APPENDIX 8:

HOPE LAKE
REMEDIATION PROJECT

ARCHAEOLOGICAL IMPACT ASSESSMENT

FINAL REPORT

ARCHAEOLOGICAL IMPACT ASSESSMENT (AIA) OF THE HOPE LAKE MINING EXPLORATION CAMPS, DISMAL LAKES, NUNAVUT

Submitted to:

The Department of Culture, Language, Elders and Youth (CLEY), Nunavut
Nunavut Permit No. 2010-019A

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November 2010 **10-1333-0026**

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EXECUTIVE SUMMARY

During July of 2010, Golder Associates Ltd. (Golder) conducted an Archaeological Impact Assessment (AIA) of the Hope Lake Mining Exploration Camps, Dismal Lakes, Nunavut on behalf of EBA Engineering Consultants Ltd. (EBA) working for Public Works and Government Services Canada (PWGSC) and Indian and Northern Affairs Canada (INAC). This AIA was carried out in conjunction with the Phase III Environmental Site Assessment, Hazardous and Non-Hazardous Materials Audit, Geotechnical Evaluation and Remedial Action Plan and Environmental Assessment. All required fieldwork was completed under an Archaeological Permit (2010-019A) issued by the Department of Culture, Language, Elders and Youth (CLEY), Nunavut to Brent Murphy of Golder.

The Hope Lake Mining Exploration Camps include five separate sites, Hope Lake, Husky Creek North, Husky Creek South, Willow Creek South Cabins and Willow Creek Southwest Cabins located between 55 and 75 km southwest of Kugluktuk. Low-level aerial reconnaissance of the site areas was conducted in order to assess the locations of all structures and debris requiring further investigation and to identify areas of archaeological potential. As requested, areas which will not be impacted during remediation were not examined. During the study three archaeological sites were identified and documented as per the *Nunavut Archaeological and Palaeontological Sites Regulations* (CLEY 2003).

PWGSC has fulfilled the requirements to indentify the potential for impact to heritage resources during the proposed remediation/reclamation of the Hope Lake Mining Exploration Camps. The AIA included the participation of Wynn Algona and Kenny Kuodluak from the local community of Kugluktuk, who acted as bear monitors and participated in the identification and recordation of the heritage resource sites.

During the investigations three heritage resource sites, MiPn 1, MiPn 2 and MiPn 3, were newly recorded. MiPn 1 is a stone feature site that includes four food caches in a boulder field along the southwest shore of Hope Lake, and MiPn 2 and MiPn 3 are both comprised of a single inukshuk features on a landform overlooking the Hope Lake

Mining Exploration Camps. It is recommended that all three sites be avoided during the remediation of the Hope Lake Mining Exploration Camps.

It is recommended that PWGSC have met their obligations to assess the potential for impact to heritage resources during the proposed Remedial Action Plan. It is also recommended that the newly identified sites, MiPn 1, MiPn 2 and MiPn 3 be avoided during reclamation activities.

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1. INTRODUCTION

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INSET MAP NOT TO SCALE

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LEGEND

PROJECT AREA

PROJECT LOCATIONS

REFERENCE

TOPOGRAPHIC MAP 86N OBTAINED FROM Canmatrix.® 1990 HER MAJESTY THE QUEEN IN RIGHT OF CANADA, DEPARTMENT OF NATURAL RESOURCES ; TRANSVERSE MERCATOR DATUM ; NAD27 COORDINATE SYSTEM ; UTM ZONE 11W.

PROJECT

HOPE LAKE MINING EXPLORATION

TITLE

PROJECT LOCATION

Golder Associates
Calgary, Alberta

PROJECT	10.1333.0026.8470			FILE No.	10133300268470A001
DESIGN	BM	19/10/10		SCALE	AS SHOWN
CADD	KJM	19/10/10		REV.	0
CHECK	BM	19/10/10			
REVIEW	DB	19/10/10			

FIGURE: 1

2. LOCATION AND SITE DESCRIPTION, POTENTIAL IMPACTS, AND OBJECTIVES

2.1 Location and Site Description

The Hope Lake Mining Exploration Camps remediation project consists of five separate sites, Hope Lake, Husky Creek North, Husky Creek South, Willow Creek South Cabins and Willow Creek Southwest Cabins. Hope Lake camp is located 75 km southwest of Kugluktuk (Figure 1) and 20 km northeast of the Dismal Lakes. The site is partially situated on the south shore of Hope Lake and it is the largest of the five sites examined (1,500 hectares) during the present study. The Hope Lake site consists of three separate exploration camps, CRL Camp, Hearne Camp and New Camp, (Plates 1 through 3), metal debris area, several fuel barrel caches, an airstrip, roads and several bulk fuel storage tanks (Plate 4). The camps are the product of exploration activities that were carried out by Coppermine River Limited (CRL) and Hearne Coppermine Limited (Hearne) who in the late 1960's had produced a detailed plan for a mine and associated infrastructure. However, no mining activities other than exploratory drilling and survey were ever carried out and the site was abandoned by the mid to late 1970's. Although there is no known date, the New Camp is much more recent.

Husky Creek consists of two small locations on the south and north sides of a small unnamed lake (Figure 1) about 55 km southwest of Kugluktuk. The south site consists of several debris areas that contain the remains of a floor platform, wood debris, propane cylinder, metal debris, drill core boxes and an old water pump, drill (Plate 5) and nine fuel barrels (Plate 6). The site footprint is approximately 800 m^2. There is no historical information available on the Husky Creek south site.

The Husky north site currently consists of an abandoned Bombardier Muskeg vehicle (Plate 7), wood and metal debris and three fuel drums (Plate 8). The site area is approximately 9,500 m^2. The site was operated by Newmont Exploration of Canada

Plate 1 **Aerial photo of the remains of the CRL Camp showing structure remains, barrels and bulk fuel storage tanks.**

Plate 2 **View east of the remains of the Hearne Camp with core boxes in the foreground, structure remains and bulk fuel 'sausage tanks' can be seen in the distance.**

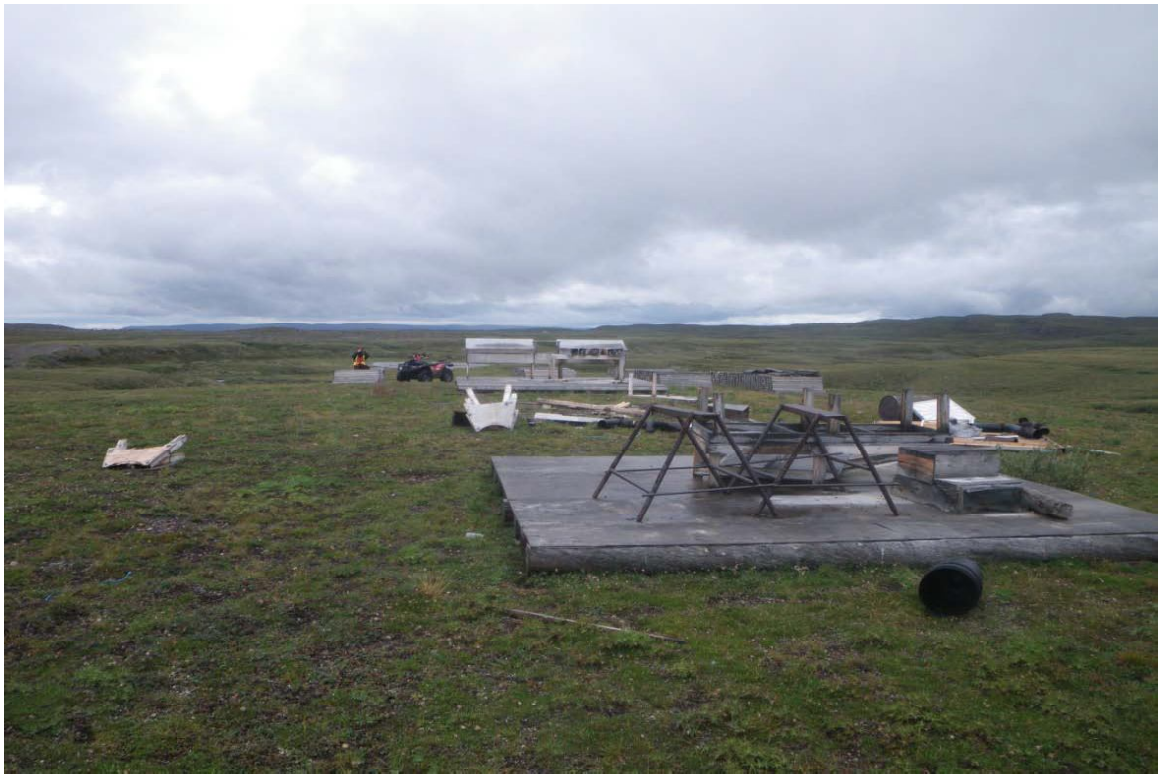


Plate 3 View northeast of the New Camp showing the remains of the floors of the shop tent and office tent with core boxes in the background.

Plate 4 View north of bulk fuel storage or Petroleum Oil Lubricant (POL) Tanks.

Limited in the early 1980's as a mineral exploration camp and used the location that had been used by a previous unknown occupant that had left behind the Bombardier snow machine.

The Willow Creek site consists of the main site, south cabins and southwest cabins (Figure 1). The main site consists of seven drum caches, four collapsed structures, one intact structure, five debris areas as well as scattered wood and metal debris (Plates 9 and 10). The Willow Creek main site is spread out over an area of approximately 16 hectares. The historical occupant of the Willow Creek main site is unknown, however a mineral exploration report on work conducted by Huntec Ltd. for the September Mtns. Copper Mines Ltd. in the late 1960's indicates that Willow Lake was used to land float planes for access to claims located to the south and southwest.

