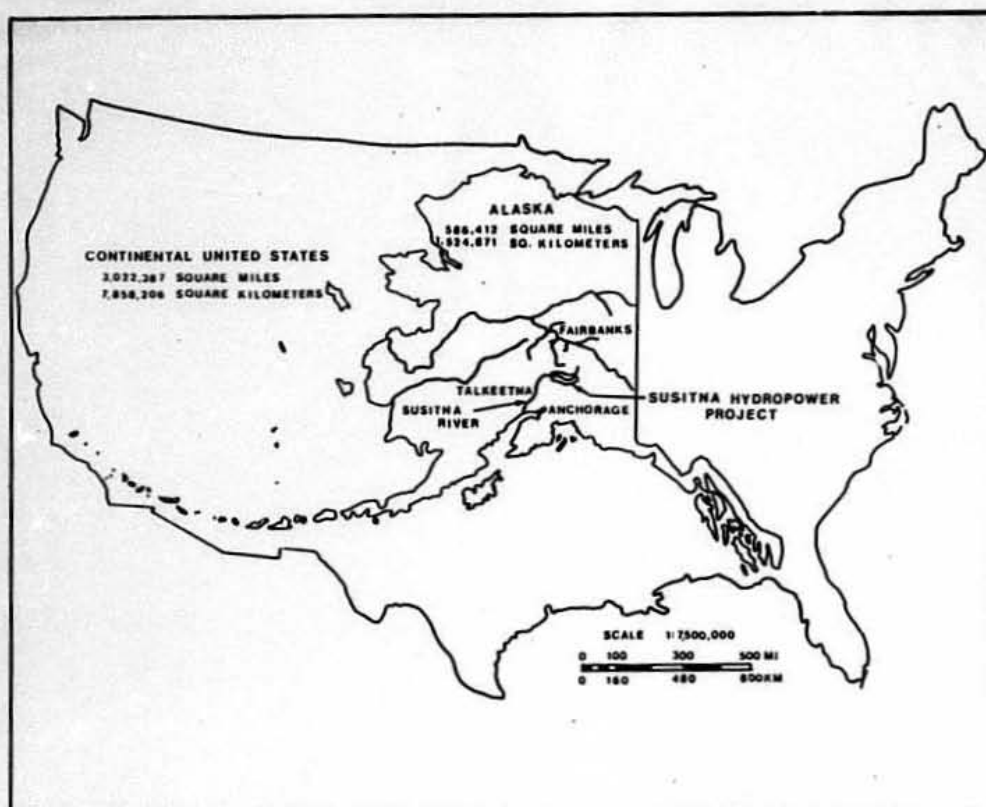
Fairbanks, AK 99701

TABLE 1. SUGGESTED FIELD GEAR

Sleeping Bag (Down or Polargard; should be at least a 20° bag)*	Windbreaker (with hood)
Sleeping Bag Liner	Toothbrush/Tooth Paste/Dental Floss and other personal items*
Rain Gear (pants, jacket and hat)*	Sweatshirt (with hood)
Waterproof Boots*	Heavy Jacket*
Lightweight Boots or Tennis Shoes (for camp)	Personal Medication (please inform the project supervisor if there would be a problem if you did not get your medication)
Day Rucksack*	Camera and Film
Shotgun (12 gauge) or Handgun and Ammunition (museum will provide 12 gauge shells)	Envelopes, Stationery and Stamps
Alarm Clock	Fishing Gear and Fishing License
Watch*	Reading Material
Flashlight (batteries)	Musical Instruments
Wool Socks*	Sewing Kit
Work Shirts	Personal First Aid Kit*
Down Vest (bright color)	Personal Emergency Kit*
Long Underwear	Personal Tent (if desired)
Work Gloves/Wool Gloves	Wool Hat (sock hat)
Cash*	Sunglasses
	Mirror (camp type)
	Extra glasses*

*Essential Field Gear

It is anticipated that crews will be taken into the Watana base camp on the average of once a week to do laundry and shower. Therefore, enough personal clothing should be brought for at least a week to ten days. It doesn't hurt to have a little extra.



Appendix 2

SURVEY LOCALE FORM

SURVEY LOCALE:

CHECKED BY DATE

SUSITNA HYDROPOWER PROJECT
SURVEY LOCALE EVALUATION FORM

This form is intended to insure that three kinds of data for each locale are recorded. These data will guide additional survey, evaluation of areas that may need no further work, and document areas surveyed and tested on-the-ground. If supplementary information to this form is included in fieldnotes, please note this on the form along with your name(s) and field book page number(s).

