

CHAPTER I
CULTURAL AND HISTORIC INFORMATION

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1.0 INTRODUCTION

In July 1988 personnel of the Northern Anthropology Consortium conducted a cultural resource survey of a proposed surface coal mine in the vicinity of Wishbone Hill, approximately seven miles north-northeast of Palmer, Alaska (Figure 1). Field work was preceded by a literature review and by consultations with cultural resource specialists at the Matanuska-Susitna Borough office and the State of Alaska Office of History and Archeology. The survey was conducted utilizing standard cultural resource site survey procedures. The results of the survey proved negative, in that no previously unknown sites were discovered.

2.0 AREA SURVEYED

2.1 LOCATION AND GENERAL DESCRIPTION

The area surveyed is located immediately southwest of Wishbone Hill on the north side of the Matanuska River (USGS 1:25,000 C-6 NW and NE Quadrangles; see Figure 2). The proposed coal mine will affect, in one way or another, the surface of an area stretching from the old Premier Mine on the west to just beyond the old Buffalo Mine on the east, and bounded by Moose Creek on the north and the Glenn Highway on the south.

2.2 TOPOGRAPHY

Along its northern boundary, the project area drops off sharply from a maximum elevation of 1,050 feet to the bed of Moose Creek at about 920 feet at the northeast edge of the property and 820 feet at the northwest corner. For a mile or so south from the creek in the northeast section of the property, the ground surface is gently rolling and from the air resembles a parkland. Farther south clear to the Glenn Highway, however, the topography is rendered exceedingly complex by a sinuous system of high eskers and dry basins or kettles. The western portion of the project area lies within a sweeping curve of Moose Creek; the topography here is also dictated by glacial features such as eskers and kettle basins.

2.3 FLORA AND FAUNA

The project area supports a mixed upland forest interspersed with previously disturbed lands. Large

trees include birches (Betula spp.), poplars, aspens, and cottonwoods (Populus spp.) mixed with conifers, mainly spruces (Picea spp.). Paper birch (Betula papyrifera) and quaking aspen (Populus tremuloides) mark the dry eskers and kames, well-drained rises where concentrated archeological reconnaissance took place. White spruce (Picea glauca), often an indicator of permanent surface lake shorelines, served as a marker of intermediate archeological site potential. Dwarfed examples of these tree species suggested poorly drained soils with low cultural resource potential.

Ground cover consists predominantly of fireweed (Epilobium angustifolium), cow parsnip (Heracleum lanatum), rose (Rosa spp.) high bush cranberry (Viburnum edule), blueberry (Vaccinium spp.) and grasses in the parklands and mixed forest. Well-drained hillocks and ridges often possess smaller berry-producing plants, such as low bush cranberry (Vaccinium vitis-idaea), bunchberry (Cornus canadensis), and crowberry (Empetrum nigrum). Poorly drained zones include numerous sedges (Carex spp.), grasses (Poa spp.), and cotton grass (Eriophorum spp.).

Alder (Alnus spp.) is usually a marker of watercourses, but this species is also an excellent indicator of disturbed zones. Much of the project area is covered with dense stands of alders, new growth following surface disturbance from earlier mining and exploration activities.

At least 134 species of birds, fourteen species of fish and twenty-eight species of mammals are presently known to inhabit the general vicinity (Alaska Department of Natural Resources 1986). The most important mammal species in the project area include moose, black bear, some fur bearers; fish known to be present in Moose Creek include Chinook salmon, Coho salmon, Dolly Varden and Rainbow trout; the bird species most commonly taken for food include the three species of ptarmigan and spruce grouse. Presumably all of these species would have been available for exploitation by the more recent prehistoric inhabitants of the area, and earlier peoples probably had substantially the same array of subsistence sources. Undoubtedly the most crucial resources over time have been moose and salmon.

3.0 THE CULTURAL HISTORY OF THE WISHBONE HILL REGION

3.1 ARCHEOLOGICAL RESEARCH

Archeological research in Upper Cook Inlet was pioneered in the early 1930's by Frederica de Laguna (1934, 1975). This early survey and testing program encompassed the present study area

and provided many of the basic data from which the accepted cultural chronology has been constructed. In 1965 and 1966 Don Dumond and Robert Mace (1968) conducted a survey along Knik Arm, in part to study the question of when the Dena'ina (Tanaina) Athapaskans arrived in the region. Additional sites of probable Dena'ina affiliation were located in a survey of the Willow and Wasilla districts by Douglas Reger (1980) in 1978. Several sites marked by house and cache depressions were located with the assistance of Native informants.

Several other impact and project specific archeological reconnaissances in the Cook Inlet region have been conducted in recent years (cf. Bacon 1974; K. Workman 1978; Veltre 1978; Holmes 1979, 1981; Yarborough 1979, 1980, 1981; Steele 1980; Gibson 1980; Lobdell 1981, 1983a, 1983b, 1983c, 1984, 1986, 1987; Yarborough and Yarborough 1981). None of these have disclosed any new evidence of historic or prehistoric sites in the lower Matanuska River drainage, although several recent discoveries of late prehistoric and historic period sites have been made to the west in the Susitna drainage. A combined program of aerial reconnaissance and limited ground survey has been completed for the Susitna River Basin (J. Dixon et al. 1982; U.S. Department of Agriculture 1983). Several sites of probable Dena'ina affiliation were located and historic non-Native cabins and trails recorded.

Finally, the various historic coal workings in the vicinity of Wishbone Hill have received the attention of historians and historic archeologists. Investigations pertinent to the project area are referenced below.

3.2 THE KNOWN PAST

Before Russian and American colonization, the Cook Inlet region was populated by two distinct ethnic and racial groups, Eskimo and Athapaskan. Archeological and historic accounts indicate that Eskimo peoples have long occupied lower Cook Inlet and, at various times in the past, inhabited the middle and upper reaches as well (Birket-Smith 1953; Kent et al. 1964; Dumond and Mace 1968; Reger 1973, 1974, 1977, 1981; G. Dixon and Johnson 1973; Boraas 1975, 1976; Reger and Antonson 1976). During later historic times, all but the outer fringe of the lower Inlet became the territory of the Dena'ina Athapaskans. For the earlier stages of prehistory, archeologists have encountered difficulty in distinguishing between the cultural debris left by the Eskimo and Athapaskans, and this has prevented a clear understanding of the diachronic development of these two distinct populations.

While it is possible to construct a speculative ethnic history, the prehistory of Cook Inlet may also be viewed from an environmental perspective. Developments and changes in the lives of the prehistoric peoples of the area were made in response to a number of influential factors, including environmental ones. On a regional scale such developments are reflected in the archeological record by changes in types, kinds, and frequencies of artifacts and features. When correlated with suspected climatic fluctuations and changes in the ecological setting of the area, such data are a record of the changing subsistence strategies of the peoples who used them. From this type of evidence archeologists have proposed a number of stages to identify past levels of technological development, adaptive subsistence strategy, and levels of sociocultural integration characteristic of prehistoric and historic populations in the Cook Inlet region.

Establishing any cultural chronology for the area depends upon the comparison of archeological components through radiocarbon dating, by stratigraphic relationships, and by the typological comparison of artifacts from undated collections (Reger 1981). This information may be used to group the cultures of the Cook Inlet region on the basis of broad artifactual and temporal similarities into a series of cultural stages through time. The stages provide a framework in which to examine cultural and environmental relationships, given the limited data available for some time periods. Undoubtedly, temporal spans of the archeological complexes, components and horizons vary within the region, and dates given here are estimates of probably cultural duration in the vicinity of the proposed mine complex. A historic record is constructed through examination of explorer's maps, Dena'ina place names, primary and secondary historic accounts, and other pertinent land use information.

3.2.1 Early Prehistory

Because no prehistoric sites are known in the immediate project vicinity, it is necessary to expand the cultural setting to adjacent territory in order to understand potential cultural affiliations and prehistory of the general area. The earliest human records in the Cook Inlet region are from the Beluga Point site situated on a rocky point overlooking the north shore of Turnagain Arm (Reger 1977, 1981). A complex of artifacts typified by a core and blade technology, with affinities to the American Paleoarctic tradition dating from 8,000-10,000 years ago, was recovered from the lowest levels of this site. Technologically similar material has been recovered from the Long Lake Wayside site in the Matanuska River Canyon, and from several other nearby lakeside sites (G.