Plate 5 View northwest of water pump and drill at the Husky Creek South site.

Plate 6 Aerial view north of Husky Creek South Site.

Plate 7 View southwest of the Bombardier Muskeg Vehicle and assorted debris.

Plate 8 Aerial view northeast of Husky Creek North Site.

Plate 9 Aerial photo south of the Willow Lake Main site.

Plate 10 View southwest of building remains with cores boxes.

The Willow Creek South Cabins consists of two debris areas, one collapsed structure, one dilapidated structure and two drum caches (Plates 11 and 12). The site footprint is approximately 0.45 hectares. The historical occupant of the South Cabins is unknown; however, a geophysical report prepared for Eskimo Copper Ltd. (optioned by Bernack Coppermine Exploration Ltd.) indicated that a base camp was located in the area corresponding to the location of the site in the late 1960's.

The Willow Creek Southwest Cabin consists of one debris area, one collapsed structure, one drum cache and a float plane dock (Plates 13 and 14). The site footprint is approximately 0.6 hectares and the occupant of the Southwest Cabin is unknown. It is assumed that the Southwest Cabin site was a base camp for mineral exploration.

Plate 11 Aerial photo southwest of the Willow Lake South cabin.

Plate 12 View northwest of dilapidated structure, Willow Lake South site.

Plate 13 Aerial photo north of the Willow Lake Southwest cabins.

Plate 14 View north of core boxes, floor and fuel barrels, Willow Lake Southwest.

All three of the Willow Creek sites are connected by trails and the Willow Creek main site is in turn connected to the Hope Lake site (Figure 1; Plate 15). Therefore it is assumed that the Willow Lake sites are related and roughly contemporary with the Hope Lake site.

Plate 15 Aerial photo northwest along trail between Willow Lake and Hope Lake along unnamed lake.

2.2 Potential Impacts

The potential impacts to heritage resources around the Hope Lake Mining Exploration Camps are dependent upon the proximity of those resources to the remediation activities that will be conducted to remove the remnants of the former camps and related infrastructure. Heritage resource sites are non-renewable resources that may be located at or near ground level or may be deeply buried. Prehistoric or precontact archaeological sites are those sites which contain features, artifacts or ecofacts reflecting the use of a given land base by people prior to European influences and technologies. Features are

non-portable articles that indicate a human modification of the local environment such as hearths, pits, tent rings, stone cairns and Inuksuit. Artifacts are portable items that have been modified by people at some time in the past. These include such items as projectile points, stone flaking debris, and cut and modified bone. Ecofacts are naturally occurring items such as preserved plant remains or pollen that can aid in the interpretation of archaeological sites. Historic archaeological sites include the features, artifacts and ecofacts relating to the past few hundred years of human occupation. These sites are typically identified by the presence of buildings or structural remains, but may include any site that has evidence of historic use of the landscape.

Alteration of the landscape can result in the damage or complete destruction of all or portions of historic resource sites. These alterations often involve the displacement of artifacts resulting in the loss of valuable contextual information or may involve the destruction of the artifacts and features themselves resulting in complete information loss. These losses are permanent and irreversible. Primary, secondary and tertiary impacts are possible with any new development. Remediation can be considered a new development in this context if it impacts previously undisturbed areas during operation.

Primary impacts include those disturbances resulting immediately from a project. The primary impact zone is the area within the remediation footprint including access roads, temporary work zones, borrow pits and dumps. Individual sites are likely to be affected to varying degrees if they are located within the development area. Artifact context is fundamental to interpretation of archaeological sites. By disturbing the context in which artifacts and features are recovered, interpretations of heritage resources sites and, ultimately, past lifeways are affected negatively.

Secondary impacts can occur when the support services or additional access required by development adversely affects heritage resources outside the primary target areas. The remediation project should have no secondary effect on heritage resources.

Tertiary impacts are the results of project induced changes in demography and land use patterns. Increased rates of intentional and unintentional impacts can be expected as a result of increased visitation to an area if the project were large enough to affect regional population bases. Tertiary impacts are anticipated to be very low for this project, especially because changes to the site through remediation will probably not affect the visitation rates.

The study detailed in this report is intended to identify areas of possible impact and to determine whether the current proposed project will disturb those heritage resources located in proximity to the development.

2.3 Project Objectives

The objective of the 2010 study at the Hope Lake Mining Exploration Camps is to ensure that heritage resources are not inadvertently impacted by the proposed clean-up and remediation project. The purpose of this AIA is to:

- conduct a pre-impact assessment of the proposed remediation areas;
- identify any archaeological sites within those areas (if present);
- make recommendations to CLEY and PWGSC to mitigate or avoid those sites;
- make recommendations on surveillance and monitoring;
- provide a cost estimate on implementing the recommendations during the construction phase; and
- prepare a draft Final Report to be reviewed by PWGSC, followed by a Final Report for distribution as required and submission to CLEY.

3. PHYSICAL AND CULTURAL SETTING

3.1 Environmental Context

An understanding of past environmental conditions and the environmental factors that shape human approaches to subsistence and settlement patterns enable archaeologists to not only locate sites, but also to provide more accurate interpretations of individual sites. The physical aspects of the environs (topography, drainage, climate and soils) as well as resource availability (flora, fauna, lithic materials and water) are prime criteria for the identification of site location and function. Assessments of the universal cultural activities of site location, travel within and through the area, and resource exploitation are key components of any archaeological site analysis.

The anthropological theory of environmental determinism suggests that, to a great extent, environmental factors condition human behavioural and cultural adaptations, or patterns of behaviour. The environment has likely influenced many of the activities that contribute to the character of the regional prehistoric record. All available environmental variables must be considered as indicators of prehistoric use of the landscape.

The regional environment influences where specific activities and occupation are located in a pattern of seasonal movements according to the availability of resources: a seasonal round. The variables of archaeological site distribution can be identified and combined into useful criteria for suggesting the potential of an environment to hold heritage resources that includes a wide variety of landforms frequently associated with coastlines and lake shores, river banks, eskers and kames, and bedrock knolls in Arctic environs. Distribution patterns partially reflect environmental opportunities presented to human groups as well as cultural preferences demonstrated by site location. Topography influences much human activity including travel, communication, resource catchments, dwelling locations and eventually constrains human activity areas to defined localities. Based on existing heritage resources, the environment is a key factor in human settlement patterns.

3.2 Regional Environment

Prior to contact with Europeans, the environment in which the people of North America lived strongly influenced their culture and economy. The people who inhabited the North took advantage of the seasons and all the resources that were available.

The study area lies in the Southern Arctic ecozone (Natural Resources Canada 2010). This ecozone is bounded to the south by the treeline, a broad ecological division between the taiga forest and the treeless arctic tundra. The terrain is undulating with many lakes and ponds that have been formed by the melting glaciers of the last glaciation. Permafrost covers the whole ecozone. Short cool summers and long cold winters characterize the study area with total annual precipitation of less than 250 millimetres. The vegetation is typical of a tundra environment and consists of arctic willows, marshy lowlands and lichen on rocky outcrops. The project area is within the territory of muskoxen, barren ground caribou, moose, grey wolves, artic foxes, red foxes, barren ground grizzly bears, wolverines, ermine, least weasels, mink, artic hare, brown lemmings, northern red backed voles and ground squirrels.

The study area is generally flat with some gently rolling areas (Figure 1). All of the mining exploration camps are situated on lakes. During the study the only wildlife that was observed were three grizzly bears (sow and two cubs) and a heard of caribou (approximately 1,000).

3.3 Heritage Resources

Archaeology is the study of human history through the material remains of culture, now known as heritage resources. The ultimate goal in archaeology is to describe the cultures and events responsible for the creation and deposition of the remains at a given archaeological site. As such, archaeologists use material remains to determine the nature and age of cultural occupations at a site. Artifacts, ecofacts and features deposited into the natural environment, along with their inter-relationships, are the integral parts that

make up an archaeological site. The *Nunavut Archaeological and Palaeontological Sites Regulations* (2003) define heritage resources as: "but not limited to, archaeological and historical sites, burial grounds, palaeontological sites, historical buildings and cairns."

Predating the arrival of Europeans, precontact archaeological sites are comprised of artifacts, features and residues of native origin typically characterized by modified bone and stone, and stone structures. Historic sites are those structures, features, and objects of European influence that date back to contact with the Europeans but can also represent more recent activity of more than 50 years. Depending on the context, sites less than 50 years old may be considered to represent traditional land use and are identified to document continued use and occupation of an area to the present time. A key component of the historic period record are the sites, artifacts and affiliated resources relating to post-contact Aboriginal people's use of the landscape. These include both archaeological sites and objects such as standing and collapsed cabins, campsites, graves, and traditional sites and resources, such as special places, hunting and plant collecting areas, traplines and their associated remains, oral traditions and various documents. These latter resources are usually identified through consultation procedures such as Traditional Use Studies (TUS) or community consultations.

Additionally, heritage resources include, as well as the sites where events took place in the past, all of the objects that they contain and any of the contextual information that may be associated with them and will aid in their interpretation, including natural specimens and documents or verbal accounts.

Heritage resources are non-renewable and are susceptible to alteration, damage, and destruction by construction and development activities. The value of heritage resources cannot be measured in terms of individual artifacts or biological specimens, rather the value of these resources lies in the integrated information which is derived from the relationship of the individual artifacts and fossil specimens, associated features, spatial relationships (distribution), and contextual situations. Interpretation of heritage resource materials, and the ability to interpret the significance of particular sites in a landscape, is

based on an understanding of the nature of the relationship between individual archaeological and palaeontological materials as well as the sediments and strata within which they are contained. As such, removal or mixing of cultural or fossil bearing sediments results in the permanent loss of information basic to the understanding of these resources. As a result, heritage resources are increasingly susceptible to destruction and depletion through disturbance.