1. A field description of the locale is needed. The field description of the locale should include the uniformity and variability of surface morphology. The information which you record will be used to compare this locale with other locales to determine similarity and aid in future locale selection and testing.

a. Describe the surface morphology noting topographic features, drainage, soils, variation in surface slope, etc.

[illegible]

- b. What, if any, are the discrepancies between the definition of the geological unit (based on air photo interpretation) and the field observation of the unit? Would you characterize the total area as a single unit based on the homogeneity of surface morphology?

II. Identify areas within the locale that potentially may be eliminated from further archeological survey. Please provide objective criteria in your evaluation such as: 1) areas where testing is not feasible using standard archeological field techniques (areas of standing water, talus rubble); 2) areas where the substrata have been removed by natural erosion (indicate whether these areas have been surface examined for archeological materials); and 3) overly steep slopes. This would include slopes of greater than 15° to horizontal which you deem unlikely for site occurrence (describe and measure slope angle).

III. Identify areas within the locale which may have high archeological potential, based on known site locales from other areas and your field experience, including overlooks, river terrace and bluff edges, lake and stream margins, etc. Describe the location, extent, salient features, and tests (if applicable) for these locales, record these locations on USGS maps.

High archeological potential areas that should be investigated --

IV. Locate on maps where the survey team actually went on-the-ground, and location, number, size, and depth of test pits excavated and natural exposures examined. Describe the topographic setting, and relation to other physical features, such as lakes, streams, rivers, bluff, edges, nearby hills, elevation, etc., for sterile test pits.

Sites found in locale:

Number of shovel tests --

NAMES OF FIELD TEAM: (include relevant pages in fieldbook)

_____	Date _____	_____	Date _____
_____	Date _____	_____	Date _____
_____	Date _____	_____	Date _____
_____	Date _____	_____	Date _____
_____	Date _____	_____	Date _____
_____	Date _____	_____	Date _____

Appendix 3

SITE SURVEY FORM

AHRS NO.: _____
SURVEY LOCALE NO.: _____
UA NO.: _____

CHECKED BY _____ DATE _____

A. USGS QUAD: Talkeetna Mountains _____ Scale: 1:63,360
B. AIR PHOTO REFERENCE: Roll _____ Frames _____
C. TWP _____, RNG _____, Seward Meridian
_____ 1/4 of the _____ 1/4 of the _____ of Section _____
D. UTM: Zone 6 Easting _____ Northing _____
E. LATITUDE: _____ ° _____ ' _____ " LONGITUDE: _____ ° _____ ' _____ "
F. GEOLOGICAL UNIT: _____ No. _____
G. REGION: Devil Canyon _____ Watana _____ Other: _____

A. Site morphology. (See back of form for information required.)

6. Surrounding terrain morphology. (See back of form for information required.)

[illegible]

C. Ecosystem. (See back of sheet for descriptions.)
1. ☐ Moist Tundra ☐ High Brush ☐ Other: _____
☐ Lowland spruce-hardwood ☐ Upland spruce-hardwood

2. Site vegetation and surface description:

[illegible]

AHRS NO.: _____

III. SITE:

A. Description:

1. Characteristics. (lithic scatter, stratified site, cabin, etc.)

number of shovel tests

number of test pits

(indicate on map)

2. Number, size and spatial relationship of features, etc.

3. Stratigraphy (if relevant):

AHRS NO.: _____

B. Artifact inventory.

1. Surface:

a. Artifacts collected:

b. Artifacts observed but not collected:

2. Systematically excavated artifacts:

C. Period: Unknown Precontact

Historic: Native _____ Non-Native _____

D. Size:

1. Observed Size: _____ x _____ meters

Justification for boundaries:

2. Estimated Size: _____ x _____ meters

Justification for boundaries:

E. Site disturbance (current and anticipated). Indicate expected effect of the hydroelectric project on the site.

1. Natural:

2. Human:

A 18

F. What prompted you to survey this location?

IV. PHOTOGRAPHIC RECORD:

Frame #	Direction
---------	-----------

Site ID with date and Crew

[illegible]

A. Names:

_____ , _____ , _____
 _____ , _____ , _____
 _____ , _____ , _____

B. Date(s) visited: _____

II. A. Site morphology.

1. What terrain feature is the site on: flat plain, sloping plain, continuous ridge, hill, point, shoreline, terrace, valley, etc.
2. What is the topographic context:
 - a. no topographic relief relative to surrounding terrain, higher topographic relief than surrounding terrain, lower topographic relief than surrounding terrain.
 - b. give elevation: 1) above sea level; 2) Relative to surrounding terrain.
3. Is the terrain feature continuous or discrete?
4. What is the size, shape and direction of this feature?
5. What is the relative position of the site on this feature?
6. Field of view:
 - a. direction and range of view;
 - b. what is in view?
 - c. would a change in the present vegetation increase or decrease view? How?
7. Describe any special attributes that make this site location unique.
8. Are there other settings similar to that of this site in the unit? Where?