Dixon and Johnson 1973; Bacon 1978). The presumed comparative dating of cultural debris consisting of cores, blades, and bifacial knives or projectile points also relates the Long Lake Wayside complex of material to the early period of prehistory (also see West 1975).

The American Paleoarctic tradition cultures are those which existed after the end of the last glacial epoch (Hopkins et al. 1982). Although not extensively documented, research indicates that environmental conditions in early post-glacial times differed from those of today (Heusser 1960; Stanley 1980). Much of southcentral Alaska appears to have been a tundra landscape during this period of time. The limited evidence available suggests that the peoples of the American Paleoarctic tradition were well adapted, through the hunting of large land mammals and the use of a variety of secondary resources, to what must have been a challenging environment.

A second component dating earlier than three thousand years BP is represented at Beluga Point. A relatively substantial array of material consisting of stemmed projectile points, lanceolate points or knives, chipped shouldered knives, stone blades, unifacial scrapers, and a burin form not formally described elsewhere in Alaska, was recovered from the level representing this time period (Reger 1977, 1981). Because of the unusual nature of this collection of artifacts, cross-cultural comparisons are difficult to make. Stylistically similar types are known from the Alaska Peninsula, Kodiak Archipelago, and Lake Iliamna regions (Townsend 1970; Dumond 1971; G. Clark 1977). More attenuated relationships are suggested by comparisons to the interior of Alaska, specifically the Healy Lake site (Reger 1981).

Climate and habitat states during this time period were probably similar to those present today, with white and Sitka spruce invading the region for the first time (Heusser 1960). There is evidence that sites were located to take advantage of both marine and riverine resources (Dumond 1977). Caribou appear to have been hunted to a lesser extent than before, probably because of a decline in suitable game herd habitat (G. Clark 1977). Speculating on the ethnic identity of those responsible for the two early components from Beluga Point, Reger (1977) has suggested that the assemblages represent an early occupation of Cook Inlet by interior, possibly Athapaskan speaking, peoples.

3.2.2 Middle Prehistory

An intermediate period of prehistory is represented at Beluga Point by two components dating from 1,500-3,000 years ago. A Norton-related component is characterized by ground slate points, small

bipointed end blades, polished facet burinlike groovers, and a steeply retouched scraper on a blade-like flake (Reger 1981). Stylistic similarities to both Denbigh Flint Complex and Norton cultural material suggest that this component represents an early intrusion into the Cook Inlet area, possibly by Eskimos from elsewhere in Alaska (Giddings 1964; Reger 1981). The development of this phase at Beluga Point appears to have been hampered by influences from other North Pacific Eskimo groups. In particular, the Kachemak tradition may have limited the diffusion of cultural traits from Norton sites in the Bristol Bay region (Dumond 1971; Reger 1977, 1981; W. Workman et al. 1980). Some Kachemak cultural traits are recognized from localities on the west side of Knik Arm to the southwest of Palmer (Dumond and Mace 1968).

Although less defined, a fifth component from Beluga Point, consisting of a small series of projectile points and point fragments, may also be assigned to the middle period of prehistory (Reger 1981). The temporal assessment of this complex is based on stratigraphic considerations, the presence of slate artifacts--a chronological indicator for the area--and on stylistic comparisons to the 2,500 year old Chagvan Bluff site from the Bristol Bay region (Ross 1971).

There is evidence that these peoples practiced an adaptive strategy oriented toward the seasonal use of both riverine and interior resources. The coastal Beluga Point site may have been strategically located for the exploitation of anadromous fish populations and estuarine resources as well. Because of the unsuitability of Upper Cook Inlet for an exclusively maritime cultural adaptation, the inhabitants appear instead to have taken advantage of the opportunities afforded by localized ecological situations and developed microenvironmentally specific subsistence patterns during this period of time.

3.2.3 Late Prehistory

The late prehistoric period began about one thousand years ago and ended in the latter half of the 18th century. While the most accepted scenario is still subject to interpretation, this period probably witnessed the arrival and growth of an Athapaskan tradition in Upper Cook Inlet. However, late prehistoric sites are not extensively documented in the region.

The Beluga Point site possesses a final prehistoric component dating from 600-800 years BP, but it is difficult to establish close relationships to other areal sites (Reger 1981). Although stylistic similarities invite comparisons to late period sites from Kodiak Island (Heizer 1956; D. Clark

1968), the Alaska Peninsula (G. Clark 1977), and Prince William Sound (de Laguna 1956), the presence of native copper elements in the Beluga Point collection could indicate contact with interior Athapaskans (W. Workman 1977). Several other localities throughout the Susitna Valley have presumed late prehistoric affiliations (Reger 1980; U.S. Department of Agriculture 1983), and the Fish Creek site on the west side of Knik Arm demonstrates a human occupation record beginning about 1,000 years ago and ending as recently as 300 years ago (Dumond and Mace 1968).

Climatic and ecological conditions during late prehistoric times approximated those of the present. Final establishment of modern forest vegetation, however, further reduced available caribou habitat, encouraging the development of subsistence patterns oriented toward seasonal use of riverine and marine resources (Reger 1981). The Dena'ina pattern of land use observed in the recent past may reflect this same strategy.

3.2.4 Early History

At the time of initial European contact the Wishbone Hill territory was controlled by the Dena'ina, an Athapaskan Indian people. The Dena'ina hegemony over Upper Cook Inlet may have been established as little as a century earlier, following a displacement of the Eskimo cultures who had forayed into the region from more distant population centers (Dumond and Mace 1968). The first European record of contact with the Dena'ina was that of Captain James Cook who traveled into the Upper Inlet in 1778 in search of the Northwest Passage (Cook and King 1785). In 1794 when Captain George Vancouver journeyed to Upper Cook Inlet, the Dena'ina were centered in at least five major villages. Previous, but undocumented, contact between the Dena'ina and the Russians had already occurred:

"Here we were visited by two natives in a small skin canoe These people appeared to be acquainted with the Russians of whose language they seem to speak several words ..." (Vancouver 1798).

The Russians referred to by Vancouver were probably traders who had ventured north from a settlement at the mouth of the Kasilof River that had been established in either 1786 or 1787 (Bancroft 1886; Federova 1973). Dena'ina population numbers during the early historic period can only be estimated, especially since the early writers failed to include a number of peripheral villages, but Lisansky's figure of 3,000 in 1805 and Kostlivtsov's figure of 1,471 in 1818 provided a

reasonable estimation (Osgood 1966).

Unlike other Athapaskan groups occupying the interior during this period, the Dena'ina were adapted to a maritime lifeway that included an emphasis on sea mammal hunting (Osgood 1966; VanStone 1974). The use of rivers and small streams with predictable runs of anadromous fish, coupled with sea and land mammal hunting, fostered the economic stability necessary for semi-permanent coastal villages. Fishing was a primary subsistence pursuit among all of the Dena'ina groups with salmon being the prime resource exploited (Reger 1981). Using a variety of rather sophisticated methods and techniques, the Dena'ina also congregated seasonally along the coast for the hunting of seals, beluga whales, sea lion and sea otters. Some of the equipment used in these maritime subsistence activities appears to have been copied from the southern Eskimo cultures, continuing the tradition of contact between the two groups in the Cook Inlet region (D. Clark 1971). Resources of the interior, including moose, caribou, mountain sheep, bear, and several small fur bearers, were hunted extensively and comprised an important component of the early historic Dena'ina economy. Both Osgood (1966) and Kari and Kari (1982) have documented the extent to which the use of coastal and interior habitats were integrated into the Dena'ina pattern of land use.