Similarly, tundra areas north of the tree line are characterized by extremely slow rates of soil development and sediment accumulation. Accordingly, at repeatedly occupied sites, there is little chance of distinguishing occupations relating to different periods within the 10,000-year record of human occupation in the region without recovering a diagnostic indicator. Some areas of high sediment deposition rates are present within the study area, but these are not the typical scenario.

The lack of temporally diagnostic artifacts, the absence of materials suitable for radiocarbon dating, and the natural mixing of shallow archaeological deposits serve to limit the definition of the recognized prehistory for the region. In contrast, extant documents, records, and oral testimony provide a firmer basis for understanding the historic period of the region.

3.3.1 Cultural Chronology

Many of the archaeological materials in the project area represent human activity after the ice sheet receded about 8,000 years ago. Most heritage resources sites have been located on eskers in this regional environment (Noble 1981: 97) and Wright (1995: 121) refers to this early period, 8,000 to 4,000 B.C., as the Early Shield culture and suggests a direct development out of eastern and northern predecessors based on technological characteristics and trends.

Between approximately 6,000 and 3,000 BP lanceolate projectile points are seen as horizon markers. The Shield Archaic is replaced by the Arctic Small Tool tradition (ASTt) components, attributable to *Palaeo-Eskimo* peoples.

3.3.1.1 Arctic Small Tool tradition (4200 BP to 2800 BP)

There is presently little evidence to link Palaeo-Arctic tradition occupations to the Arctic Small Tool tradition (ASTt) occupations that succeed them. The ASTt represents a widespread cultural manifestation that covers all of the Canadian Arctic as well as parts of Alaska and Greenland. The ASTt is typically thought to date between approximately 4,200 and 2,800 B.P. (McGhee 1990). It includes the Denbigh Flint complex in northern Alaska, the Independence I culture of the Canadian High Arctic, the Inuvik Phase and the Pre-Dorset culture in Arctic Canada, and the Sarqaq culture in Greenland. It is thought that the ASTt relates to a separate migration of peoples from Siberia and does not appear to be related to the preceding Palaeo-Arctic tradition. As the name implies, the toolkit of the ASTt is comprised of lithic artifacts that are finely made and smaller than tools of similar function and age from elsewhere in North America. These include microblades and microcores, burins, gravers, small side and end scrapers, side and end blades, and bipointed (arrow) and triangular (harpoon) projectile points (Wright 1995). In Alaska it appears to have developed into the cultures of the Norton tradition while in Canada it developed into the Dorset culture.

The Canadian Tundra Tradition (3,300 – 2,600 BP) has been described as a local variant of the ASTt which focused on caribou exploitation (Noble 1981). Sites of this cultural tradition are widespread, being represented in sites on Great Slave and Great Bear Lakes eastward to North Henik Lake near Hudson Bay. Characterized by large lenticular and oval bifaces, small triangular and side notched points, side blades, burin and microblade technology, these assemblages are most commonly associated with orange/pink and white quartzites. Native copper appears in some sites toward the end of this period.

Following the ASTt is the Taltheilei Shale Tradition (2,500 BP to 100 BP), seen as ancestral to development of the Athapaskan people (Noble 1981). Artifacts of siliceous shale originating on the eastern arm of Great Slave Lake are characteristic; although Taltheilei artifacts have also been identified in the Barrens south of Kugluktuk at Itchen Lake (Blower 2003). Lanceolate projectile points continue to be important in the tool assemblage but small corner and side notched points occur in the latter half of the tradition. The prominent biface and burin and microblade technologies of the preceding phase are notably absent.

3.3.1.2 Dorset Culture (2,500 BP to 1,000 BP)

The Dorset culture occupied the Canadian Arctic from 2,500 BP until at least 1,000 BP. (McGhee 1990). Best known for miniature carvings, Dorset appears to have been a more successful adaptation to the conditions of the north than the preceding ASTt cultures from which it developed. This is demonstrated by the huge area occupied by Dorset groups and by evidence that they had perfected winter hunting on the sea ice. Cooler conditions in the northern hemisphere around 3,000 years ago resulted in expansion of the sea ice and a shift away from terrestrial hunting of caribou and hunting of sea mammals from boats in open water to a procurement of sea mammals from coastal edges and sea ice. This is evidenced in the archaeological record with a shift away from bow hunting to harpoon and spear hunting (McGhee 1990). Artifacts recovered from sites representing this period are more diverse and "reflect a richer and more secure way of life than that of earlier Palaeo-Eskimos." including the establishment of permanent winter villages (McGhee 1990).

However, when the people of the Thule culture arrived in the Canadian Arctic approximately 1,000 years ago, the Dorset culture had largely or entirely disappeared for reasons that are not well understood (McGhee 2001; Wright 1999).

3.3.1.3 Thule (1,000 BP to 400 BP)

The Thule tradition dates from approximately 1,000 to 400 BP and is derived from the Norton tradition in northern Alaska. More specifically, Thule grows out of the Old Bering Sea and Punuk traditions, which have numerous similarities to Thule cultural assemblages. These assemblages suggest subsistence based on maritime resources such as seals and whales that were hunted from kayaks or umiaks as identified by harpoon floats. Thule represented a new kind of adaptation to the Arctic environment, based on the hunting of large sea mammals in open water through the use of drag floats attached to the harpoon line. Large skin boats and the use of dogs to pull large sleds were other Thule innovations. Winters were spent in sometimes large communities of semi-subterranean houses, subsisting on a stored surplus obtained most typically by hunting bowhead whales. The introduction of Thule into the Canadian Arctic is noted by a distinct change in a number of cultural markers from the Dorset culture. The earliest Thule occupations currently recognized are on islands in the Bering Strait and exhibit an almost complete reliance on maritime resources; however, later sites demonstrate that both maritime and terrestrial resources were utilized (McGhee 1990). Climatic changes following the thirteenth century likely caused the Thule to modify their way of life into that of the various historic Inuit groups.

3.3.2 Historic Inhabitants

Historic use of the project area is identified with the 'Copper Inuit'. The traditional territory of the Copper Inuit extends from the Coppermine River east to the Perry River and the south coast of Banks Island south to Great Bear Lake (Damas 1984). The subsistence, economy and settlement pattern of the Copper Inuit was greatly influenced by seasonal fluctuations. In the spring they would leave their more sedentary villages along the coast to hunt and fish inland. Subsistence from late May until November was reliant on caribou, fish, fowl and small game common on the interior tundra. In the fall during the caribou migration hunting caribou was often the most dominant form of subsistence. The Copper Inuit would return to the coast in the fall to build villages for

the winter; breathing-hole sealing was the most prevalent activity during the winter months. This method involved specialty trained dogs to locate the seals' breathing holes; each hunter would station themselves at a hole and quietly wait for a seal to come up to breathe (Damas 1984). Other resources that were occasionally used include polar bears in the winter and musk-oxen in the summer.

The largest grouping of Copper Inuit was during the winter months when they would gather in villages along the coast (more people was beneficial for breathing-hole sealing). Over the summer they split up into smaller groups and even individual nuclear families when subsistence was based on fishing, hunting small animals and foraging. In the late autumn many of these groups would reunite for the sewing period, when sewing their winter garments was the most important task (Damas 1984).

Although many of the characteristics described are similar with other Inuit groups there are some distinguishing characteristics that the Copper Inuit have. According to Damas (1984) aside form the territory that they inhabited, the Copper Inuit were also known for their wide use of copper; their distinctively tailored clothing; and their social and familial organization.

The Coppermine River is the most important river in the vicinity of the study area. It was visited by the Copper Inuit to obtain native copper, wood, and to hunt summer caribou herds (McGhee 1970:53), and was originally called Kogloktok or Qurlugtug, which means "the place of moving water" (Gray 2005:443). This river runs from the central Canadian Arctic to the Coronation Gulf in Nunavut. The river has been utilized for thousands of years by both Inuit and Dene groups (Gray 2005:443). Indigenous groups would travel to Bloody Falls, located along the Coppermine River, during the autumn to catch migrating arctic char (McGhee 1970:53), however the region also acted as a northern boundary for the southern Athabaskan groups. The falls is also important hydrologically as it is the final major rapid on the river (McGhee 1970:59).

Samuel Hearne (1745-1792) was the first European explorer to enter the Coppermine River area when he traveled by land in 1771 (Gray 2005:443); not to mention the first

European to travel the barren lands, locate Great Slave Lake, and to travel overland to the Arctic coast (Speck 1983; Fuller 1999:270). Hearne was pulled to the area by stories of local copper deposits, and while there "a bloody massacre of a group of Inuit by Hearne's Chipewyan companions on July 17, 1771" occurred (Speck 1983:101; Gray 2005:443). This event gave rise to the name Bloody Falls for a location along the Coppermine River, though the validity of the event has been questioned by some (Fuller 1999:259). Following Hearne, three other notable European explorers surveyed the region: Sir John Franklin, George Back, and John Richardson (Gray 2005:443). Scientific studies have also taken place in the region, beginning with the Canadian Arctic Expedition in 1915 and 1916 (Gray 2005:443). In the second year of this expedition, a trading post was established and later transformed into the village of Kugluktuk at the mouth of the Coppermine river during 1928 (Gray 2005:443). In 1967 the largest stake mining event in Canadian history occurred along the Coppermine River (Geiger and Beattie 1994:168).

3.3.3 Heritage Studies

Prior to the current study of the Hope Lake Mining Exploration Camps, no heritage resources sites were recorded in the Nunavut or Canadian Museum of Civilization database for this location. However, there have been several heritage sites recorded along Dismal Lake, the community of Kugluktuk, Bloody Falls and along the coast of the Coronation Gulf.

Dismal Lake is to the immediate southwest of the survey area. Along the shore of this lake are three archaeological sites previously recorded by E. Harp in 1955: MiPq 1a, MiPq 1b, and MhPo 1. A further nine stone ring sites were also previously identified along the shore of this lake (Harp 1958). The first two sites are located on the northern tip of the lake. MiPq 1a is a prehistoric and historic indigenous campsite. A dozen tent rings were observed on the upper ridge of an esker, along with several associated hearth areas identified by the remains of calcine bone fragments and graying wood chips strewn about the site area; a weathered musk ox skull was also recovered (Harp 1958:221). The wood chips were originally derived from a stand of spruce trees located on a nearby slope

(Harp 1958:223). These rings were likely the product of recent encampments and the remains of a native toboggan were also observed near another cluster of rings that were of a recent occupation. Unrelated to the rings were chipped stone artifacts that were observed and collected (n=40) near the water's edge as these had fallen from the eroding bluff above, where the campsite was located. Chipped stone artifacts were also identified up to 200 yards away from the lake shore, indicating that this is a considerably large site (Harp 1958:221). The nearby MiPq 1b site is classed as a prehistoric lithic scatter that included a projectile point, knives, scrapers, and one unworked microblade (Harp 1958:225). Weathered bone was also observed at the site but was unrelated to the lithic scatter. Six artifacts were collected from the scatter. The third site, MhPo 1, is located on the southern portion of Dismal Lake, approximately 43 km to the south of MiPq 1a and MiPq 1b. This third site is a campsite with perhaps three different occupations, one of which is an ASTt (Arctic Small Tool tradition) occupation. This ASTt occupation is represented by the presence of a microlith industry (Harp 1958:228). This and a second campsite were represented by chipped stone remains, indicating that the second occupation was also prehistoric. The third campsite is associated with recent Inuit artifacts. In total there are six stone tent rings represented at this site and no indication of stratification.

MkPj 8 is a small campsite found when the Department of Resources, Wildlife and Economic Development, Govt. of NWT, Kugluktuk had begun an experimental potato plot within the community of Kugluktuk (Coppermine) –prompting the name of the Potato Garden site. Initially, a bone arrow shaft with attached copper arrowhead, a polar bear incisor pendant and a smoothed flat spatulate bone (skin scraper) were recovered. This prompted Ken Swayze to conduct a field school at the site area in 2002 (2002 Inuit Heritage Trust Archaeological Field Course). The results of this field school indicated the site was a heavily disturbed indigenous historic tent camp site. Two small hearths were also recorded in association with the tent rings. The field school recovered two polar bear tooth pendants or lures, one complete western-style slate ulu, and one cut antler tine with inset iron endblade to add to the initial collection of artifacts. In addition

to these indigenous artifacts, modern glass sherds, metal fragments, and associated roadside detritus were recovered.

The Bloody Falls site (MkPk 3) is one of the better understood previously recorded archaeological sites in this region, located along the Coppermine River 15 km southwest of Kuglutuk. MkPk 3 is situated on a knoll that reveals the occupations of ASTt, Thule, and late prehistoric Copper Inuit (McGhee 1970). In regards to the ASTt, the assemblage indicates a "single seasonal occupation by a small camp unit, perhaps a single family" (McGhee 1970:58). Associated wood charcoal remains yielded a date of 3,300 $\pm$90 (S-462) years B.P. The stone tool assemblage recovered from MkPk 3 is distinctly different from MhPo 1 (McGhee 1970:58). This distinction may represent a difference of age between the sites. Archaeological studies at the Bloody Falls site did not result in any evidence of the massacre that Hearne mentions during his exploration in the region(McGhee 1970). However there are Copper Inuit burials (MkPk 11) close to the site but are believed to have no connection to the Inuit massacre event.

Numerous sites not specifically mentioned here are also found along the coast of the Coronation Gulf. These sites can be characterized as small campsites or lithic scatters, commonly representing a single event and range in age from ASTt to historic indigenous. Many of the sites tend to be located on blow outs. Features are abundant at these sites as well, such as tent rings and cairns.

4. METHODOLOGY

4.1 Field Inventory and Assessment

All field work was conducted under a valid Class II Archaeological Permit issued by CLEY. The field program focused on the assessment of all areas of high and moderate archaeological potential within the disturbed mining exploration camps, and the proposed borrow source and landfill locations. The purpose of the field investigation was to identify archaeological materials, document location and content and provide data to be used in the development of recommendations for future remediation programs. Inventory and assessment techniques followed established practices and consisted of the following:

- visual examination of the identified areas to determine the presence of such surficial features such as standing or collapsed buildings, dumps, cache pits, cabin foundations, etc. and exposed precontact cultural materials such as stone tool making debris and tools;
- visual examination of the identified areas to determine the presence of items of historical military interest;
- excavation of shovel tests (ca. 40 x 40 cm) to varying depths to determine the potential for subsurface precontact cultural remains if deposition is present;
- visual examination of bedrock exposures (if any) or gravels for precontact quarrying activity;
- excavation of either additional shovel tests or 1 x 1 m units for the purpose of identifying the distribution, density, and nature of cultural remains associated with sites identified through inventory procedures;
- documentation of the location (GPS coordinates), nature, size, and complexity of each identified site; and
- documentation of individual site features to record content, context, potential identity, and to provide information required to develop a mitigation program.

These results, along with updates and recommendations will be included in written submissions to CLEY as required by the Permit to conduct the AIA, and discussed with the Chief Archaeologist of Nunavut.

4.2 Heritage Feature / Structure Evaluation

Evaluations of heritage features and standing structures were to be completed for features/structures that are observed during the investigations. These evaluations would consider perceived heritage resource value and community cultural value as well as the predicted impact from the proposed program. In general, disturbed sites with limited cultural remains would be assigned lower archaeological resource values than undisturbed sites, large sites with large amounts of cultural material, complex sites, and multicomponent sites. Undisturbed multicomponent sites would generally be assigned the highest heritage resource value.

Community input will play a role in the evaluation of site value, and the inclusion of members of the local community on the field crew aided in the in-field discussions regarding site significance.

4.3 Detailed Archaeological Site Investigations / Mitigation

If required, mitigation of heritage resources sites may include several options. Prior to evaluation of these mitigative options, the perceived value of the identified archaeological sites will be discussed with the EBA Engineering Project team and PWGSC to determine the feasibility of avoiding important sites. Only if site avoidance is not possible, will other mitigative measures such as collection and documentation, and controlled mapping/excavation be considered and discussed with CLEY. In areas of no sediment deposition surface collection and mapping of artifacts and features may satisfy regulatory requirements for mitigation. Recommendations for excavation may include a controlled excavation mitigative plan and will specify the number of square metres and suggest locations for excavation units/blocks.

Overall mitigative options may be summarized by:

- collection and documentation undertaken at the time of the field assessment at all sites with low archaeological resource value;
- avoidance if feasible at all sites assigned high archaeological resource value;
- mitigative excavations which will be recommended to CLEY at those sites assigned high archaeological resource value that could not be avoided by borrow source relocation; and
- a management plan for required mitigation relative to the proposed construction schedule that will be discussed with the site project team.

4.4 Reporting

Analysis of collected artifacts includes cleaning, cataloguing, identification, inventory, and description of each individual piece for inclusion in the final report. GPS site information is provided for mapping relative to the former site structures at the site and to CLEY, but not included in the final versions of this report. Archaeological site maps, photographs, and artifact scans are prepared as digital files.

5. RESULTS

Upon completion of the field component and the artifact curation, a draft report has been prepared. This final permit report on the archaeological studies will be forwarded to EBA for review, and then submitted to CLEY for review. This report includes a project description, the environmental setting, the historical and archaeological context for the project area, field methodology, and the results of the field reconnaissance. The report includes descriptive data on the sites, artifacts, and features identified, as well as detailed information on the nature, content, and significance of the artifacts and features identified. Cultural material that was recovered was inventoried, described, and discussed within the report text to aid in evaluation of scientific and interpretive value. All identified sites have been documented on appropriate site inventory forms.

If required, a summary of the findings will be prepared for inclusion in a screening document.

The following workplan was followed:

- avoidance has been recommended where feasible at all sites assigned high archaeological resource value (this to include all constructed features: burials, tent rings, caches, hunting blinds, hearths);
- collection and documentation has been undertaken as a mitigative option of sites with low archaeological resource value and as a method of protecting the heritage resource from future undocumented impacts due to increased personnel activity in the vicinity; and
- acceptable methods of mitigation were discussed with CLEY and the Territorial Archaeologist, and may lead to a recommendation for detailed mapping, collection and/or test excavations at those sites assigned high archaeological resource value that cannot be avoided by reclamation project.

A management plan for required mitigation, monitoring or surveillance relative to the proposed remediation will be developed as part of the contracted services deliverable to PWGSC. This includes site mitigation, additional survey of any project re-locates required due to site avoidance, and verification of those heritage sites located outside the proposed development activity area that should remain outside re-located areas.

A search of the Canadian Museum of Civilization database yielded no information on previously recorded heritage resources sites in the immediate area of the Hope Lake Mining Exploration Camps. As such, no revisits or information updates to existing sites was required.

5.1 Community Consultation

Consultation regarding the Hope Lake Mining Exploration Camps Phase III Environmental Site Assessment, Hazardous and Non-Hazardous Materials Audit, Geotechnical Evaluation, Remedial Action Plan is ongoing.

5.2 Field Results

A search of the Canadian Museum of Civilization database yielded no information on previously recorded heritage resources sites in the immediate area of the Hope Lake Mining Exploration Camps. As such, no revisits or information updates to existing sites was required.

The AIA assessment included all of the areas of moderate to high archaeological potential that has been disturbed by the mining camp locations as well as areas identified as having potential for future borrow sources or dumps. The disturbed areas that were assessed included the Hope Lake camp including the camps, runway, bulk fuel storage tanks, roads as well as the trial from the Hope Lake site to the Willow Creek site. At the Willow Creek and Husky Creek sites the disturbance areas were much more localized and consisted of the remains of building and debris. Previously undisturbed areas that were examined included the periphery of all the impacted areas as well as several areas

that were identified as potential borrow areas or landfills for remediation activities (Plate 16).

Plate 16 View east of potential borrow area at the Hope Lake site with barrel cache in the background.

During the impact assessment of the Hope Lake Mining Exploration Camps no material culture was observed at any of the exploration camp locations that would suggest exploration activities taking place prior to the late 1960's and therefore the sites were not recorded as heritage sites as per the *Nunavut Archaeological and Palaeontological Sites Regulations*. However, there were three heritage resource sites, unrelated to mining exploration, recorded during the survey and they are MiPn 1, MiPn 2 and MiPn 3. MiPn 1 is a is a stone feature site that is made up of four food caches in a boulder field along the southwest shore of Hope Lake and MiPn 2 and MiPn 3 are both made up of a single inukshuk features which are described in more detail below.

5.3 Newly Identified Heritage Resource Site

5.3.1 MiPn 1

MiPn 1 is a stone feature site that is made up of four food caches in a boulder field along the southwest shore of Hope Lake. The four caches have been dug out of the boulders, are all open, and have diameters of between 2 and 2.5 m with depths ranging from 40 to 70 cm (Plates 17 and 18). The features appear to have sufficient lichen growth to indicate that they have been undisturbed. There is no evidence of recent use or of any remaining cultural material. However, three of the caches have slightly enhanced vegetation growth inside the cache area that may be due to organic nutrients that were once present inside, probably from cached meat. MiPn 1 is thought to be of moderate significance and it is recommended that any impacts to the site be avoided. At this time there are no plans to disturb MiPn 1 during the remediation of the Hope Lake Mining Exploration Camps.

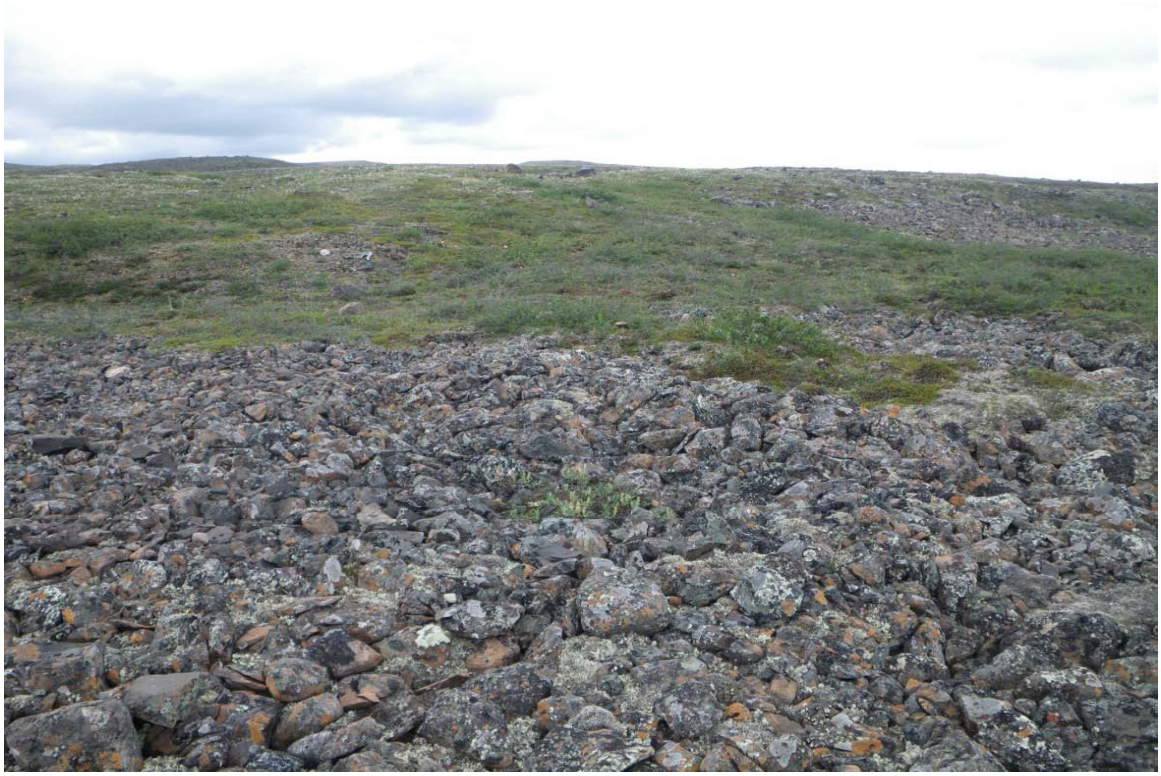


Plate 17 View south of Feature 1, MiPn 1.

Plate 18 View east across MiPn 1 from Feature 4.

5.3.2 MiPn 2

MiPn 2 is a stone feature site that is made up of a single inukshuk on a ridge overlooking the Hope Lake Mining Exploration Camps. The inukshuk is made up of ten stones on top of a large rock (Plate 19). Stones show evidence of age with moss and lichen "fusing" them together. MiPn 2 is thought to be of moderate significance and it is recommended that any impacts to the site be avoided. At this time there are no plans to disturb MiPn 2 during the remediation of the Hope Lake Mining Exploration Camps.

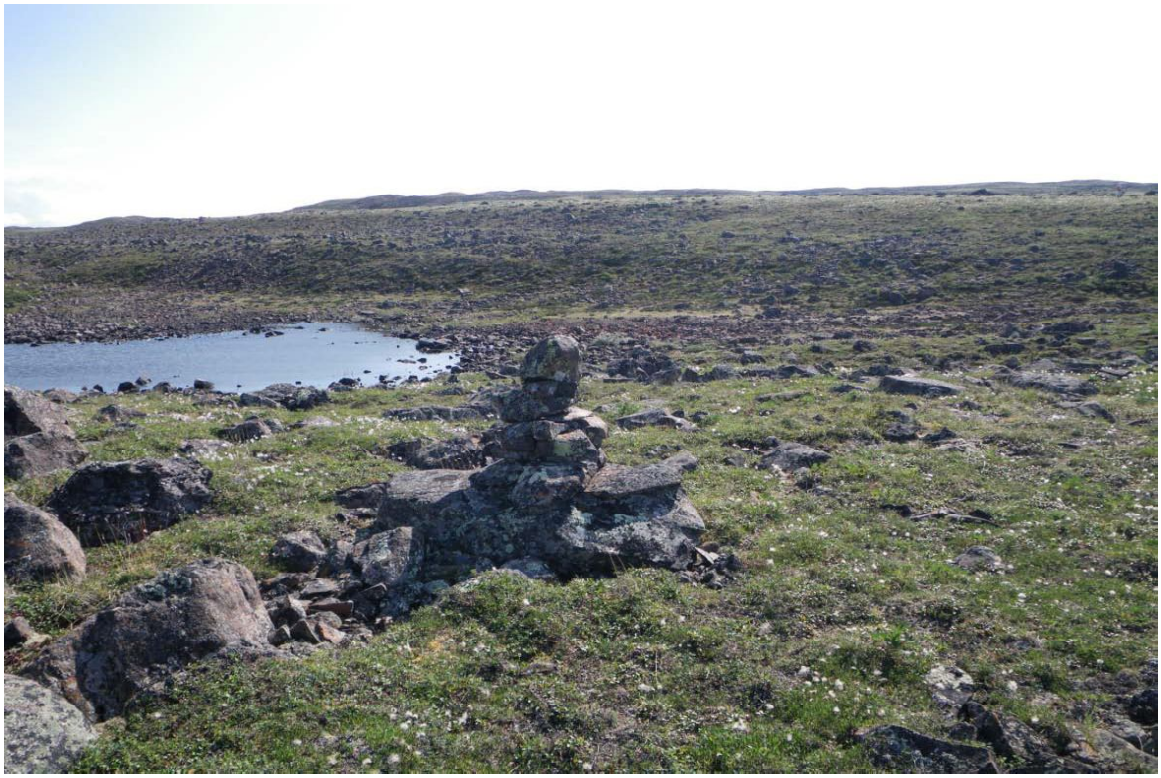


Plate 19 View southeast of MiPn 2.

5.3.3 MiPn 3

MiPn 3 is a stone feature site that is made up of a single inukshuk on a high ridge overlooking the Hope Lake Mining Exploration Camps. The inukshuk is made up of five flat stones and sits on top of a large boulder (Plate 20). Stones show evidence of age with moss and lichen "fusing" them together. MiPn 3 is though to be of moderate significance and it is recommended that any impacts to the site be avoided. At this time there are no plans to disturb MiPn 3 during the remediation of the Hope Lake Mining Exploration Camps.

Plate 20 View southeast of MiPn 3 with Kenny Kuodluak scouting for bears.

6. SUMMARY AND RECOMMENDATIONS

The AIA of the Hope Lake Mining Exploration Camps site conducted under Nunavut Permit 2010-019A produced the results discussed in Section 5 and outlined in Table 1. As requested, areas that will not be impacted during remediation were not fully examined. During the study three heritage resource sites, MiPn 1, MiPn 2 and MiPn 3 were identified and are documented as per the *Guidelines for Applicants and Holders of Nunavut Territory Archaeology and Palaeontology Permits* (Government of Nunavut 2003).

Table 1 Heritage Site Recommendations

Site	Type	Significance	Recommendations
MiPn 1	Stone cache	moderate	Avoidance is recommended
MiPn 2	Inukshuk	moderate	Avoidance is recommended
MiPn 3	Inukshuk	moderate	Avoidance is recommended

PWGSC has fulfilled the requirements to identify the potential for impact to heritage resources during the proposed remediation/reclamation of the Hope Lake Mining Exploration Camps near Dismal Lakes. The AIA of the five camp locations included the participation of Wynn Algona and Kenny Kuodluak from the local community of Kugluktuk, who acted as bear monitors and participated in the identification and recording of the heritage resource sites.

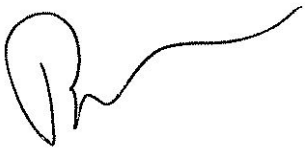
The AIA identified three heritage resource sites, MiPn 1, MiPn 2 and MiPn 3. MiPn 1 is a is a stone feature site that is made up of four food caches in a boulder field along the southwest shore of Hope Lake and MiPn 2 and MiPn 3 are both made up of a single inukshuk features on a landforms overlooking the Hope Lake Mining Exploration Camps. It is recommended that none of the sites be impacted during the remediation of the Hope Lake Mining Exploration Camps.

7. CLOSURE

We trust the above meets your present requirements. If you have any questions or require additional details, please contact the undersigned.

GOLDER ASSOCIATES LTD.

Report prepared by:



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8. REFERENCES

Blower, David

2003 Heritage Resources Studies Mitigation and Assessment 2002, Bathurst Inlet Port and Road Project, Nunavut Permit 02-035A. Department of Culture, Language, Elders and Youth, Iqaluit.

Damas, David

1984 Copper Eskimo. In, *Handbook of North American Indians*, Pp 391 – 396. Smithsonian Institution, Washington.

Fuller, W.A.

1999 Samuel Hearne's Track: Some Obscurities Clarified. *Arctic* 52(3): 257-271.

Geiger, John and Owen Beattie

1994 *Dead Silence.* Penguin Books, Toronto.

Government of Nunavut

2003 Nunavut Archaeological and Palaeontological Sites Regulations. *Guidelines for Applicants and Holders of Nunavut Territory Archaeology and Palaeontology Permits*. Department of Culture, Language, Elders and Youth, Iqaluit.

Grey, David

2005 Coppermine River. In *Encyclopedia of the Arctic: Volume 1 A-F*, Edited by M. Nuttal: 443-444. Routledge, New York

Harp, Elmer

1958 Prehistory in the Dismal Lake Area, N.W.T., Canada. *Arctic* 11(4): 219-249.

McGhee, Robert

1970 Excavations at Bloody Falls, N.W.T., Canada. *Arctic Anthropology* 6(2): 53-72

1990 *Canadian Arctic Prehistory*. Canadian Museum of Civilization, Hull.

2001 *Ancient People of the Arctic*. Paperback Edition, UBC Press, Vancouver.

Natural Resources Canada

2010 Southern Arctic Ecozone. Electronic document http://atlas.nrcan.gc.ca/auth/english/maps/environment/forest/forestcanada/terrestrialecozones/1, accessed September 27, 2010.

Noble, William. C.

1981 Prehistory of the Great Slave Lake and Great Bear Lake Region. In, *Handbook of North American Indians Volume 6, Subarctic*. Pp. 97-129. Smithsonian Institution. Washington.

Speck, G.

1983 Samuel Hearne (1745-1792). *Arctic* 36(1): 100-101.

Wright, J. V.

1995 *A History of the Native People of Canada, Volume I (10,000 – 1,000 B.C.)* Mercury Series, Archaeological Survey of Canada, Paper 152. Canadian Museum of Civilization, Hull.

1999 *A History of the Native People of Canada, Volume II (1,000 B.C. – A.D. 500.)* Mercury Series, Archaeological Survey of Canada, Paper 152. Canadian Museum of Civilization, Hull.

APPENDIX I

PHOTOGRAPH LOG

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log

Number	Project site	Comment
10-019A photo 1	Hope Lake	Hope Lake site
10-019A photo 2	Hope Lake	cabin at the Hope Lake site where equipment is stored
10-019A photo 3	Hope Lake	Hope Lake site
10-019A photo 4	Husky Creek South	Helicopter at the Husky Creek South site
10-019A photo 5	Husky Creek South	Metal stove at the Husky Creek South site
10-019A photo 6	Husky Creek South	View east of plywood walls
10-019A photo 7	Husky Creek South	Heavy equipment at the Husky South site
10-019A photo 8	Husky Creek South	Heavy equipment at the Husky South site
10-019A photo 9	Husky Creek South	View northwest of machinery and barrles
10-019A photo 10	Husky Creek South	View northwest of site area from the east
10-019A photo 11	Husky Creek South	View northwest of site area from the east
10-019A photo 12	Husky Creek South	View northwest of site area from the east
10-019A photo 13	Husky Creek South	View west of site area
10-019A photo 14	Husky Creek South	View north of can dump
10-019A photo 15	Husky Creek South	View northeast of can dump
10-019A photo 16	Husky Creek South	Detail of cans - condensed milk with soldered vent hole
10-019A photo 17	Husky Creek South	View west of barrels and site area
10-019A photo 18	Husky Creek South	View west of machinery
10-019A photo 19	Husky Creek South	View northeast of walls
10-019A photo 20	Husky Creek South	View southwest of propane tank and furnace
10-019A photo 21	Husky Creek South	View southwest of propane tank and furnace
10-019A photo 22	Husky Creek South	Detail of a core tray with cores still on it
10-019A photo 23	Husky Creek South	View northwest from the air of site area
10-019A photo 24	Husky Creek South	View northwest from the air of site area
10-019A photo 25	Husky Creek South	View northwest from the air of site area
10-019A photo 26	Husky Creek North	View southeast of Husky Creek North from the air
10-019A photo 27	Husky Creek North	View southeast of Husky Creek North from the air
10-019A photo 28	Husky Creek North	Remains of the privy
10-019A photo 29	Husky Creek North	View southeast of snow machine
10-019A photo 30	Husky Creek North	View southeast of snow machine
10-019A photo 31	Husky Creek North	View southwest of snow machine
10-019A photo 32	Husky Creek North	View southwest of snow machine
10-019A photo 33	Husky Creek North	View southwest of snow machine
10-019A photo 34	Husky Creek North	View southwest of snow machine
10-019A photo 35	Husky Creek North	Detail of writing on the door of the snow machine
10-019A photo 36	Husky Creek North	View of the front of the snow machine
10-019A photo 37	Husky Creek North	View south of site area with roof of snow machine
10-019A photo 38	Husky Creek North	View southeast of snow machine and site area

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 39	Husky Creek North	Photo of roof showing can dump under the machine
10-019A photo 40	Husky Creek North	Photo of roof showing can dump under the machine
10-019A photo 41	Husky Creek North	Photo of roof showing can dump under the machine
10-019A photo 42	Husky Creek North	View east of site area
10-019A photo 43	Husky Creek North	View northwest of second local at the site
10-019A photo 44	Husky Creek North	View west of site area
10-019A photo 45	Husky Creek North	View northeast of the site area from the air
10-019A photo 46	Husky Creek North	View northeast of the site area from the air
10-019A photo 47	Husky Creek North	View northeast of the site area from the air
10-019A photo 48	Husky Creek North	Photo of barrel southeast of the site area
10-019A photo 49	Willow Lake Main	View north of Willow Lake site from the air
10-019A photo 50	Willow Lake Main	View northwest of Willow Lake site from the air
10-019A photo 51	Willow Lake Main	View northwest of Willow Lake site from the air
10-019A photo 52	Willow Lake Main	View northwest of Willow Lake site from the air
10-019A photo 53	Willow Lake Main	View north of Willow Lake site from the air
10-019A photo 54	Willow Lake Main	View west of Willow Lake site from the air
10-019A photo 55	Willow Lake Main	View south of Willow Lake site from the air
10-019A photo 56	Willow Lake Main	View west of site from a ridge
10-019A photo 57	Willow Lake Main	View north of rock cairn with 2 x 2s
10-019A photo 58	Willow Lake Main	View north of rock cairn with 2 x 2s
10-019A photo 59	Willow Lake Main	View west of lumber pile that appears to have been salvaged from the site
10-019A photo 60	Willow Lake Main	Photo of can dump
10-019A photo 61	Willow Lake Main	View west of core shack
10-019A photo 62	Willow Lake Main	View southwest of core shack
10-019A photo 63	Willow Lake Main	View southwest of core shack
10-019A photo 64	Willow Lake Main	View west of wooden floor
10-019A photo 65	Willow Lake Main	Modern tent ring at site
10-019A photo 66	Willow Lake Main	View west of standing cabin
10-019A photo 67	Willow Lake Main	View south of cabin
10-019A photo 68	Willow Lake Main	View east of cabin
10-019A photo 69	Willow Lake Main	View north of cabin
10-019A photo 70	Willow Lake Main	View east towards site from the west end of the barrels
10-019A photo 71	Willow Lake Main	View east towards site from the west end of the barrels
10-019A photo 72	Willow Lake Main	Photo of can dump at Willow Lake
10-019A photo 73	Willow Lake Main	Scattered wood from core shack and camp
10-019A photo 74	Willow Lake Main	View north of site from base of hill
10-019A photo 75	Willow Lake Main	View north of site from base of hill

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 76	Willow Lake Main	View north of site from base of hill
10-019A photo 77	Willow Lake Main	View northeast from the air of Willow Creek
10-019A photo 78	Willow Lake Main	View northeast from the air of Willow Creek
10-019A photo 79	Willow Lake Main	View northeast from the air of Willow Creek
10-019A photo 80	Willow Lake Main	View northeast from the air of Willow Creek
10-019A photo 81	Willow Lake Main	View northeast from the air of Willow Creek
10-019A photo 82	Willow Lake Main	View northeast from the air of Willow Creek
10-019A photo 83	Willow Lake Main	View northeast from the air of Willow Creek
10-019A photo 84	Willow Lake Main	View northwest from the air of Willow Creek
10-019A photo 85	Willow Lake Main	View northwest from the air of Willow Creek
10-019A photo 86	Willow Lake Main	View northwest from the air of Willow Creek
10-019A photo 87	Willow Creek Southwest Cabin	View southeast of caribou on the ridge
10-019A photo 88	Willow Creek Southwest Cabin	View north of the site from the south
10-019A photo 89	Willow Creek Southwest Cabin	View north of the site from the south
10-019A photo 90	Willow Creek Southwest Cabin	Photo of float plane dock at the south cabin
10-019A photo 91	Willow Creek Southwest Cabin	Photo south of site of a caribou
10-019A photo 92	Willow Creek Southwest Cabin	View east of site from the west
10-019A photo 93	Willow Creek Southwest Cabin	View north of core boxes and remains of core shack
10-019A photo 94	Willow Creek Southwest Cabin	View north of core boxes and remains of core shack
10-019A photo 95	Willow Creek Southwest Cabin	View north of core boxes and remains of core shack
10-019A photo 96	Willow Creek Southwest Cabin	Photo of barrels neat the lake shore
10-019A photo 97	Willow Creek Southwest Cabin	Photo of general south cabin area
10-019A photo 98	Willow Creek Southwest Cabin	
10-019A photo 99	Willow Creek Southwest Cabin	View east of where the cabin used to be, south cabin
10-019A photo 100	Willow Creek Southwest Cabin	View east of where the cabin used to be, south cabin
10-019A photo 101	Willow Creek Southwest Cabin	View east of where the cabin used to be, south cabin
10-019A photo 102	Willow Creek Southwest Cabin	Photo of a bottom fill soldered condensed milk can

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 103	Willow Creek Southwest Cabin	Photo of wood debris
10-019A photo 104	Willow Creek Southwest Cabin	Photo of general area of site with core shack in the background
10-019A photo 105	Willow Creek Southwest Cabin	View northeast of south cabin from the air
10-019A photo 106	Willow Creek Southwest Cabin	View northeast of south cabin from the air
10-019A photo 107	Willow Creek Southwest Cabin	View northeast of south cabin from the air
10-019A photo 108	Willow Creek Southwest Cabin	View northeast of south cabin from the air
10-019A photo 109	Willow Creek South Cabins	View east towards the southeast cabins from outcrop
10-019A photo 110	Willow Creek South Cabins	View east towards the southeast cabins from outcrop
10-019A photo 111	Willow Creek South Cabins	View northeast of site from outcrop along stream
10-019A photo 112	Willow Creek South Cabins	View northeast of site from outcrop along stream
10-019A photo 113	Willow Creek South Cabins	View northeast of modern rock cairn
10-019A photo 114	Willow Creek South Cabins	View northeast of modern rock cairn
10-019A photo 115	Willow Creek South Cabins	View southeast of modern rock cairn
10-019A photo 116	Willow Creek South Cabins	Detail of modern rock cairn
10-019A photo 117	Willow Creek South Cabins	Detail of older rock cairn
10-019A photo 118	Willow Creek South Cabins	View southwest of rock cairns
10-019A photo 119	Willow Creek South Cabins	Detail of older rock cairn
10-019A photo 120	Willow Creek South Cabins	Detail of older rock cairn
10-019A photo 121	Willow Creek South Cabins	Detail of older rock cairn
10-019A photo 122	Willow Creek South Cabins	photo of can dump southeast of outcrop where the cabin is
10-019A photo 123	Willow Creek South Cabins	Photo of core boxes on top of rock outcrop
10-019A photo 124	Willow Creek South Cabins	Photo of core boxes on top of rock outcrop

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 125	Willow Creek South Cabins	Photo of core boxes on top of rock outcrop
10-019A photo 126	Willow Creek South Cabins	View northwest of standing cabin
10-019A photo 127	Willow Creek South Cabins	View northwest of collapsed cabin
10-019A photo 128	Willow Creek South Cabins	photo of camp stove
10-019A photo 129	Willow Creek South Cabins	detail of camp stove
10-019A photo 130	Willow Creek South Cabins	View east of stove and cabin
10-019A photo 131	Willow Creek South Cabins	View east of stove and cabin
10-019A photo 132	Willow Creek South Cabins	Photo of powdered milk can
10-019A photo 133	Willow Creek South Cabins	detail of camp stove
10-019A photo 134	Willow Creek South Cabins	View northeast of standing cabin
10-019A photo 135	Willow Creek South Cabins	View southeast of standing cabin
10-019A photo 136	Willow Creek South Cabins	View southwest of standing cabin
10-019A photo 137	Willow Creek South Cabins	View northwest of standing cabin
10-019A photo 138	Willow Creek South Cabins	View of interior of standing cabin
10-019A photo 139	Willow Creek South Cabins	View east of southeast cabins from the air
10-019A photo 140	Willow Creek South Cabins	View east of southeast cabins from the air
10-019A photo 141	Willow Creek South Cabins	View east of southeast cabins from the air
10-019A photo 142	Willow Creek South Cabins	View east of southeast cabins from the air
10-019A photo 143	Willow Creek South Cabins	View north of southeast cabins from the air
10-019A photo 144	Willow Creek South Cabins	View north of southeast cabins from the air
10-019A photo 145	Willow Creek South Cabins	View north of southeast cabins from the air
10-019A photo 146	Willow Creek South Cabins	View southwest of the southeast cabins from the air

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 147	Willow Creek South Cabins	View southwest of the southeast cabins from the air
10-019A photo 148	Willow Creek South Cabins	View northwest of southeast cabins
10-019A photo 149	Hope Lake	View west of Hope Lake site with two large POL tanks in the photo from the air
10-019A photo 150	Hope Lake	View southwest of POL tanks (2) at Hope Lake from the air
10-019A photo 151	Hope Lake	View west across Hope Lake from the air with POL tanks (6) in the background
10-019A photo 152	Hope Lake	View west across Hope Lake from the air with POL tanks (6) in the background
10-019A photo 153	Hope Lake	View south across site from lake showing debris and crew working - from the air
10-019A photo 154	Hope Lake	View south across site from lake showing debris and crew working - from the air
10-019A photo 155	Hope Lake	View south of north camp area of Hope Lake site form the air
10-019A photo 156	Hope Lake	View south of north camp area of Hope Lake site form the air
10-019A photo 157	Hope Lake	View southeast of people working at the north camp
10-019A photo 158	Hope Lake	View south of feature 1 cache site , MiPn 1
10-019A photo 159	Hope Lake	View north of feature 2 and 3 , MiPn 1
10-019A photo 160	Hope Lake	View northwest over features 2, 3 and 4 , MiPn 1
10-019A photo 161	Hope Lake	View northwest over features 2, 3 and 4 , MiPn 1
10-019A photo 162	Hope Lake	View north of features 2 and 3 , MiPn 1
10-019A photo 163	Hope Lake	Detail of feature 2 with 3 in the background , MiPn 1
10-019A photo 164	Hope Lake	View north of feature 4 , MiPn 1
10-019A photo 165	Hope Lake	View east across site from feature 4 , MiPn 1
10-019A photo 166	Hope Lake	View east across site from feature 4 , MiPn 1
10-019A photo 167	Hope Lake	View west of road close to site MiPn 1
10-019A photo 168	Hope Lake	View east of road close to site MiPn 1

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 169	Hope Lake	View east of dump site showing metal pcs sticking out
10-019A photo 170	Hope Lake	View west at the end of the ploughed road
10-019A photo 171	Hope Lake	View east of road from the western end
10-019A photo 172	Hope Lake	View west of dozer push at the west end of the road
10-019A photo 173	Hope Lake	View northeast across drainage of metal dump
10-019A photo 174	Hope Lake	View northeast across drainage of metal dump
10-019A photo 175	Hope Lake	Photo of dump along the creek at the bottom of the hill
10-019A photo 176	Hope Lake	Photo of dump along the creek at the bottom of the hill
10-019A photo 177	Hope Lake	Photo of a can
10-019A photo 178	Hope Lake	Photo of dump from the top of the bank
10-019A photo 179	Hope Lake	View north of POL tanks
10-019A photo 180	Hope Lake	View northeast from POL tanks
10-019A photo 181	Hope Lake	View northeast from POL tanks
10-019A photo 182	Hope Lake	View northeast of barrel dump
10-019A photo 183	Hope Lake	View northeast of barrel dump
10-019A photo 184	Hope Lake	Photo of an old cat
10-019A photo 185	Hope Lake	Photo of barrel dump showing some of the other material
10-019A photo 186	Hope Lake	View east of potential borrow area
10-019A photo 187	Hope Lake	View south of potential borrow area
10-019A photo 188	Hope Lake	View southeast of Inukshuk on bolder ridge , MiPn 2
10-019A photo 189	Hope Lake	Detail of inuksuk , MiPn 2
10-019A photo 190	Hope Lake	View northwest of inuksuk , MiPn 2

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 191	Hope Lake	View southeast of modern stone feature
10-019A photo 192	Hope Lake	View southeast of modern stone feature
10-019A photo 193	Hope Lake	Detail of stone feature
10-019A photo 194	Hope Lake	View northwest of stone feature
10-019A photo 195	Hope Lake	Photo of core shack that had burned down
10-019A photo 196	Hope Lake	View northwest from bolder field towards HTO cabin
10-019A photo 197	Hope Lake	View northwest from bolder field towards HTO cabin
10-019A photo 198	Hope Lake	View southeast of burned down camp with sausage tanks and HTO cabin the background
10-019A photo 199	Hope Lake	View southeast of burned down camp with sausage tanks and HTO cabin the background
10-019A photo 200	Hope Lake	View east of the remains of mining camp near the HTO cabin
10-019A photo 201	Hope Lake	View east of the remains of mining camp near the HTO cabin
10-019A photo 202	Hope Lake	Photo of canoe on site
10-019A photo 203	Hope Lake	Photo of canoe on site
10-019A photo 204	Hope Lake	View northwest of HTO cabin
10-019A photo 205	Hope Lake	View southeast from a hill towards the 1980's camp
10-019A photo 206	Hope Lake	View southeast from a hill towards the 1980's camp
10-019A photo 207	Hope Lake	View southeast from highest hill in the camp area
10-019A photo 208	Hope Lake	View east of 1980's camp from the hill
10-019A photo 209	Hope Lake	View northwest of main camp from hill
10-019A photo 210	Hope Lake	View northwest of main camp from hill
10-019A photo 211	Hope Lake	View east of pushed road with a borrow beside it
10-019A photo 212	Hope Lake	View east of pushed road with a borrow beside it

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 213	Hope Lake	View of borrow beside road
10-019A photo 214	Hope Lake	Photo of washed out culverts
10-019A photo 215	Hope Lake	View northwest of shop tent and office
10-019A photo 216	Hope Lake	View northwest of office and core boxes
10-019A photo 217	Hope Lake	View northwest of shop tent and office
10-019A photo 218	Hope Lake	View southwest of kitchen and staff tents
10-019A photo 219	Hope Lake	View southwest of kitchen and staff tents
10-019A photo 220	Hope Lake	View southeast of debris between office and shop tents
10-019A photo 221	Hope Lake	View northeast of core boxes
10-019A photo 222	Hope Lake	View northeast across borrow source at exploration camp
10-019A photo 223	Hope Lake	View northeast across borrow source at exploration camp
10-019A photo 224	Hope Lake	View northeast of POL tanks with Kenny on top looking for bears
10-019A photo 225	Hope Lake	View northeast of POL tanks with Kenny on top looking for bears
10-019A photo 226	Hope Lake	View northeast of Inuksuk that Kenny spotted , MiPn 3
10-019A photo 227	Hope Lake	View northeast of Inuksuk that Kenny spotted , MiPn 3
10-019A photo 228	Hope Lake	View southwest of Inuksuk with Kenny looking for bears , MiPn 3
10-019A photo 229	Hope Lake	View southwest of Inuksuk with Kenny looking for bears , MiPn 3
10-019A photo 230	Hope Lake	View east of borrow beside runway with plane in the background
10-019A photo 231	Hope Lake	View southeast of borrow beside runway with barrel dump in the background
10-019A photo 232	Hope Lake	Photo of fuel tank from Rayrock
10-019A photo 233	Hope Lake	View north of barrel dump close to runway with Skyvan in the background
10-019A photo 234	Hope Lake	View north of barrel dump close to runway with Skyvan in the background

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 235	Hope Lake	View north of barrel dump close to runway with Skyvan in the background
10-019A photo 236	Hope Lake	View south of "OSC" in stones on the slope
10-019A photo 237	Hope Lake	View north of "OSC" in stone on slope looking downward
10-019A photo 238	Hope Lake	View northwest of debris
10-019A photo 239	Hope Lake	Photo of man made rock cairn - modern
10-019A photo 240	Hope Lake	View northwest of runway from trail that extends from runway
10-019A photo 241	Hope Lake	View northwest of prospector's tent ring
10-019A photo 242	Hope Lake	View north of prospector's tent ring
10-019A photo 243	Hope Lake	View northeast of prospector's tent ring
10-019A photo 244	Hope Lake	Detail of tent ring
10-019A photo 245	Hope Lake	Detail of tent ring and wooden peg
10-019A photo 246	Trail between Hope Lake and Willow Lake	Photo of trail - no way point
10-019A photo 247	Trail between Hope Lake and Willow Lake	View southwest of trail from the air
10-019A photo 248	Trail between Hope Lake and Willow Lake	View southwest of trail from the air
10-019A photo 249	Trail between Hope Lake and Willow Lake	Photo of trial along the edge of the lake
10-019A photo 250	Trail between Hope Lake and Willow Lake	Photo of trial along the edge of the lake
10-019A photo 251	Trail between Hope Lake and Willow Lake	View northwest of trail from Willow Lake showing muddy area
10-019A photo 252	Trail between Hope Lake and Willow Lake	View northwest of trail from Willow Lake showing muddy area
10-019A photo 253	Trail between Hope Lake and Willow Lake	View northwest of trail with helicopter
10-019A photo 254	Trail between Hope Lake and Willow Lake	View northwest of trial in wet area
10-019A photo 255	Trail between Hope Lake and Willow Lake	View northwest of trial in wet area
10-019A photo 256	Trail between Hope Lake and Willow Lake	View northwest of small creek crossing

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 257	Trail between Hope Lake and Willow Lake	View northwest of small creek crossing
10-019A photo 258	Trail between Hope Lake and Willow Lake	View northwest of trail with some wood debris
10-019A photo 259	Trail between Hope Lake and Willow Lake	View northwest of trail with some wood debris
10-019A photo 260	Trail between Hope Lake and Willow Lake	View northwest of trail over higher land forms
10-019A photo 261	Trail between Hope Lake and Willow Lake	View northwest of trail over higher land forms
10-019A photo 262	Trail between Hope Lake and Willow Lake	View northwest of trail along braided stream
10-019A photo 263	Trail between Hope Lake and Willow Lake	View northwest of trail along braided stream
10-019A photo 264	Trail between Hope Lake and Willow Lake	View northwest of trail along unnamed lake
10-019A photo 265	Trail between Hope Lake and Willow Lake	View northwest of trail along unnamed lake
10-019A photo 266	Trail between Hope Lake and Willow Lake	View northwest of trail along unnamed lake
10-019A photo 267	Trail between Hope Lake and Willow Lake	View northwest of trail along unnamed lake
10-019A photo 268	Trail between Hope Lake and Willow Lake	View northwest of trail crossing highlands
10-019A photo 269	Trail between Hope Lake and Willow Lake	View northwest of trail crossing highlands
10-019A photo 270	Trail between Hope Lake and Willow Lake	View west across creek crossing
10-019A photo 271	Trail between Hope Lake and Willow Lake	View west across creek crossing
10-019A photo 272	Trail between Hope Lake and Willow Lake	View west across creek crossing
10-019A photo 273	Trail between Hope Lake and Willow Lake	View west of trail from creek
10-019A photo 274	Trail between Hope Lake and Willow Lake	View west of trail from creek
10-019A photo 275	Trail between Hope Lake and Willow Lake	Photo of creek crossing
10-019A photo 276	Trail between Hope Lake and Willow Lake	View west across creek crossing
10-019A photo 277	Trail between Hope Lake and Willow Lake	View west across creek crossing
10-019A photo 278	Trail between Hope Lake and Willow Lake	View northeast of ploughed road at the end of airstrip

Table I-1 Hope Lake Mining Exploration Camps AIA Photo Log (continued)

Number	Project site	Comment
10-019A photo 279	Trail between Hope Lake and Willow Lake	View northeast of ploughed road at the end of airstrip
10-019A photo 280	Trail between Hope Lake and Willow Lake	View northeast of ploughed road at the end of airstrip
10-019A photo 281	Trail between Hope Lake and Willow Lake	Bears on east side of the creek close to the trail crossing
10-019A photo 282	Trail between Hope Lake and Willow Lake	Bears on east side of the creek close to the trail crossing
10-019A photo 283	Trail between Hope Lake and Willow Lake	Bears on east side of the creek close to the trail crossing
10-019A photo 284	Trail between Hope Lake and Willow Lake	Bears on east side of the creek close to the trail crossing
10-019A photo 285	Trail between Hope Lake and Willow Lake	Creek looking north at trail crossing
10-019A photo 286	South of Hope Lake	Photo of drill site showing debris and copper
10-019A photo 287	South of Hope Lake	Photo of copper in rock sample
10-019A photo 288	South of Hope Lake	Photo of drill site showing debris in the general area
10-019A photo 289	South of Hope Lake	Photo of copper in bedrock
10-019A photo 290	South of Hope Lake	Photo of copper in bedrock
10-019A photo 291	South of Hope Lake	View southwest of Kenny and Patrick looking around outcrop
10-019A photo 292	South of Hope Lake	Drill site with larger casing (2 1/2") and newer debris (Gatoraid bottles)
10-019A photo 293	South of Hope Lake	Drill site with larger casing (2 1/2") and newer debris (Gatoraid bottles)
10-019A photo 294	South of Hope Lake	Debris including cat train sled
10-019A photo 295	South of Hope Lake	Debris including cat train sled
10-019A photo 296	South of Hope Lake	Drill site with flagging tape - may be mentioned in the WESA report
10-019A photo 297	South of Hope Lake	View south of drill site with barrel dump in the background