II. B. Surrounding terrain morphology.

Describe surrounding landforms and water features in relation to the site. What is the direction, distance and difference in elevation of surrounding features? The following characteristics should provide a guide:

1. Streams and rivers:
 - a. proximity to site
 - b. access from site
 - c. are any in view from site?
 - d. has downcutting created valley wall constriction in this area?
 - e. is stream or river (1) shallow with rapids and sandbars, or (2) deep and smooth in this vicinity, etc.
 - f. is water clear or turbid?
 - g. what is the general width in this vicinity?
 - h. is terracing present?
 - i. in this area is the river course:
 1. straight;
 2. bending;
 3. serpentine.
 - j. are confluences with other streams or rivers nearby? How far?
 - k. what kind of terrain does this stream or river drain? (lakes, hills, marsh)
2. Lakes:
 - a. size in hectares using template.
 - b. inlet present? outlet present?
 - c. single lake or part of lake system?
 - d. characterize terrain surrounding lake (low, wet, steep, etc.)
 - e. is there any evidence that lake size is changing (vegetation overgrowth, old shorelines, etc.)
 - f. characteristics of shoreline. Old shorelines present?

ECOSYSTEMS LIKELY TO BE ENCOUNTERED IN PROJECT AREA

MOIST TUNDRA: Moist tundra ecosystems usually form a complete ground cover and are extremely productive during the growing season. They vary from almost continuous and uniformly developed cottongrass tussocks with sparse growth of other sedges and dwarf shrubs to stands where tussocks are scarce or lacking and dwarf shrubs are dominant. Associated species are arctagrostis, bluejoint, tufted hairgrass, mosses, alpine azalea, wood rush, mountain-avens, bistort, low-growing willows, dwarf birch, Labrador tea, green alder, Lapland rosebay, blueberry and mountain cranberry.

HIGH BRUSH: These are dense to open deciduous brush systems. Floodplain thickets: The subsystem is similar from the rivers of the southern coastal areas to the broad-braided rivers north of the Brooks Range. It develops quickly on newly exposed alluvial deposits that are periodically flooded. The dominant shrubs are willows and alders. Associated shrubs are dogwood, prickly rose, raspberry, buffaloberry and high bush cranberry. Birch-alder-willow thickets: This subsystem is found near timberline in interior Alaska. It consists of resin birch, American green alder, thinleaf alder and several willow species. Thickets may be extremely dense, or open and interspersed with reindeer lichens, low heath type shrubs, or patches of alpine tundra ecosystems. Other associated species are Sitka alder, bearberry, crowberry, Labrador tea, spirea, blueberry and mountain cranberry.

UPLAND SPRUCE-HARDWOOD FOREST: This ecosystem is a fairly dense interior forest composed of white spruce, birch, aspen and poplar. Black spruce typically grows on north slopes and poorly drained flat areas. Root depths are shallow. Fire scars are common. White spruce averaging 40 to 80 feet in height and up to 16 inches in diameter occurs in mixed stands on south facing slopes and well drained soils; forms pure stands near streams. Aspen and birch average 50 feet in height. Poplar averaging 80 feet in height and 24 inches in diameter occurs in scattered stands along streams. Undergrowth consists of mosses with grasses on drier sites and with brush on moist slopes. Typical plants are willow, alder, ferns, rose, high and low bush cranberry, raspberry, current and horsetail.

LOWLAND SPRUCE-HARDWOOD FOREST: This ecosystem is a dense to open interior lowland forest of evergreen and deciduous trees, including extensive pure stands of black spruce. Black spruce are slow growing and seldom exceed 8 inches in diameter or 50 feet in height. Cones of this tree open after fire and spread abundant seed, enabling black spruce to quickly invade burned areas. The slow-growing stunted tamarack is associated with black spruce in the wet lowlands. It seldom reaches a diameter of more than 6 inches. Rolling basins and knolls in the lowlands have a varied mixture of white spruce, black spruce, paper birch, aspen and poplar. Small bogs and muskegs are found in the depressions. Undergrowth species include willow, dwarf birch, low bush cranberry, blueberry, Labrador tea, crowberry, bearberry, cottongrass, ferns, horsetail, lichens and a thick cover of sphagnum and other mosses. Large areas burned since 1900 are covered by willow brush and very dense black spruce sapling stands.