Although the locales of several protohistoric, contact period, or historic Dena'ina sites are well known, they have not been scrutinized in Upper Cook Inlet. Point Woronzoff, a possible protohistoric site consisting of house and cache depressions, is apparently of Dena'ina affiliation and may have been unoccupied for as much as two hundred years (Cook Inlet Native Association 1975). Limited testing has produced much recent historic material of little cultural resource value (K. Workman, personal communication). However, this locality remains to be extensively tested (Reger and Hannibal 1975; Rabich 1976; Lobdell in U.S. Environmental Protection Agency 1982). Other sites, such as Cottonwood Creek and Fischer-Hong, located on Knik Arm have produced traditional artifacts with items of European manufacture (Dumond and Mace 1968). Most of the recorded contact period sites in Upper Cook Inlet are represented by large house and cache pits, but a paucity of artifacts (Reger 1981). These sites are important for the information they can provide on settlement patterns and site location, even if material culture remains are not extensive.

It is apparent from the ethnographic data and from the limited evidence of historic period site locations that the Dena'ina preferred localities of coastal or riverine environments. Inland lakes, especially those situated at the confluences of clear water tributaries, were also favored locations for settlement and may have been preferred for winter quarters. Although the Dena'ina subsistence

pattern required the utilization of interior areas as well, upland sites (place names excepted) are not widely known.

In the late nineteenth and early twentieth centuries, the upper Cook Inlet region of Alaska was occupied by several regional bands of Dena'ina Athapaskans. The territory around Knik Arm and the Matanuska River drainage was home to the K'enaht'ana regional band. However, many of the places in this area have both a Dena'ina and an Ahtna name (Kari and Fall 1987: 255), reflecting close association between the Upper Inlet Dena'ina and the Ahtna. Apparently, the Ahtna have moved the territory that they exploit west and northwest during the past 150 years, so that the Chickaloon and Oshetna areas, formerly Dena'ina, have been used mainly by the Ahtnas since the mid-nineteenth century (see Kari 1977). According to Fall (1987: 21-25):

"With each regional band were several villages, each containing multi-family dwellings called nichil. The houses contained groups of kin - usually men of the same clan, their wives, and children. Leading each nichil or group of nichil was a qeshqa 'rich man'. The qeshqa organized his ukilaqa 'clan helpers' into cooperative hunting and fishing groups. In addition to this economic role, qeshqa instructed the young, settled disputes, and organized warriors for battles with the Ulchena (Alutiiq, or Chugach Eskimo). The village served as a base for the Dena'ina's resource harvesting activities. It was occupied for much of the year and contained many caches of preserved food.

The annual cycle of the K'enaht'ana of Knik Arm and the Matanuska and Knik River drainages was generally like that of the Susitna River Dena'ina. Some Knik Arm people traveled to the mouth of the Susitna River in spring to harvest hooligan, seal, and waterfowl. Others traded with the Susitnuht'ana [lower Susitna River people] for hooligan at Dilhi Tunch'del'usht Beydegh 'Point Where Hooligan Are Transported' (Point MacKenzie). Many K'enaht'ana moved from their winter villages to lower Knik Arm, including the present-day Anchorage area, in April and May to harvest king salmon with dip nets ... Later in the spring and summer, sockeye and silver salmon were available in many Knik Arm tributaries. The Knik Arm Dena'ina caught these fish in basket traps and with weirs and dip nets. They stored dried salmon in caches near the winter villages.

Like the other regional bands, the K'enaht'ana hunted primarily in late August and September. Some Knik River and Eklutna people journeyed into the Chugach Mountains for sheep, bear, ground squirrels, and probably caribou. Other Knik Arm Dena'ina hunted caribou in the Talkeetna Mountains. They traded caribou meat and hides with the Tubughna [from the Tyonek area], receiving dried fish and marine mammal products in return ... Early winter, from November to January, was usually a period of rest in the winter villages ... People visited other communities, traded,

told stories, and held potlatches. Hunting partners made short trips of one to several days for moose, bear, ptarmigan, hare, and porcupine to supplement the diet of dried fish, meat and oil. Fresh fish, mostly trout, were harvested through the ice of local lakes. Furbearers, such as marten, were harvested for raw materials, potlatching and trade. If food supplies ran low in January, February, or March, village groups sometimes dispersed to lakes in new hunting and fishing areas. Specially trained dogs were used to seek out brown and black bear dens. In April, with the anticipated return of waterfowl, hooligan, marine mammals, and salmon, the sparse season ended and the seasonal cycle began again.”

While both the K'enaht'ana and Ahtna utilized the project area and immediate surroundings, little information is available on specific use localities. Kari and Fall (1987:259-60) list only a few place names for the area:

Chidaq'atnu (K'enaht'ana); Tsidek'entna' (Ahtna)
'Grandmother's Place Creek'
Moose Creek, formerly called Tsadaka Creek

Glenn and Abercrombie (1899:199): "Above Moose Creek on our [north] side of the Matanuska was an old camping place of the Matanuskas used in their journeys up and down the river."

According to Johnny Shaginoff and Katie Wade, there are burials on both sides of the mouth of Moose Creek. Some graves have washed out. Several people died here during the 1918 flu epidemic.

Johnny Shaginoff says a trail led up Moose Creek and over the mountains to the upper Kashwitna River. The Larsons from Talkeetna used to travel this trail.

Chidaq'ashla Bena
'Lake of Grandmother's Little Place'
Wishbone Lake

Chidaq'ashla
'Grandmother's Little Place'
Wishbone Hill

Katie Wade says this is thought of as a dangerous area. Many hunters have gotten lost here. A giant with feet that are turned backwards is said to have lived in the area.

Ts'es Tuk'ilaght (K'enaht'ana); Ts'es Tac'ilaexde (Ahtna)
'Where Fish Run Among Rocks'
Eska Creek, Sutton

The Chickaloon Ahtnas did not spend much time salmon fishing. Some salmon were harvested here and at a small stream now called Mile Seventeen Creek. Johnny Shaginoff says that the salmon are good only the first two or three days of the run. In the past, people used salmon from the Eska area mainly as dog feed. The people in this area obtained dried salmon through trade with the people downstream

The only additional information that we obtained on usage of the area's resources was the report that Katie Wade once had a seasonal camp at the mouth of Moose Creek (P. Willingham, personal communication).

No known late prehistoric, early historic or modern cultural resource sites attributable to the activities of K'enaht'ana or Ahtna peoples are known to exist in the immediate project area, though there seems little doubt that the general area and its resources were important to these groups. Evidence of past usage may still be present outside the project area, at the mouth of Moose Creek, for example, but such potential sites along the Matanuska River are beyond the scope of this study.

3.2.5 Recent History

By the closing decades of the 18th century, the first significant Russian colonies had been established in the Cook Inlet region. The northward expansion of the Russian frontier from the Aleutian Islands was initially stimulated by an interest in the furs of Cook Inlet and coal and minerals of the Kenai Peninsula. However, because the climate was more temperate around Cook Inlet than in other parts of Russian America, the agricultural potential was also recognized and the first Alaskan farms were established here by the Russians (Tikhmenev 1978). By 1844 agricultural colonies had been founded near the modern towns of Knik, Kenai, Kasilof and Seldovia (Federova 1973).

The Russian colonial period was also marked by the activities of the Russian Orthodox Church in southcentral Alaska. In 1841 the Russian American Company built a chapel and dispatched a priest to Kenai. The Kenai Parish priest was responsible for the entire coast of southcentral Alaska (Porter 1893).

The extension of American influence into Upper Cook Inlet began with the advent of trading and mining activities in the late 1800's. Trading Bay, located at the mouth of Nikolai Creek, was so named in 1786 because of the considerable success enjoyed by Captain Portlock in trading with the Natives here (Bancroft 1886). Besides engaging in direct trade, the local Dena'ina were also employed to transport goods and provide meat, fish and furs. Native women produced fur garments and gathered large quantities of berries for sale (Potter 1967). Early fur trade on Cook Inlet centered on the major river systems that served as natural transportation corridors and provided accessible locations for the construction of trading stations.

The first permanent American trading posts were established in the Upper Cook Inlet region in the 1870's. Although several firms were involved in the trading business in the early years, the Alaska Commercial Company (ACC) became the most important after 1875. Western goods were exchanged for a wide variety of furs including land otter, beaver, black fox, marten, mink, black bear, brown bear, wolverine, wolf and muskrat (Bacon et al. 1982).

The major gold rush in southcentral Alaska was to the Turnagain Arm region on the northern end of the Kenai Peninsula in 1895-1896. During this period traffic through the Upper Inlet was heavy and the Turnagain Arm stampede may have brought as many as 3,000 would-be gold seekers to Upper Cook Inlet (Moffit 1906).

Gold precipitated the initial stampede, but coal was the most important local resource and held the greatest potential for the mining industry of the future around Upper Cook Inlet. Coal seams were widespread on the western coast and each year 400-500 tons of low grade lignite were taken for domestic purposes and to fuel steamboats traveling through Upper Cook Inlet (Atwood 1909). It has been suggested that the Dena'ina originally learned to burn coal from the Russians (Kari and Kari 1982). Although large scale development of the region's coal resources was not planned until recently, several small coal mines were reported to be working in the Yentna district in the early 1900's.

The history of the Moose Creek coal deposits begins near the turn of the century with reports by prospectors and Indians of coal resources. Lieutenant Castner's exploration into the interior from Upper Cook Inlet, which traversed Moose Creek on July 19, 1898, included a party geologist (Woodman 1984). Concentrated exploration efforts in search of coal by geologists began about

1904 and continued for about a decade, resulting in numerous survey reports and early maps of reserves (Bauer and Cole 1985).

The history of coal mining throughout Alaska is rife with ventures and failures. Coal lands in the Matanuska area were finally opened by the Federal government for lease in 1916. Access into the Matanuska Coal Fields was completed in 1917, but the route ascending Moose Creek was not finished for another six years. The Wishbone Hill area was the focus of intensive coal mining activity in the years following 1917 (see Bauer and Cole 1985 and sources quoted therein). The legacy of this activity was apparent as late as 1981 in the form of structures and heavy equipment associated with the various coal mines in the project area. Three mines operated there: Premier (Alaska Heritage Resource Survey site number ANC-475), Buffalo (ANC-439) and Baxter (ANC-476). The Baxter Mine was one of the earliest in the area, with the commencement of coal shipments in 1917. Coal was worked predominantly in the winter months so that it could be sledded to the main Matanuska Branch of the Alaska Railroad. A narrow-gauge spur ascending Moose Creek reached this operation in October of 1923 (Bauer and Cole 1985). The first mining operation at the Premier Mine began in 1922.

At present, the three early mines constitute the recognized archeological and historical sites in the project area. Craig Mishler, of the State of Alaska Division of Geological and Geophysical Services, reviewed the Premier and Buffalo Mines to determine the possible significance of the cultural materials remaining on-site (Mishler, site inspection forms). He did not assess the Baxter Mine site and it may be that evidence of the activities that once occurred there had been destroyed by 1981 as a result of expanding the Premier Mine pit. Mishler's descriptions of the Premier and Buffalo Mine areas are as follows:

Date:	14 August 1981
Name of Site:	Premier Mine
Geographic Location:	3.9 miles on Buffalo Mine Road after turning off at Mile 53 Glenn Highway north of Palmer. No sign at entrance to mine. (NW1/4 SE1/4, Sect.28, R2E, T19N, Seward Meridian).
Vegetation/Topography:	Little vegetation. Flat gravel and crushed coal over site. Mining is by stripping method on opposite side of Moose Creek [from buildings]. Elevation of several hundred feet below Buffalo Mine Road.

Condition: Largely rebuilt since 1971.

Description and Significant Features: Seven buildings (workshop, toolshed, etc.), large number of heavy equipment vehicles, old machinery (hopper, steam hoist, spare bridge, etc.), tools, etc. Very complex site.

Person Interviewed about Site: Paul Omlin (owner since 1960).

Date: 27 August 1981

Name of Site: Buffalo Mine

Geographic Location: East bank of Moose Creek. Approximately 1 3/4 miles upriver from Premier Mine. No longer accessible from Buffalo Mine Road due to bridge washout. (NW1/4 SW1/4, Sect. 23, R2E, T19N Seward Meridian).

Vegetation/Topography: Young cottonwood trees growing around buildings. Structures also on creek flood plain.

Condition: All structures in partial or full collapse except high-gabled log house and frame building next to winch platform.

Description and Significant Features: Five buildings, winch platform (apparently once housed under a roof), pile of collapsed saw timbers, collapsed drift portal, numerous steel rails strewn along dry creek bed. All buildings frame except log house.

Persons Interviewed about Site: Katherine Wade and David Kepler.

4.0 THE FIELD SURVEY

4.1 DATES AND PERSONNEL

Field work for the Wishbone Hill cultural resources site survey commenced on 8 July 1988 and extended through 12 July. Additionally, archival research was conducted in Placitas, NM,

Brockport, NY, and Anchorage, AK, prior to and after the field work. Field personnel included John E. Lobdell (Co-director), Edwin S. Hall, Jr. (Co-director), Pete Zollers, and Cruse Lopez. Lobdell and Hall were responsible for the archival research.

4.2 FIELD ACTIVITIES

Field activities are summarized below:

<u>Date</u>	<u>Personnel</u>	<u>Activity</u>
7/7/88	JL, EH	Arrive in Palmer.
7/8/88	PZ, CL	Arrive in Palmer.
	All	Visit project office and discuss proposed activities with project management personnel.
	All	Visit Matanuska-Susitna Borough to discuss cultural resources in the Wishbone Hill area with Pandora Willingham. Visit project area to make preliminary assessment of Premier Mine, Omlin Strip Mine and Baxter Mine locales in terms of remaining cultural debris and extent of alterations to original land surface.
	All	Return to project office for further discussions and acquisition of maps and other data.
7/9/88	JL, EH, CL	Helicopter survey of project area. Aerial photographs.
	All	Preliminary survey of ridge edge along the south side of Moose Creek in an attempt to isolate areas retaining undisturbed original ground surface.
	All	Visit Buffalo Mine to make preliminary assessment of locale in terms of remaining cultural debris and extent of alterations to original land surface.
	All	Preliminary survey of broad ridge extending down toward Moose Creek from Wishbone Hill on east side of Buffalo Creek in an attempt to isolate areas retaining undisturbed original ground surface.

	All	Visit east portion of project area to make preliminary assessment of Eska locale in terms of remaining cultural debris and extent of alterations to original land surface.
7/10/88	All	Visit Buffalo Mine area to document cultural debris remaining on-site.
	All	Excavate several test pits and examine road cuts along face of Wishbone Hill to east of Buffalo Mine.
	All	Excavate several test pits and examine road cuts along crest of broad ridge extending down toward Moose Creek from Wishbone Hill on east side of Buffalo Creek.
	All	Excavated two test pits in possibly undisturbed area on crest of ridge overlooking bend of creek where Moose Creek turns (from easterly course) to flow south.
	All	Examine road cuts in two locales where road running south through project area cuts across eskers.
	All	Examine road cuts/road bed and excavate two test pits along 1.5 miles of road running down crest of esker extending northwest-southeast across southern portion of project area.
	All	Excavate test pit in area of possibly undisturbed ground at west end of Omlin Strip Mine.
	PZ, CL	Return to Anchorage.
7/11/88	JL, EH	Visit project office to acquire data on vegetation and geology.
	JL, EH	Visit Eska Mine area to further assess locale in terms of remaining cultural debris and extent of alterations to original land surface.
	JL, EH	Visit The Alpine Historical Society in Sutton to ascertain what mining equipment the Society has from mines in project area.
	JL, EH	Visit Matanuska-Susitna Borough to discuss results of

cultural resource site survey in the Wishbone Hill area with Susan Lee and secure additional pertinent documents.

7/12/88 JL, EH Return to Anchorage.

4.3 FIELD METHODS

4.3.1 Archival Research

Prior to initiation of field work, both Hall and Lobdell consulted their extensive libraries of published and unpublished information on cultural resource sites in the general vicinity of the project area. Lobdell also called upon the expertise gained during several other cultural resource surveys in the Cook Inlet area in order to formulate a preliminary assessment of the types of sites that might be found in the project area, the environmental conditions under which such sites might occur, and the best methods to locate and identify them.