AFTER: Major Ecosystems of Alaska. Joint Federal-State Land Use Planning Commission for Alaska. July 1973.

Appendix 4: Terminology for Rock and Mineral Identification

Aphanitic refers to the texture of fine grained igneous rocks. Individual crystals are so small they cannot be detected without the aid of magnification.

Argillite is a sedimentary rock that is much harder and more dense than shale, which it resembles in origin, minerals, and general appearance. Its cement generally is silica. Although some argillites grade into slates and other shaly quartzites, they preserve varves, ripplemarks, mud cracks, and other sedimentary rock structures.

Basalt is characteristically black, dense, and massive. Individual crystals cannot be seen with the naked eye unless in phenocryst form. Phenocrysts are commonly pyroxene and olivine.

Chalcedony is a form of quartz that has a waxy luster; it is never crystalline but forms layers, stalactites or grapelike masses.

Chert is a very compact rock which consists chiefly or wholly of silica, though calcite and dolomite may be present in a very small amounts. The siliceous portion of chert may consist of chalcedony alone or of a mixture of quartz and chalcedony, the grain being so fine that it cannot be seen without high magnification. It is brittle and breaks conchoidally with a waxy or dull glassy luster.

Cryptocrystalline refers to the crystalline structure of a rock when visible

at high magnification only.

Crystalline refers to the texture of sedimentary rocks. These are formed from solutions and not sediments.

Groundmass is the fine grained matrix of a rock which may contain larger inclusions such as phenocrysts.

Luster refers to the appearance of light reflected from a mineral.

Obsidian is a massive volcanic glass. It breaks with conchoidal fracture and has a bright glassy luster.

Phenocryst is a distinctive crystal formed during the slower cooling period in igneous rocks.

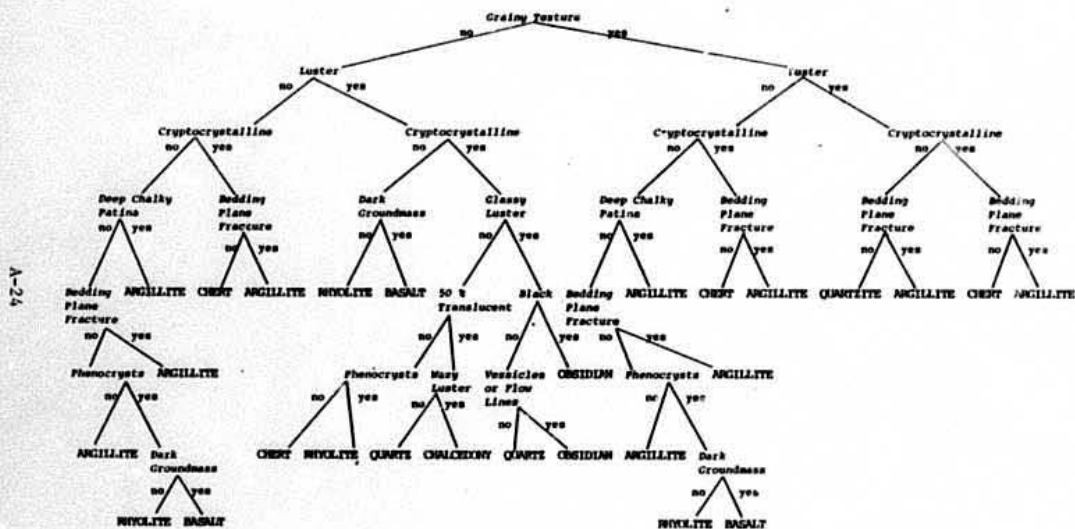
Quartz is a mineral, silicon dioxide. It will occur in hexagonal prismatic crystals and or in cryptocrystalline forms. It ranges from colorless to black and has a vitreous or glassy luster.

Quartzite is a nonfoliated metamorphic rock composed principally of quartz. In some deposits quartz is the only mineral present. The individual grains in quartzites are deformed, interlocked, and are fused together so the rock breaks across the grains. Pure quartzite is derived from quartz sandstone, but some quartzites may contain as much as 40% other minerals, mica being one of the most abundant.

Rhyolite is the microcrystalline extrusive equivalent of a granite formed at or near the surface. It is characteristically white, gray, or pink and nearly always contains a few phenocrysts of feldspar or quartzite (2-10%). Inasmuch as the texture is aphanitic, the only minerals that can be identified in a rhyolite hand specimen are those occurring as phenocrysts.