Once in Anchorage, Lobdell visited the State of Alaska Office of History and Archeology and consulted with archeologists there who have worked in southcentral Alaska and are familiar with cultural resource sites in the general project area. He also reviewed the Alaska Heritage Resource Survey site files to determine if any prehistoric or historic sites had been reported in the project area. The only cultural resource sites noted in the project area were the three historic coal mines mentioned above.

Additional information on the cultural resources of the Wishbone Hill area were secured through discussions with cultural resource specialists at the Matanuska-Susitna Borough. While no further sites were added to the list of those known for the project area, additional sources documenting the history of the local coal mines were made available as were the names of several individuals knowledgeable about human utilization of the area's resources.

4.3.2 Determination of Project Scope

Several times during the course of the field survey, discussions were held with Jim Helling (Manager, Environmental/Permitting) and David Germer (Project Geologist) for Idemitsu Alaska, Inc. The purpose of these conferences was to delimit as accurately as possible the portion of the project area where the ground surface would be affected by the construction of the mine and attendant facilities and by subsequent operation of the mine. Germer also was able to provide some additional data on the historic mines in the project area.

4.3.3 Aerial Reconnaissance

Early in the field session, Lobdell and Hall reviewed the entire project area from the air in a helicopter that, under their direction, made numerous passes over the proposed coal mine. In addition to photographing the project area using both color and black-and-white film, they reached several conclusions based on the aerial observations:

1. Given an analysis of cultural resource site locations elsewhere in southcentral Alaska, coupled with the apparent height and configuration of the bluffs overlooking Moose Creek to the north, as revealed by USGS contour maps, we had assumed that the bluff edge possessed the highest cultural resource site potential in the project area. The aerial survey quickly revealed that both the present height and the present configuration of the bluffs is a function of strip mining activities that occurred prior to production of the USGS map.
2. The extent of profound ground surface disturbance was considerably greater than we had anticipated. Agents effecting major ground surface disturbance appeared to have been coal strip mining and creation of unimproved and secondary roads.
3. The most extensive and most severe ground surface damage was at locations that we identified as having the highest cultural resource site potential: the bluff edge, the banks of Moose Creek in the area of the Premier Mine, and the tops of the highest prominences in the esker system.
4. There were very few, if any, locations that might be considered to have even moderate cultural resource site potential which did not appear to have suffered moderate to severe disturbance. It was apparent that we would have to search at length for locations possessing moderate site potential which had not been impacted by historic or recent human activity.
5. We had expected to see old buildings and equipment at the three historic coal mines listed in the Alaska Heritage Resource Survey sites files. However, very little evidence of the major coal mining operations that occurred at these locations was visible from the air.

Analysis of the observations made during the aerial survey suggested that the portions of the project area which might once have possessed high potential for cultural resource sites were now severely disturbed and that even undisturbed areas of moderate potential would be difficult to locate.

4.3.4 Vehicle Reconnaissance

Numerous secondary and unimproved roads cross the project area. Some of these roads presumably were created during the early coal mining days while others were being forged by test drill rigs even as the archeologists worked in the area. Today the roads provide access to the project area and the flanks of Wishbone Hill to the west for hunters, wood cutters, and campers with recreational vehicles. During the course of the archeological survey, each of these roads was traveled by car at least twice. The initial pass down each road was for the purposes of gaining general familiarity with the area, identifying locations with medium to high archeological potential for later testing, and isolating road cuts that could be examined for cultural material. Subsequent trip(s) down each road were dedicated to scrutinizing road cuts, testing where appropriate, and confirming our original impressions of local archeological potential.

4.3.5 Ground Survey

Where practical, those locations within the project area believed to have the highest archeological potential, based on the factors discussed above, were examined on foot. In particular, we walked along the bluff edge at the northern edge of the project area, searching for undisturbed ground, and along the 1.5 mile length of the road that traverses the top of the longest and highest esker in the project area. More limited reconnaissances on foot were made elsewhere when circumstances suggested the (remote) possibility of encountering cultural remains. Additionally, the Buffalo Mine area was briefly examined to determine if significant historic materials were still present.

4.3.6 Testing

Testing activities were confined to localities possessing moderate to high archeological potential and where the ground surface was believed to be undisturbed. The localities tested included the following:

1. several small flat benches along the face of Wishbone Hill to east of and above the Buffalo Mine.
2. the crest of a broad ridge extending down toward Moose Creek from Wishbone Hill on east side of Buffalo Creek.
3. the crest of the ridge overlooking the bend where Moose Creek turns (from easterly course) to flow south.
4. the crest of the esker (towards its southern end) extending northwest-southeast across the southern portion of project area.
5. area of possibly undisturbed ground on bluff edge at west end of Omlin Strip Mine.

Additionally, the presence of road cuts throughout the project area permitted inspection of subsurface deposits in numerous places without the excavation of a test pit. Most of these road cuts were located where roads crossed or ran along the esker systems.

Test pits were excavated with shovel and trowel down to bedrock, till or mineral soil. The profiles exposed in the pits were very similar, differing only in the thickness of individual layers; a typical profile exhibited 4 inches of organic material with roots, a thin (less than 1/2 inch) layer of volcanic ash, and 20 inches of orangish loess overlying till.

5.0 RESULTS

No previously unknown cultural resource sites, either prehistoric or historic, were located as a result of the archeological survey. All of the cultural material discovered during the field survey was either associated with historic mining activities in the area (large boilers, railroad rail, cables, etc.), or with recreational use (shotgun shells, plastic button, pocket knife, etc.).

To a certain extent, the failure to find prehistoric sites was not unexpected. Available evidence indicates that the resource potential of the immediate project area has been relatively limited in the recent past, a situation that may well have some antiquity. The three major subsistence resources available in the general Wishbone Hill area over time would have been caribou, moose and salmon. Caribou do not utilize the project area today, though they may have been available in limited numbers at certain periods in the past. Moose have probably always been relatively common, but no more so than in areas closer to major drainages supporting a wide variety of other resources. Both escapement data (Alaska Department of Natural Resources 1986) and ethnographic testimony

(Kari and Fall 1987) indicate that salmon were neither particularly common in the streams immediately adjacent to Wishbone Hill nor particularly desirable as human food when available.

Nor does the topography of the area lend itself to resource procurement. A waterfall prevents most salmon from ascending Moose Creek as far as the project area. Only the bluff edge and the long esker extending northwest-southeast across the southern portion of project area provide reasonable lookouts, and even in these cases the view is relatively restricted. Elsewhere in the project area, rolling hills or low eskers would have hindered hunting activities.

The apparent general undesirability of the eastern Wishbone Hill area from the viewpoint of prehistoric hunting peoples, and the historic/recent destruction of the original ground surface in the precise locations where evidence of past human activities might be expected if such exist in the study area, lead to the conclusion that the proposed strip coal mining operation will not adversely affect known or unknown prehistoric cultural resource sites.

The situation with historic cultural resources is slightly different in that significant historic cultural resource sites may have existed in the project area but all available evidence suggests that cultural values inherent in these sites have been destroyed. The Baxter Mine apparently was destroyed by expansion of the Premier Mine pit. The Premier Mine was operated by Paul Omlin from 1960 until the 1970's; by the time the mine facilities were reviewed by State of Alaska Division of Geological and Geophysical Services personnel in 1981 for the presence of significant cultural materials (see above), Omlin had rebuilt many of the buildings, though old machinery was still present. Subsequently the mine facilities were razed and the machinery removed, apparently by Omlin.

Work at the Buffalo Mine site began in 1939, with exploration of the deposit extending through 1942. During the succeeding three years an active mining community developed at the site. Operations were discontinued around 1945 and resumed in 1952 under new management with the aid of the Reconstruction Finance Corp. However, all operations ceased in 1953 (Warfield 1962). When Craig Mishler, of the State of Alaska Division of Geological and Geophysical Services, reviewed the site in 1981, most of the buildings and associated machinery were still present, though the structures had collapsed and the machinery was in disrepair. A more detailed review of the site conducted in 1984 by Woodward-Clyde Consultants/Goodson & Associates (1984:5-14) described even more features and resulted in the conclusion that:

"At present a number of historic structures and features have been identified at the Buffalo Mine site (e.g., collapsed log cabin, engineers office, collapsed loadout chute, hopper, screening house, hoist house, power house, mess hall, quonset huts), and other historic archeological features may occur at the site. Based on a preliminary reconnaissance of the site by cultural resource specialists, and in consideration of Section 110(a) (2) of the National Historic Preservation Act, these structures and features are evaluated as being likely to be of significance and eligible for the National Register of Historic Places. Several of the structural elements and/or pieces of equipment may have enough structural integrity to be conserved in place or at a separate location for public historical interpretation; all of them together appear likely to yield information important to the interpretation and analysis of Alaska's World War II-era private coal mining activities".

This assessment was made in a reclamation plan and environmental assessment prepared for the State of Alaska Department of Natural Resources, Division of Mining, as part of the Abandoned Mine Lands (AML) Reclamation Program. Despite the characterization of the Buffalo Mine site as likely eligible for the National Register of Historic Places, the mine area was cleaned up sometime after 1984. The standing and collapsed structures were destroyed, a few pieces of machinery were hauled to the Alpine Historical Society in Sutton, the mine portals were sealed, the remaining debris was removed, and some revegetation work begun. Only the large boilers, which have been stripped of their hazardous asbestos coverings and had their openings welded closed for reasons of public safety, and the gear from the steam lift, are still in place. And in a flood channel of Moose Creek are scattered another upturned boiler, timbers, and scrap metal from deteriorated structures.

Although the Buffalo Mine was cleaned up as part of AML, the site was deemed eligible for the National Register of Historic Places in 1986 (Alaska Department of Natural Resources 1986), apparently based on the report of Mishler. However, little of historic value remains at the site today and the loss of culture values as a result of the clean-up seemingly would render the issue of eligibility moot.

Still, further effort has been expended by the National Park Service under the Historic American Engineering Record (HAER) for the Buffalo Mine, supposedly during conveyance of Federal land from the Alaska Railroad to the State of Alaska. This study noted the work of the AML program. Photos of the removed equipment, now on display in Sutton, were made. Plan drawings of the mine facilities were made after AML clean-up (Houston n.d.). While the AML and HAER activities seem a process that might have benefited from a reordering of tasks, suffice it to say that

considerable effort and expenditure has been directed toward assessing a completely altered historic site.

6.0 CONCLUSION

A cultural resource survey of the proposed Wishbone Hill coal project area conducted by personnel of the Northern Anthropology Consortium did not identify any previously unknown prehistoric or historic cultural resource sites despite examination of areas deemed to possess moderate and high archeological potential. The three known historic sites within or adjacent to the project area no longer appear to possess data significant to our understanding of the past. Therefore, it is the opinion of the principal investigators that coal mining can proceed in the project area without adverse impact to cultural resource sites. Those known sites that exist immediately adjacent to the project area have been altered to a condition that does not warrant significance consideration. No previously unknown cultural resource sites were discovered.

7.0 ACKNOWLEDGMENTS

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8.0 REFERENCES

Alaska Department of Natural Resources.

1986 Matanuska Valley moose range management plan. Alaska Department of Natural Resources and Alaska Department of Fish and Game.

Atwood, W.

1909 Mineral resources of southwestern Alaska. U.S. Geological Survey Bulletin (379).

Bacon, G.

1974 Malemute drop zone: Preliminary archeological survey report. Anchorage: Alaska Department of Natural Resources, Division of Parks, Office of History and Archeology.

1978 The Denali Complex as seen from Long Lake, southcentral Alaska. Paper presented at the Fifth Alaska Anthropological Association Meeting, Anchorage, Alaska.

- Bacon, G. (ed.)
 1982 Cultural resource assessment: Beluga study area, southcentral Alaska. In Susitna River Basin Study, U.S. Department of Agriculture in cooperation with the State of Alaska.
- Bancroft, H.
 1886 History of Alaska 1730-1885. Darien, Connecticut: Hafner Publishing Company.
- Bauer, M., and V. Cole
 1985 A history of coal mining in the Sutton-Chickaloon area prior to WWII. Alaska Historical Commission Studies in History (180).
- Birket-Smith, K.
 1953 The Chugach Eskimo. Nationalmuseets Skrifter, Copenhagen.
- Boraas, A.
 1975 Archeological survey report, proposed Tesoro pipeline, Kenai Peninsula, Alaska. Anchorage: Alaska Department of Natural Resources, Division of Parks, Office of History and Archeology.
 1976 Report on the 1975 excavations of the Kalifornsky Village site, Kenai Peninsula, Alaska. Anchorage: Alaska Department Of Natural Resources, Division of Parks, Office of History and Archeology.
- Clark, D.
 1968 Koniag Prehistory. Ph.D. dissertation, University of Wisconsin, Madison. Ann Arbor: University Microfilms.
 1971 The Tanaina Indians as seen from the Pacific Eskimo Belt. Paper presented at the Athapaskan Conference, National Museums of Canada, Ottawa.
- Clark, G.
 1977 Archeology of the Alaska Peninsula: The coast of Shelikof Strait, 1963-1965. University of Oregon Anthropological Papers (13).
- Cook Inlet Native Association
 1975 Cook Inlet inventory of historic sites and cemeteries. Cook Inlet Native Association, Anchorage.
- Cook, J., and J. King
 1785 A Voyage to the Pacific Ocean, Undertaken by the Command of His Majesty, for Making Discoveries in the Northern Hemisphere. 2nd edition, London.

- de Laguna, F.
1934 The archeology of Cook Inlet, Alaska. Philadelphia: University of Pennsylvania Press.
1956 Chugach prehistory: The Archeology of Prince William Sound, Alaska. Seattle: University of Washington Press.
1975 The archeology of Cook Inlet, Alaska. The Alaska Historical Society, 2nd edition.
- Dixon, G., and W. Johnson
1973 Survey of the prehistoric and historic values of 48 waysides of the Alaska, State Park System. Anchorage: Alaska Department of Natural Resources, Division of Parks, Office of History and Archeology.
- Dixon, J., G. Smith, R. Betts and R. Thorson
1982 Final report, Sub-Task 7.06: Cultural resources investigation for the Susitna hydroelectric project. Fairbanks: University of Alaska Museum.
- Dumond, D.
1971 A summary of archeology in the Katmai Region, southwestern Alaska. University of Oregon Anthropological Papers (2).
1977 The Eskimos and Aleuts. London: Thames and Hudson, Ltd.
- Dumond, D., and R. Mace
1968 An archeological survey along Knik Arm. Anthropological Papers of the University of Alaska 14(1):1-21.
- Fall, James
1987 Upper Inlet Dena'ina regional bands, subsistence patterns, and traditional leaders. In Shem Pete's Alaska, edited by James Kari and James Fall. Alaska Native Language Center (University of Alaska) and The CIRI Foundation, pp. 21-28.
- Federova, S.
1973 The Russian population in Alaska and California, late 18th Century-1867. Kingston, Ontario: Limestone Press.
- Gibson, D.
1980 Cultural resources survey along the Palmer-Wasilla highway. In Archeological Survey Projects, 1978. Miscellaneous Publications, History and Archeology Series (22). Anchorage: Alaska Department of Natural Resources, Division of Parks, Office of History and Archeology.

- Giddings, J. L.
1964 The archeology of Cape Denbigh. Providence: Brown University Press.
- Glenn, Edward and William Abercrombie
1899 Reports of explorations in the Territory of Alaska. U.S. Adjutant General's Office, Military Information Division, Publication 25. War Department Document 102. Washington: U.S. Government Printing Office.
- Heizer, R.
1956 Archeology of the Uyak Site. University of California Anthropological Records 17(1).
- Heusser, C.
1960 Late Pleistocene environments of North Pacific North America. American Geographical Society, Special Publications (35).
- Holmes, C.
1979 Report of archeological reconnaissance: Fort Richardson Withdrawal Area, Fort Richardson, Alaska. U.S. Army Corps of Engineers, Alaska District.