Tenacity is the resistance of a mineral to breakage.

Texture refers to the size, shape and boundary relations between adjacent minerals in a rock mass.



Appendix 6: Definitions of Lithic Artifacts:

Abrader: A coarse grain stone used for grinding and sanding.

Biface: A stone artifact bearing flake scars on both faces.

Blade: Specialized flake with parallel or sub-parallel lateral edges; the length being equal to, or more than, twice the width. Cross sections are plano-convex, triangulate, sub-triangulate, rectangular, or trapezoidal. Some have more than two dorsal crests or ridges. (1)*
[* See Notes at end of appendix.]

Blade Core: A nucleus or mass of lithic material often preformed by the worker to the desired shape to allow the removal of a blade. Piece of isotrophic material bearing negative flake scars or scar from the removal of blades. (1)

Burin: A chisel-like implement derived from a flake or blade; or the modification of other implements by using the burin technique to remove the edges parallel to their long axis and/or transversely or obliquely. Generally forms a right angle edge on one or both margins. (1)

Burin spall: A specialized flake removed from a burin core, generally rectangular in transverse section. The dorsal side of the blade generally shows a single blade scar with lateral margins at right angles. The first burin spall removed from the core may show numerous variants, depending on the type of material used and because it bears

scars of the worker's preparation to establish a ridge to guide the first blade. (1)

Cobbles and fragments: A rock or fragment of rock with a particle size between 65 mm and 250 mm. (2)

Flake core: A nucleus of stone bearing the scars from the removal of flakes either in a random or regular pattern.

Hammerstone: A natural rounded, largely unmodified pebble used as an unhafted hammer. Usually contains some evidence of a battered surface from percussion flaking.

Lanceolate point: A biface which contains a finished haft element characterized by roughly parallel sides from the base to near the tip.

Leaf shaped point: A biface which contains a finished haft element and contracting base. No shoulders are evident.

Microblade: A diminutive blade generally made by pressure technique. See blade. (1)

Microblade core: A wedge shaped nucleus of lithic material formed into a desired shape for the removal of microblades. Bears scars from the removal of microblades.

Microblade core tablet: A flake used to rejuvenate the platform surface on a

microblade core. The exhausted or ruined platform would be removed as a tabular flake thereby establishing a new platform.

Modified flake: A flake which has been altered in morphological form from its original shape. Modification can either be from use wear or from intentional retouch or from both kinds of alteration.

Notched pebble: Commonly a water rounded rock which contains two chipped notches roughly opposite each other. Thought to be a net weight or sinker.

Ochre: Iron oxide or hematite. Color is commonly reddish brown to yellow.
(3)

Preform: Preforming denotes the first shaping. Preform is an unfinished unused form of the proposed artifact. It is larger than, and without the refinement of, the completed tool. It has no means of hafting and generally made by direct percussion. (1)

Rejuvenation flake: To renovate, renew, restore, re-create, or re-establish. A flake which contains the exhausted or ruined platform of a blade or flake core. Usually removed in the same longitudinal direction of the failed flake or flakes. Not to be confused with microblade core tablets. (1)

Scraper: A tool presumably used in scraping, scouring, or planing functions.

Most frequently refers to flaked stone artifacts with one or more steep unifacially retouched edges.

Stemmed point: A biface which contains a finished haft element characterized by distinctive shoulders and a contracting base.

Thermally altered rock: Rock which has been split, cracked and/or damaged by heating and/or cooling. These may be angular with fire reddening or contain pitting. Not to be confused with thermal treatment which is a method of altering siliceous material by exposure to controlled heat. This treatment makes the stone more vitreous.

Triangular point: A biface which contains a finished haft element where the base is the widest point and the sides are progressively contracting toward the tip.

Unmodified flake: Any piece of stone removed from a larger mass by the application of force intentional or accidentally and not altered after removal. A portion of isotrophic material having a platform and bulb of force at the proximal end. The flake may be of any size or dimension, depending on which technique was used for detachment.

Notes:

1. Crabtree, D.E.

1972 An Introduction to Flintworking. Occasional Papers of the Idaho State University Museum, Number 28. Pocatello, Idaho.

2. Deeson, A.F.L.

1973 The Collector's Encyclopedia of Rocks and Minerals. Clarkson N. Potter, Inc., Great Britain.

3. Fladmark, K.R.

1978 A Guide to Basic Archaeological Field Procedures. Department of Archeology Simon Fraser University Publication Number 4. Burnaby, British Columbia.