1981 Archeological evaluation of the proposed Chakachamna Hydroelectric Project. Anchorage: Woodward Clyde Consultants.
- Hopkins, D., J. Matthews, Jr., C. Schweger and S. Young
1982 Paleoecology of Beringia. New York: Academic Press, Inc.
- Houston, B.
n.d. Historic American Engineering Record: Buffalo Coal Mine. HAER No. AK-22.
- Kari, James
1977 Linguistic diffusion between Ahtna and Tanaina. International Journal of American Linguistics 43: 274-289.
- Kari, James and James Fall (eds.)
1987 Shem Pete's Alaska. Alaska Native Language Center (University of Alaska) and The CIRI Foundation.
- Kari, J., and P. Russell Kari
1982 Dena'ina Elnena, Tanaina country. Alaska Native Language Center, University of Alaska.

Kent, F., J. Matthews and F. Hadleigh-West

- 1964 An archeological survey of portions of the northwestern Kenai Peninsula. Anthropological Papers of the University of Alaska 12(2):101-134.

Lobdell, J.

- 1981 Cultural resources: Ship Creek dam study. Ott Water Engineers, Inc.
- 1983a An archeological assessment of the Eklutna Water Project, Upper Cook Inlet, Alaska. Eklutna Water Project.
- 1983b Beluga to Anchorage Natural Gas Pipeline. Archeological and historical resources report. Anchorage: Northern Technical Services.
- 1983c Diamond Chuitna Project: archeological and historical resources baseline. Anchorage: Environmental Research and Technology, Inc., Fort Collins, Colorado, and Diamond Shamrock Chuitna Coal Joint Venture.
- 1984 An archeological assessment of the Eklutna Water Project, Phase 11: Staging areas, material sources, and route alterations, Upper Cook Inlet Alaska. Anchorage: Eklutna Water Project.
- 1986 Diamond Chuitna project: Archeological and historical resources continued study. Diamond Shamrock Chuitna Coal Joint Venture, Anchorage.
- 1987 Diamond Chuitna project: Archeological and historical resources continued study. Diamond Alaska Coal Company.

Moffit, F.

- 1906 Gold fields of the Turnagain Arm region. United States Geological Survey Bulletin (277).

Osgood, C.

- 1966 The ethnography of the Tanaina. Yale University Publications in Anthropology (16) New Haven: Reprinted by Human Relations Area Files press.

Porter, R.

- 1893 Report on the population and resources of Alaska, 1890, 11th Census, Part 7. U.S. Government Printing Office.

Potter, L.

- 1967 Old times on Upper Cook Inlet. Anchorage: Book Cache.

- Rabich, J.
1976 The archeological significance of Point Woronzoff. Anchorage: Cook Inlet Region, Inc.
- Reger, D.
1973 An Eskimo site near Kenai, Alaska. Masters thesis, Washington State University, Pullman, Washington.
1974 Prehistory of the northern Kenai Peninsula. In *The Native, Russian and American Experiences of the Kenai Area of Alaska*, edited by J. Hornaday. Kenai.
1977 Prehistory in the upper Cook Inlet, Alaska. In *Prehistory of the North American Sub-arctic, the Athapaskan Question*. Proceedings of the Ninth Annual Conference, The Archeological Association of the University of Calgary. Calgary, Alberta.
1980 Report of archeology field survey in the Willow-Wasilla area. In *Archeological Survey Project, 1978, Miscellaneous Publications, History and Archeology Series (22)*. Anchorage: Alaska Department of Natural Resources, Division of Parks, Office of History and Archeology.
1981 A model for culture history in upper Cook Inlet, Alaska. Ph.D. Dissertation, Washington State University, Pullman, Washington.
- Reger, D., and J. Antonson
1976 Potter-Girdwood archeological and historic site survey. Anchorage: Alaska Department of Natural Resources, Division of Parks, Office of History and Archeology.
- Reger, D., and W. Hannibal
1975 Archeological survey along the proposed Tesoro gas pipeline route, Point Campbell to the Tesoro terminal portion. Anchorage: Alaska Department of Natural Resources, Division of Parks, Office of History and Archeology.
- Ross, R.
1971 The cultural sequence at Chagvan Bay, Alaska: A matrix analysis. Ph.D. Dissertation, Washington State University, Pullman, Washington.
- Stanley, V.
1980 Paleoecology of the Arctic steppe mammoth biome. *Current Anthropology* 21(5):663-666.

- Steele, J.
1980 Archeological survey and cultural resources overview: Fort Richardson, Alaska. U.S. Army Corps of Engineers, Alaska District.
- Tikhmenev, P.
1978 A history of the Russian American Company, edited by R. Pierce and A. Donnelly. Seattle: University of Washington Press.
- Townsend, J. B.
1970 The archeology of Pedro Bay, Alaska. Paper presented at the 35th Annual Meeting, Society for American Archeology, Mexico City.
- U.S. Department of Agriculture
1983 Susitna River basin study. U.S. Department of Agriculture in cooperation with the State of Alaska.
- U.S. Environmental Protection Agency
1982 Environmental impact statement: City of Anchorage, Alaska, wastewater facilities. Seattle: U.S. Environmental Protection Agency.
- Vancouver, G.
1798 A Voyage of Discovery to the North Pacific Ocean and Around the World ...in the years 1790, 1791, 1792, 1793, 1794, and 1795 in the Discovery Sloop of War and Armed Tender Chatham by Captain George Vancouver. London: G. and J. Robinson.
- VanStone, J.
1974 Athapaskan Adaptations. Chicago: Aldine Publishing Company.
- Veltre, D.
1978 Report to the Chugach Electric Association: Archeological survey of right-of-way from University Substation to Knik Arm (East Terminal). Anchorage: Chugach Electric Association.
- Warfield, R.
1962 Bituminous coal deposits of the Matanuska Coal Field, Alaska: Central and western parts, Wishbone District. U.S. Department of the Interior, Bureau of Mines, Report of Investigations (5950).

- West, F. H.
1975 The alignment of late Paleolithic chronologies in Beringia. Paper presented at the All-Union Symposium "Correlation of Ancient Cultures of Siberia and Adjoining Territories of the Pacific Coast." Novosibirsk, U.S.S.R.
- Woodman, L., (ed.)
1984 Lieutenant Castner's Alaskan exploration, 1898: A journey of hardship and suffering. Alaska Historical Commission Studies in History (125).
- Workman, K.
1978 Survey report: East terminal site on Elmendorf Air Force Base. Anchorage: Chugach Electric Association.
- Workman, W.
1977 Ahtna archeology: A preliminary statement. In Prehistory of the North American Sub-Arctic, The Athapaskan Question. Proceedings of the Ninth Annual Conference, The Archeological Association of the University of Calgary. Calgary, Alberta.
- Workman, W., J. Lobdell and K. Workman
1980 Recent archeological work in Kachemak Bay, Gulf of Alaska. Arctic 33(3):385-389.
- Yarborough, L.
1979 Report of archeological survey on the Goose Bay-Point Mackenzie LSR&T project, phase 1. Matanuska-Susitna Borough.

1980 Report of archeological survey on the Goose Bay-Point Mackenzie LSR&T project, phase 11. Matanuska-Susitna Borough.

1981 Preconstruction archeological survey for proposed well field, Ship Creek hatchery. Alaska Department of Fish and Game.
- Yarborough, L., and M. Yarborough
1981 Archeological survey of proposed West Long Lake drive. Matanuska-Susitna Borough.

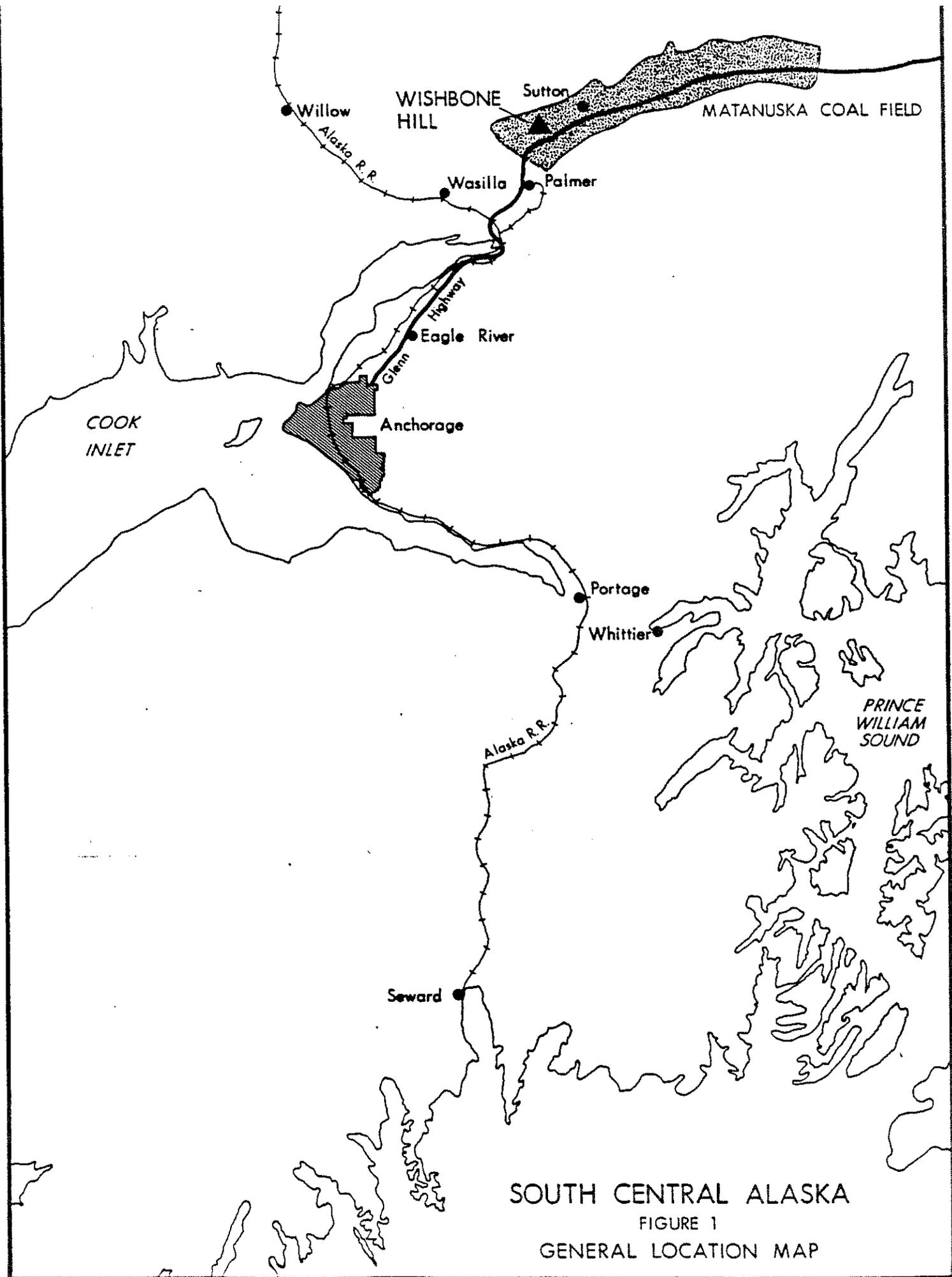
9.0 RESPONSIBLE PARTIES

Cultural resources site survey and baseline report preparation were conducted by the Northern Anthropology Consortium consisting of:

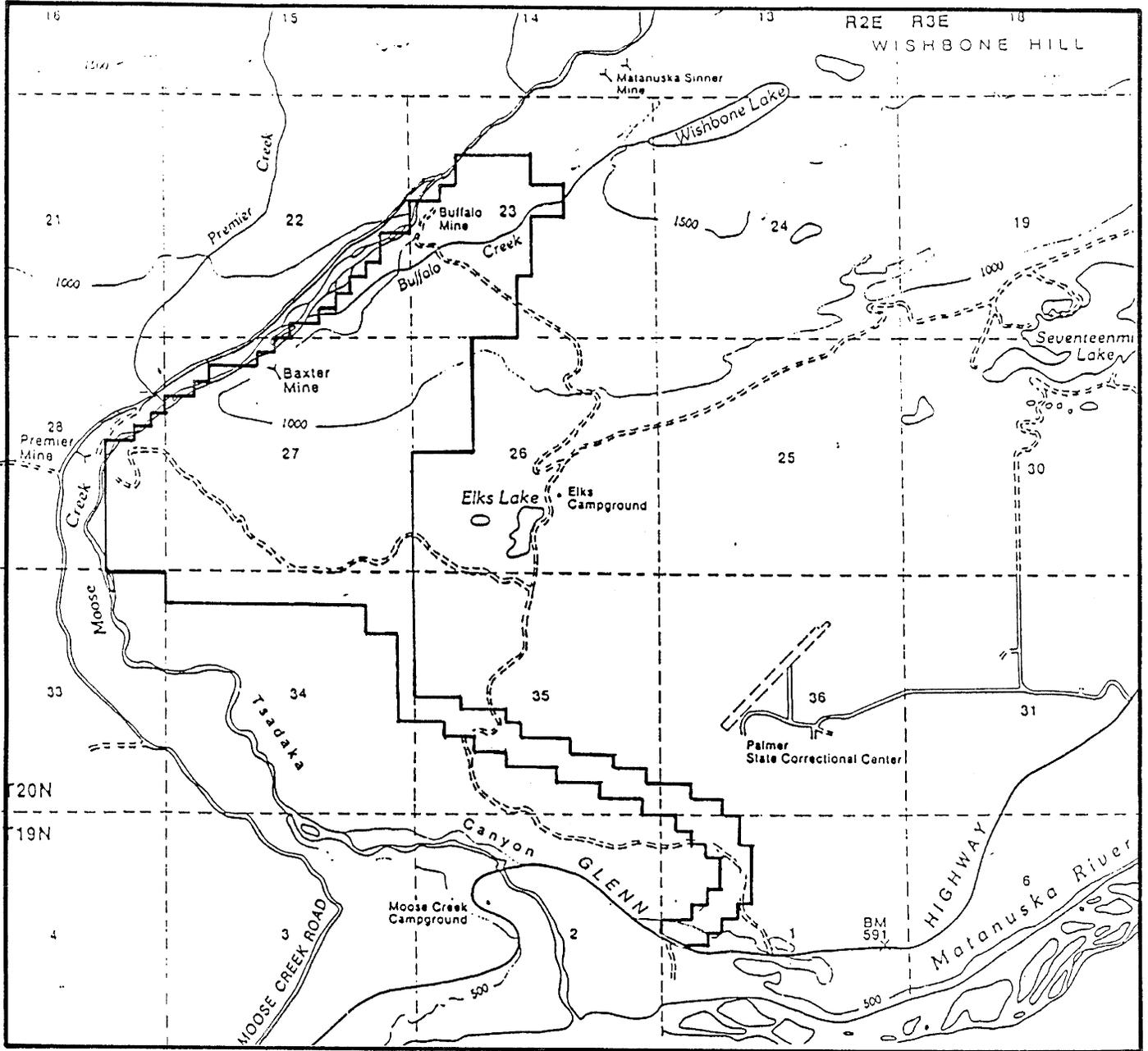
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FIGURES



SOUTH CENTRAL ALASKA
FIGURE 1
GENERAL LOCATION MAP



DESIGN BY:
 DRAWN BY:
 CHECK BY:
 DWG FILE:
 DATE DRAWN:

PROJECT AREA

USIBELLI COAL MINE, INC.
 P.O. BOX 1000, HEALY, ALASKA 99743 (907) 683-2226

WISHBONE HILL MINE  PERMIT No. 01-89-796
 FIGURE No. 2 REV. 0
 SCALE: