ARCHAEOLOGICAL IMPACT ASSESSMENT

U.S. COAST GUARD LORAN STATION, CAPE CHRISTIAN
SITE REMEDIATION PROGRAM

PERMIT 06-026A

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Prepared For

Public Works and Government Services Canada, Western Region
10025 Jasper Avenue
Edmonton, Alberta

On Behalf Of

Indian and Northern Affairs Canada

Prepared By

FMA Heritage Resources Consultants Inc.
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October 2006

October 18, 2006

Manager, Environmental Engineering
Public Works and Government Services Canada
Northern Contaminated Sites Program
10025 Jasper Avenue, 5th Floor
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Attention: Mr. Jared Buchko

Dear Mr. Buchko:

I am pleased to submit to you this report entitled ***Archaeological Impact Assessment U.S. Coast Guard LORAN Station, Cape Christian Site Remediation Program.*** Should you have any questions, please do not hesitate to contact me.

Sincerely yours,

FMA HERITAGE RESOURCES CONSULTANTS INC.

Gloria J. Fedirchuk, Ph.D.
/g

Executive Summary

An archaeological resources impact assessment was completed on U.S. Coast Guard LORAN Station (Cape Christian). A site file search of the corresponding 1:250,000 NTS map sheets was completed to determine the nature and location of previously recorded sites in the region. The field study focused on areas of existing and proposed disturbances in area of the station.

Occupation and use of the U.S. Coast Guard LORAN station has resulted in extensive disturbance. Numerous beach and tundra locations associated with borrow areas were disturbed by grading and other vehicular traffic as well as borrow activities. Existing borrow areas have been largely disturbed surficially by grading; areas of additional borrow activity will not impact previously undisturbed areas. The remaining areas surrounding the station, seasonal drainages and roads are all associated with disturbances.

No archaeological or historic sites were identified during the field reconnaissance in the areas of proposed activities. However, a revisit and re-evaluation of OdDm 1 was conducted. It is recommended that all traffic and remediation activities avoid the site area. In the event that avoidance is not feasible, further study is recommended. Of particular concern are remediation activities that would involve removal of the flag poles and the antenna platform as disturbance of soils in these areas would impact intact archaeological remains. Depending on the final remediation plan, detailed site mapping may also be warranted.

Project Personnel

PERMIT HOLDER	:	G. J. Fedirchuk, Ph.D.
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INTRODUCTION

At the request of Public Works and Government Services Canada, Western Region on behalf of Indian and Northern Affairs Canada (INAC) an archaeological impact assessment (Nunavut Territory Archaeologist Permit 2006-26A) was conducted of the proposed site remediation program at former U.S. Coast Guard LORAN Station, Cape Christian, Nunavut. Situated on the eastern coast of Baffin Island, this facility is approximately 16 kilometers east of the community of Clyde River (Figure 1). It was utilized by the U.S. Coast Guard between 1954 and 1974. The station consists of the main station, garage, Hazmat Building, terminal building, survival hut, airstrip, access roads, water reservoir, fuel tanks, landfills, borrow areas, and waste dumps.

The proposed remediation program will entail a construction camp, demolition of all structures and utilities with the exception of the Hazmat Building which is to be retained as an emergency shelter, disposal of equipment and equipment dump, closure and/or capping of existing landfills, construction of a new landfill, collection and sorting of dump remains, deposition of waste and contaminated soils in both on and off site facilities, and development of both existing and new borrow areas. Excavated areas will be backfilled with clean fill and graded and contoured consistent with local topography. Non-hazardous waste will be placed in an on site landfill and covered with local borrow materials. Excavated, secure, disposal facilities will require more

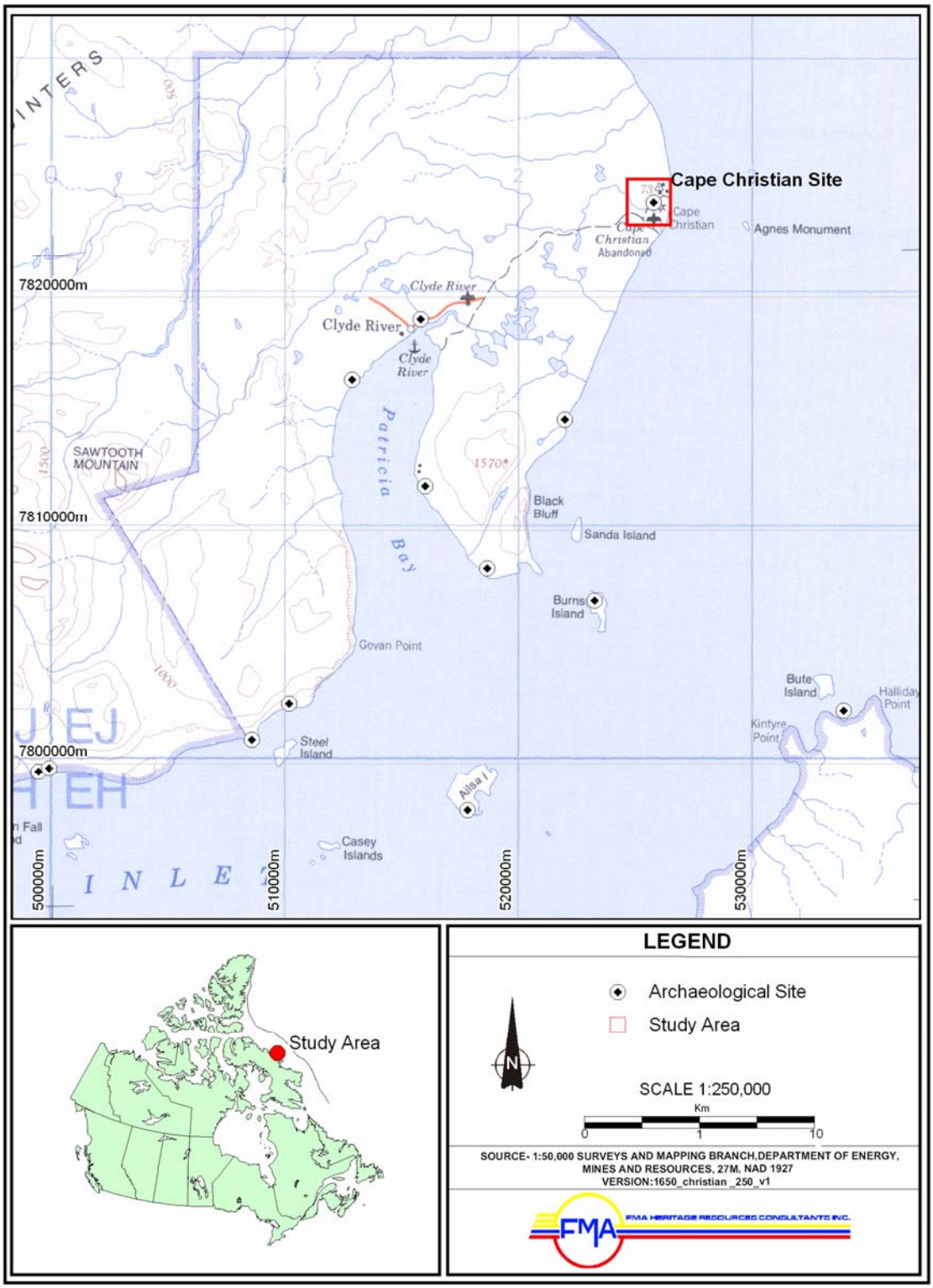

Figure 1 Location of former US Coast Guard LORAN Station at Cape Christian

extensive preparation both to subsurface and surface deposits and will be bermed with local borrow materials. It is unknown whether upgrading of the existing access road between Clyde River and the facility will be required.

OBJECTIVES

The objectives of the study were to document any previously recorded archaeological and historic sites relative to the program facilities, assess the potential for occurrence of additional currently unidentified heritage resource sites in the project area, and to complete an impact assessment of any sites identified. Specifically, the field program was designed to provide information on both existing disturbed and intact sites, determine site types, site nature and association, site context, and potential site values. These data were used to evaluate the impact of the remediation program on specific heritage resource sites identified and on the regional data base.

ENVIRONMENTAL SETTING

INTRODUCTION

Precontact economic strategies as well as many aspects of the material culture of the human inhabitants were intimately related to the opportunities and constraints provided by the regional environment which they occupied. In many respects, regional environment also strongly influenced where certain activities were conducted and consequently, where archaeological sites, testimony to precontact use and occupation, are located. The distribution of precontact sites in the barren grounds includes a wide variety of landforms but sites are most frequently associated with coastlines and lake shores, river banks, eskers and kames, and bedrock knolls. This distribution pattern partially reflects environmental opportunities presented to human populations as well as cultural preferences in site location. Terrain influenced many forms of human activity, directing travel, biasing routes of communication, enhancing or limiting resource procurement activities, and restricting human occupation areas to selected localities. As a result, human populations were not uniformly distributed across the landscape, but were non-randomly clustered within the most suitable habitats. Because of the close relationship which precontact occupants had with the environment, a brief description of the regional and local environments is provided.

REGIONAL ENVIRONMENT

Cape Christian is located on the north shore of Clyde Inlet, northeastern coast of Baffin Island. It is contained within the Baffin Coastal Lowland of the Canadian Shield physiographic region as defined by Bostock (1970) (Figure 2). All of the area is characterized by Precambrian rock representing three periods of mountain-building over two billion years. The Baffin Coastal Lowland (Andrews 1989) consists of discontinuous segments of forelands of Quaternary and potentially late Tertiary deposits of glacial, marine and terrestrial origin behind which steep bedrock slopes occur. The forelands consist of primarily flat, undulating terrain. Some of the fjords in the middle portion of the coast feature steep cliffs that fall directly into the ocean.

Lying within the Churchill Province as defined by Stockwell (1970), the project area is also associated with the Northern Arctic Ecozone which supports discontinuous low shrub tundra complex vegetation. Bedrock outcrops are common.

The study area generally lies within the Foxe Glaciation area of influence. However, locally specific patterns of glacial action and effects are evident. Some of the deep fjords and valleys on eastern Baffin Island are the direct result of glacial scouring. At Patricia Bay to the west of the project area, moraines indicate an ice out flow whereas an ice marginal lake was formed to the southwest of the bay (Briner, Miller, Davis and Finkel 2005). To the northwest, ice from the interior of Baffin Island (Ayr Lake lobe) pushed eastward into Baffin Bay via the Kogalu River valley. Glacial scouring is more characteristic of these two routes of ice movement whereas in the intervening areas, scouring is in little evidence. The dates of deglaciation of these two areas is approximately 12,000 to 15,000 years ago. A third route of ice movement from the interior into the bay was via the Kuvinilk River and is expressed as occasional occurrences of erratics and meltwater channels. This research indicates that the study area is relatively unscoured but Briner, Miller, Davis and Finkel (2005: 81) suggest that the lowlands were covered during the last maximum of the Laurentide ice. Dates on lake cores from the

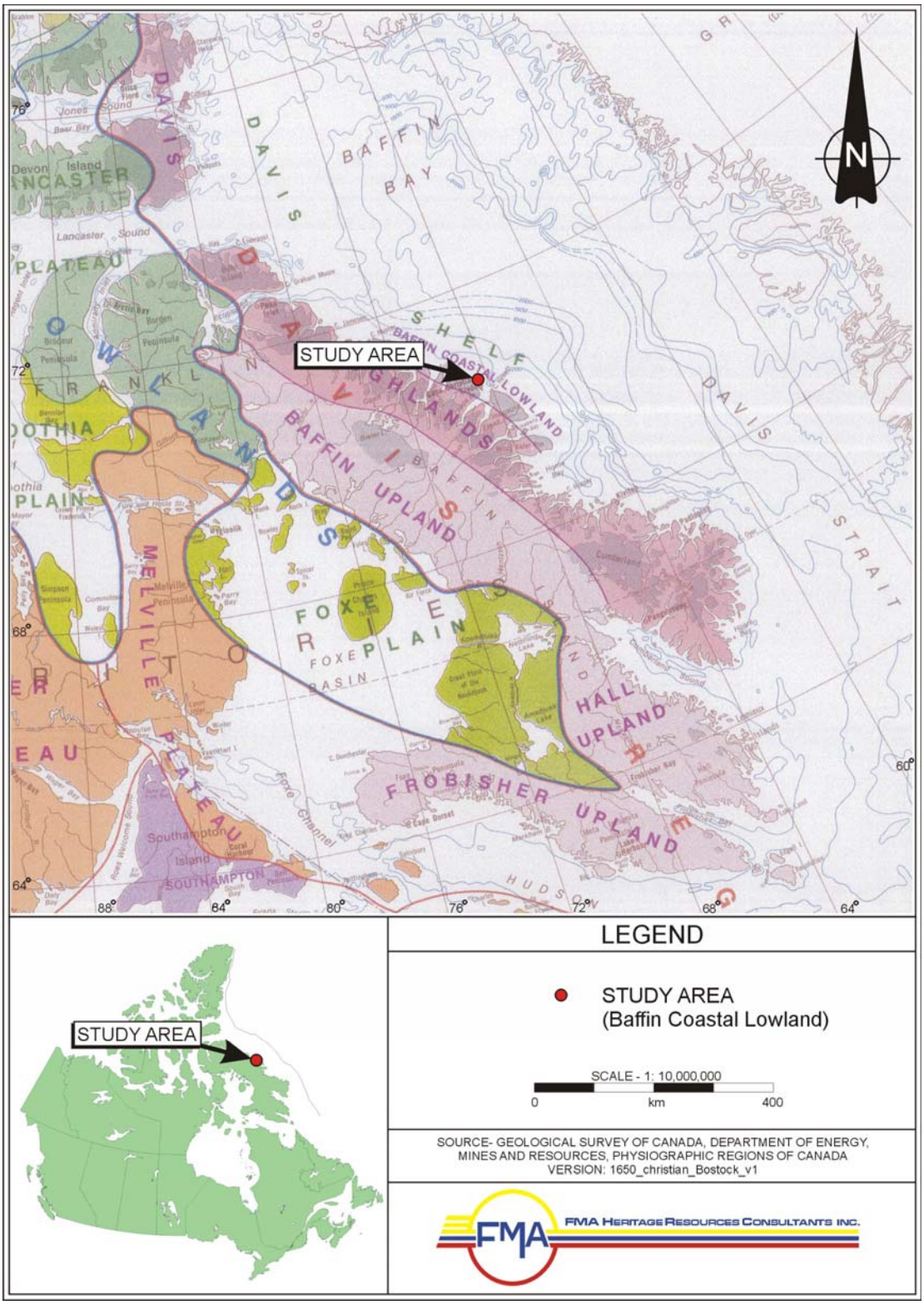

Figure 2 Project area relative to physiographic zones

Aston Lowland and Clyde Foreland indicate deglaciation of the outer coast was completed before 12,000 years ago and the heads of fjords were ice free by about 8,600 years ago (Coulthard et al. 2004).

PROJECT ENVIRONMENT

The former LORAN Station at Cape Christian is located on a beach ridge with extensions down to the shore along Davis Strait (Figure 3). The main facility is located on top of the oval ridge (Plates 1, 2). A highly dissected lower beach ridge fronts the coast line and extends approximately 400 meters to the north along the Davis Strait coast (Plate 2) to a seasonal drainage (Plate 3). A roadway from the main facility to the beach transects this feature (Plate 4). Below the ridge to the south is a lower and flatter bench cut by an ephemeral drainage just south of the end of the airstrip (Plate 5). South of the drainage topography rises again to an elongated knoll (Plate 6). Much of the beach area south of the station has been extensively disturbed as a result of past use of the facility (Plates 7, 8).

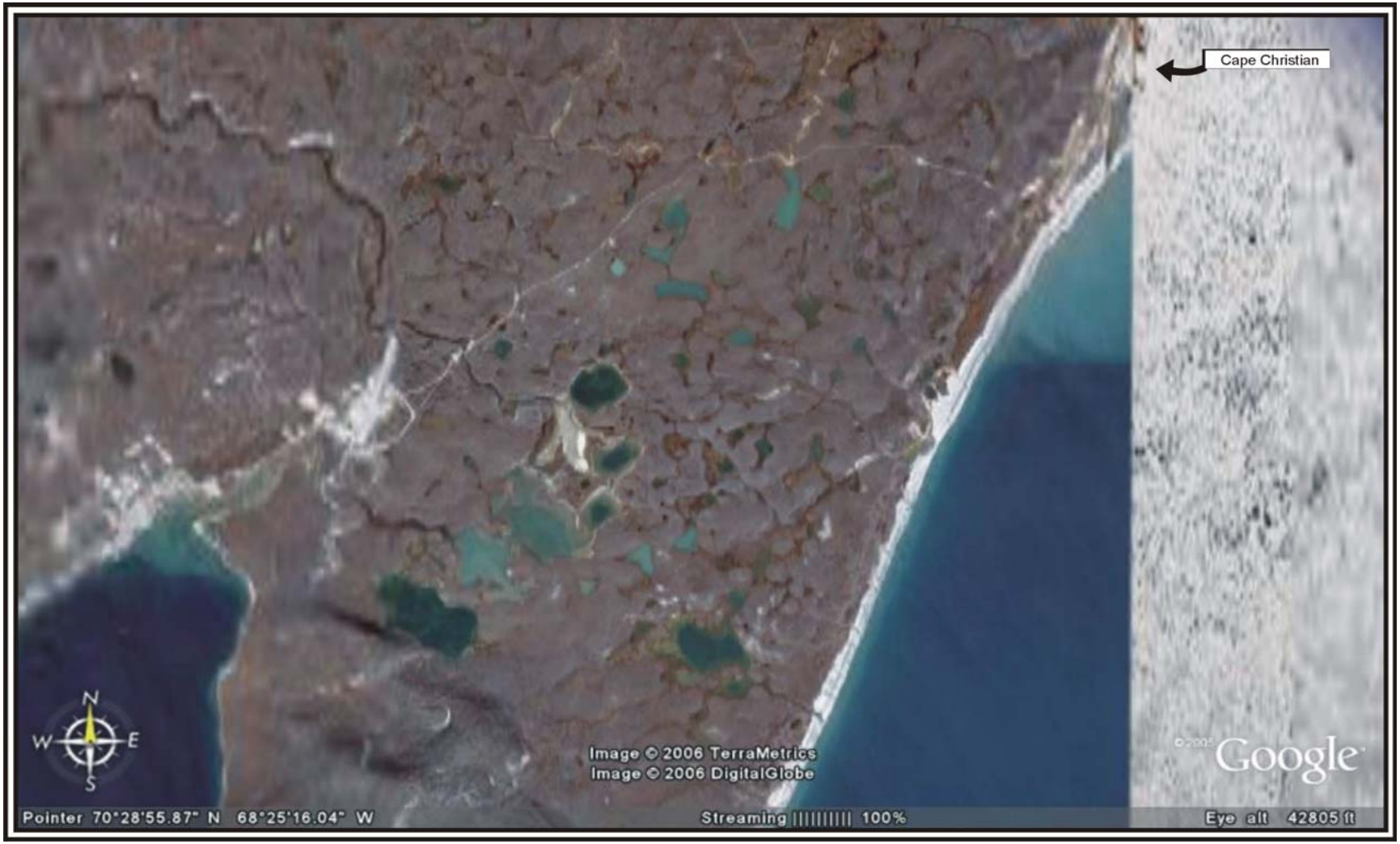

Figure 3 Aerial view of Cape Christian LORAN Station facility (earth.google.com).

Plate 1 View north of main LORAN station facilities on ridge in background. Dam at midground; airstrip at right.

Plate 2 View east of LORAN station and highly dissected ridge edge.

Plate 3 Drainage north of LORAN station. General view southwest.

Plate 4 Roadway leading down to beach from main station, general view northwest.

Plate 5 Ephemeral stream channel through low beach ridge south of main station. General view southeast.

Plate 6 General view south along beach.

Plate 7 General view south showing extent of disturbance in beach area.

Plate 8 General view southwest showing extent of disturbance in beach area.

HERITAGE RESOURCES

DEFINITION

Heritage resources are identified by the Nunavut Archaeological and Palaeontological Sites Regulations (2001) and consist of archaeological artifacts more than 50 years old and fossils including natural casts, preserved tracks, coprolites, and plant remains as well as shells, exoskeletons of invertebrates, and vertebrate remains. Precontact archaeological sites are comprised of artifacts, features, and residues of native origin. They predate the arrival of Europeans and are typically characterized by modified bone and stone, and stone structures. Historic sites are characterized by structures, features, and objects of European influence. These sites date back to contact with the Europeans but also include remains of more recent activity (i.e. more than 50 years). Historic sites less than 50 years old are generally associated with traditional land use and document continued use and occupation of an area to the present time. Cultural landscapes consisting of either natural or man made features important to societies' sense of place are also important heritage resources. Although palaeontological sites contain fossils of plants or animals or fossilized evidence of their existence, also of geological interest are type sites for geological formations.

NATURE OF HERITAGE RESOURCES

Heritage resources are nonrenewable 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.

CULTURAL CONTEXT

PRECONTACT CHRONOLOGY

The cultural chronology of the eastern arctic reflects an increasing adaptation to arctic maritime environment. Present evidence indicates that Eskimoid peoples (archaeologically recognized as Arctic Small Tool Tradition), ultimately related to older populations of northeastern Asia, entered the western arctic and occupied the Alaska coast. Derivatives of this PaleoEskimo culture rapidly spread eastward and reached the eastern arctic, including Greenland, by 2500 B.C. (Maxwell 1984: 359). Locally identified by different archaeological names, it represents a homogeneous adaptation to the environment and a way of life (McGhee 1996).

The archaeological sequence in the eastern arctic begins with Arctic Small Tool tradition materials termed Independence I (2000 – 1600 B.C.) left by the earliest occupants of the High Arctic. With cultural origins to the west, this

tool kit is characterized by burin and microblade technology, side blade insets probably for harpoons, tools for working bone, antler, and ivory, and distinctive scraping and cutting tools. Although few organic items have been preserved, they undoubtedly occurred in the form of bone, antler and ivory fore shafts, arrow tips, and harpoon heads. Based on the results of excavations at Port Refuge (McGhee 1979) on northwestern Devon Island, these early occupants were primarily musk ox hunters. At Port Refuge, a linear arrangement of houses containing internal stone fire boxes associated with distinctive non-toggling harpoon heads serve to distinguish this occupation from later PreDorset remains containing clustered houses and toggling harpoon heads (Maxwell 1984).

Some of the earliest PreDorset sites in the vicinity of the study areas are the Closure Site and the Mittimatalik Site on the south and northeast coasts of Baffin Island, respectively, and the Parry Hill Site near Igloolik. These sites all date from 2500 B.C. to 2000 B.C. PreDorset subsistence economy focused primarily on seal and walrus at seacoast locations with potentially some local use of beluga and narwhal. Remains of musk ox, caribou, and polar bear taken by bow and arrow and lances, as well as birds, also occur in site middens. The tool assemblage contains self bladed open socket bone and ivory harpoons with single or bilateral barbs, bows and composite arrows; microblades, burins, and burin spall awls of quartz crystal, chert drills, and ground slate knives. Chert end blades in the assemblages are thin, slender double tapered or triangular shaped, often exhibiting polished facets on both faces and finely serrated edges. Also present are numerous bone awls and ivory needles with round cross sections, small eyes and blunt butt ends. Small, oval to round, soapstone lamps occur sporadically. Art work is predominantly geometric and appears on needle cases and caribou scapula. Summer sites are characterized by small oval tent rings whereas winter ‘houses’ are oval with mid passages and stone slab fireboxes.

The transition to the succeeding Dorset culture (800 – 500 B.C.) is gradual with many traits from PreDorset components being retained and slowly replaced by new forms. In general, Dorset (500 B.C. to A.D. 1400) is characterized by the introduction and continuity of tools and equipment

specifically suited to winter hunting, particularly sea-ice hunting. For example, bone sled shoes, snow knives, and ice creepers appear. An emphasis on seal hunting is apparent. Fishing figured prominently in subsistence practices as sites associated with fish weirs are common. Shelters consisted of snow block winter houses or are evidenced by small circles outlined by large boulders, small rock ovals or large rectangular features with internal compartments. Summer habitations generally are associated with small circle tent rings. Burials with grave offerings occur occasionally. Art objects, either as three dimensional carvings or decoration of utilitarian items, are notable.

Beginning about A.D. 1000, Thule Culture (NeoEskimo) originating in coastal Alaska moved eastward to rapidly and effectively replace the Dorset people within 200 to 300 years (McGhee 1984). The cultural remains of these newcomers document an economy and technology uniquely adapted to sea mammal hunting, specifically whales. It is postulated that the primary route of these migrants passed eastward through Lancaster Sound to terminate in the Smith Sound area of Greenland. Small clusters of semi-subterranean stone and whale bone houses with stone floors and rear sleeping platforms are characteristic. Soapstone lamps appear to have been borrowed from their predecessors. Whale bone and ivory tools, implement components, and decorative items abound in Western Thule sites. Thule remains are by far the most prevalent archaeological materials reported by early investigators in the Arctic (Rasmussen 1929, 1931; Mathiassen 1927, 1928). A secondary route passed along the eastern side of Baffin Island and resulted in the population of the eastern arctic moving to the areas of Chesterfield Inlet and Ungava Peninsula on Hudson Bay and Baffin Island and Labrador to the east by A.D. 1200 to 1300 (McGhee 1984). Sites outside of the bowhead whale feeding range indicate subsistence based on caribou, fish, and ringed seal. Several important sites of Thule Culture occur on the southern and northern coasts of Devon Island and northern Baffin Island and on the shores of northwestern Greenland. As with PaleoEskimo materials, very few Thule sites have been investigated archaeologically. Many aspects of material and interpreted social culture as well as occupation and land use patterns of these ancestors of the Inuit have not been researched or documented in detail.

Sometime after approximately A.D. 1200, the islands north of Parry Channel were abandoned. Because gradual decline in climatic conditions and increased sea-ice accumulation retarded melting of summer ice pack, whale movement was inhibited which resulted in a concomitant decline in whaling activities as well as hunting of other sea mammals (McGhee 1984). The succeeding transition from Thule to historic Eskimo (Inuit) in the central arctic is characterized by a greater dependence on land animals and winter sealing activities except in the area of Boothia Peninsula where earlier whale hunting traditions had never been established. In the 1860s, northern Baffin Inuit attempted to reoccupy the northern edges of Lancaster Sound (McGhee 1996). For the three years they exploited the eastern portions of Devon and Ellsmere islands, eventually settling in northwestern Greenland.

HISTORY

Departing the newly founded Norse colony on Greenland in 1001, Leif Ericsson stopped at Baffin Island prior to continuing southward to Labrador and Newfoundland in search of timber (Oswalt 1979). It was known to the Norse as *Helluland* (Golay and Bowman 2003). Over 500 years later, a search for a northwest passage encouraged more diligent explorations in the area of Baffin Island. Martin Frobisher set sail from London in 1576 at the request of Queen Elizabeth on the *Gabriel* accompanied by the *Michael.* Weathering a severe storm off southern Greenland, the *Gabriel* subsequently sailed into what is now known as Frobisher Bay where the crew was confronted by the resident Inuit. It was Frobisher's sail master Christopher Hall, however, that provided the first description of the local population as a result of his visit with them. Materials collected by Frobisher resulted in the embarkation of a gold mining venture in 1577 and 1578. Structures were built to house the crew and excavations made for a ship slipway, facilitating ore loading and for mining the ore.

Frobisher was followed by John Davis in 1585 in quest of the northwest passage, also financed by Queen Elizabeth. During three voyages west of Greenland, Davis recorded accessing Cumberland Sound, the Labrador fishing grounds and Hudson Strait. Both Henry Hudson in 1610 and Thomas Button in 1612 were sponsored by private investors in London, *The Company of Merchants of London, Discoverers of the North-West Passage*. William Baffin accompanied Davis on the journey to Greenland in 1612 and Robert Bylot in 1615 when the *Discovery* sailed to Southampton Island in Hudson Strait. In 1616, Baffin surveyed the eastern coast of the island into the northern reaches of Smith Sound. The earliest descriptions of the local inhabitants were penned by members of the early explorations.

Although portions of the shoreline of Baffin Island were mapped by these early explorers, no directed effort in exploring the region occurred until the mid 1800s. At this time there was a renewed interest in the Northwest Passage, beginning in the first quarter of the 19th century, which initiated additional exploration and produced the most detailed descriptions of the Aboriginal peoples (Mathiassen 1927, 1928, 1930; Boas 1888; Hall 1865). However, the area is perhaps best known historically for the ill-fated expedition of Sir John Franklin and the subsequent search efforts in the mid 1800s.

Contact between local populations and early explorers was initiated by Frobisher in 1576 but a greater European presence and consequent effect on the resident Inuit did not occur until later whalers, traders, and missionaries entered the area (Inuit Tapirit Kanatami 2006). Northern Baffin Island and the Davis Strait area were probably initially visited by British whalers in the mid 1700s (Lubbock 1937). Initially, whaling was a seasonal activity; the ships arrived at breakup and departed with ice formation. Exploitation of the bowhead whale continued until the latter half of the 19th century. It is suggested that whaling ship wrecks provided much useful materials for the local Inuit at that time (Ross 1979). However, after 1850, the pattern shifted to year round whaler presence at shore stations resulting in serious over-harvesting of whales. With the decline in harvest and a concomitant decline in whale oil market, resident whalers turned to trapping of arctic fox to make up the short fall.

Because of whaling activity in the Cumberland Sound and Davis Strait region between 1700 and 1850, the local populations were familiar with available European technology. By 1900, the fur trade was entrenched in the area and trading posts were established at such locations as Lake Harbour, Cape Dorset, Clyde River, Pond Inlet, Coral Harbour and Igloolik. Early trading activity was largely focused on the Middle Savage Islands and Big Island to the south of the study area (Kemp 1984). Although the Hudson Bay Company opened a store at Clyde River in 1923, it was not until 1960 that one was opened at Broughton Island. The advent of the trapping era had a profound affect on the Inuit social and settlement patterns. Because trapping was more effectively conducted by small groups over a wide geographic area, not only were the traditional large population groups and associated social and economic patterns disrupted but productive hunting grounds were passed over in favour of good trapping areas which led to subsistence difficulties.

MILITARY DEFENSE SYSTEM

The earliest air defense radar stations were constructed along the eastern and western Canadian coasts in 1942 as a precaution against German and Japanese air attack. At the conclusion of these hostilities, the stations were dismantled. It was not until 1947 that technology became sufficiently sophisticated to warrant and permit construction of a long range radar facility system against a manned bomber attack. This system, the Pinetree Line stretching from Vancouver to Labrador, was completed in 1954 as a joint venture between the Canadian and American governments. It was followed in 1953 by the all Canadian Mid-Canada Line. In November of 1954 plans were finalized for the construction of Distant Early Warning (DEW) Line stations. These were completed in 1957. With the development of intercontinental and submarine launched missiles, the utility of all three systems diminished. As a result, the Mid-Canada Line was phased out in 1965. By 1983, 21 DEW Line stations and 24 Pinetree stations were still in operation.

CAPE CHRISTIAN LORAN STATION

In 1953 an agreement was reached between Canada and the United States for the installation of a LORAN (Long Range Navigation) radar station at Cape Christian to support ocean navigation and aircraft operating out of Thule, Greenland (Claxton 2006). Canada provided right of entry and the facility was built and manned by the U.S. Coast Guard. As part of the conditions, plan drawings for facility structures and disposition of refuse and sewage were to be submitted for approval by the Canadian government (Lexum 1999). Although primary construction did not commence until 1954, some preparatory work was completed in 1953. The station was to continue operations for approximately 10 years but should the installation be deemed unnecessary it was to be decommissioned in one year. Another condition specified that archaeological or historical items on Baffin Island were not to be moved off site. The station was closed in 1974.

METHODOLOGY

INTRODUCTION

In order to meet the objectives of the heritage resources program, the following tasks were conducted: 1) site file search, 2) limited literature review, 3) completion of a field assessment at the location and 4) analysis of the acquired data. At the time of the application for the archaeological permit, letters also were sent to the Regional Land Manager of the Qikiqtani Inuit Association (Iqaluit), the Kitikmeot Heritage Society and the Clyde River Hunters and Trappers Association advising them of the study and requesting information on past use of the Cape Christian area. An environmental monitor (John Angutituak) who lives at Clyde River was on site and provided information on aspects of past and current use.

RECORD REVIEW

Archaeological site records for the general project area (1:250,000 NTS map sheet) were obtained through the Nunavut Department of Culture, Language, Elders & Youth. This data was reviewed to determine the number and nature of previously recorded archaeological and historic sites in the region in which the remediation project is located.

LITERATURE REVIEW

A limited literature review was completed to provide the archaeological and historical context for currently unrecorded archaeological and historical remains and to determine whether significant and/or sensitive historical sites are present in the project area. Primarily NTS maps were examined to provide information regarding terrain features in the project area. The site file search, literature review, and the map data provided some information on archaeological and historic potential of the terrain features associated with the Cape Christian project area.

FIELD STUDIES

The general approach to the field program was to examine all areas of past disturbance and areas of potential disturbance associated with remediation (Earth Tech 2002). Specific attention was given to the previously recorded site, OdDm 1, near the main facility. In addition, coastal and drainage edges, and beach ridges/edges were examined for cultural materials. Potential borrow areas coinciding with the main station area on the ridge, water storage embankment and gravel mound near the runway were examined. Less intensive inspection was given to bedrock outcroppings and areas not identified for remediation activities.

The area examined extended from the drainage to the southwest of the Hazmat building and vehicle dump, north along the beach and associated ridge to the airfield and main facilities area. After a thorough examination of the main station area, a survey of the beach, antenna platform, terrace and tundra extending north past the seasonal drainage to the knoll overlooking Davis Strait was completed (Figure 4).

The specific field methodology consisted of foot traverse of each of the existing facilities and activity areas. All exposures were intensively examined. Because exposures were abundant in all of the activity areas examined, shovel testing was not implemented.

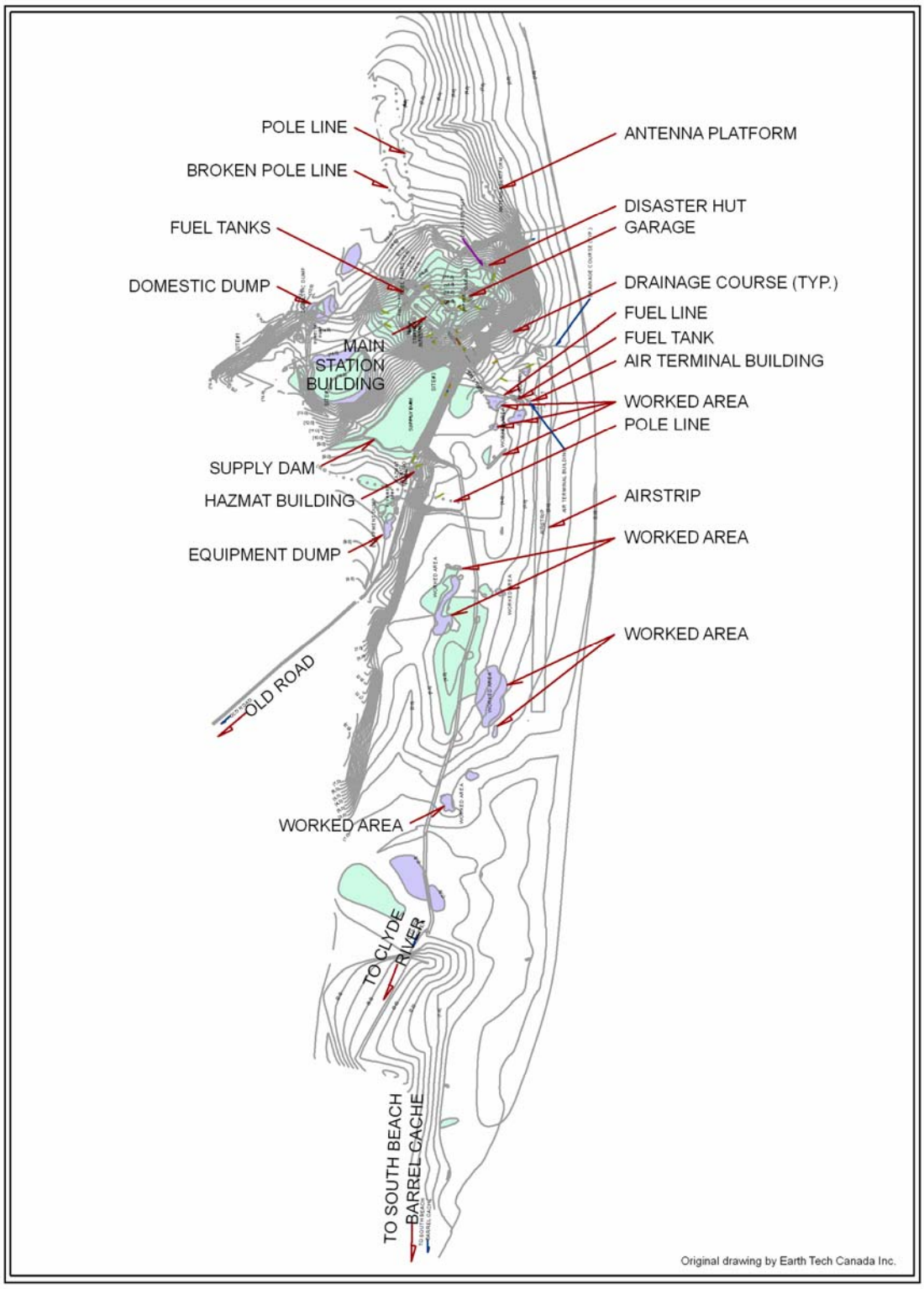

Figure 4 LORAN station, Cape Christian, site layout and facilities

EXISTING DATA BASE

SITE FILE SEARCH

A file search for previously recorded sites occurring on 1:50,000 NTS map sheet 27F/9 (Cape Christian) was completed. Twenty-eight sites are on record for this map sheet; all in coastline locations. Of these, almost 43% are located on Clyde Inlet. An additional 14% are specifically associated with Patricia Bay; one site (3.6%) is located at Cape Christian; 25% are located on Eglinton Fjord, 7% on Inuggsuin Fjord and the remaining 7% are located on islands. Of the total number of sites, the majority of sites (75%) are identified as Thule. Sites reported as PreDorset/Dorset constitute 14%, and the remaining sites were identified as Arctic Small Tool (3.5%), historic (3.5%) and unknown (3.5%). Site contents consist primarily of house remains (42.8%), houses and rings (25%), rings (25%), and artifact scatters (7%).

PREVIOUS STUDIES

The majority of sites in the region were recorded as part of the Thule Conservation Project directed by Allen P. McCartney and undertaken in 1975. Site OdDm 1, located at Cape Christian, was recorded by A. Morgan in 1973 at which time a small collection was made. It was revisited relative to the LORAN station environmental assessment (DIAND 2001) but no permit report (Permit 92-743) is available (Prower, 2006 personal communication). At that time, precontact materials and at least one feature in the area of the station

were observed. Additional artifacts, including a potential fragment of Thule pottery, were identified in the eroded ridges to the southeast fronting the beach. Twenty-six artifacts were collected from eight localities which were all assigned to PreDorset/Dorset cultural affiliation. Although the preliminary design report (PWGSC 2001) states that eight archaeological sites were recorded by Avati-Norcal in 1992, there is only one site, OdDm 1 with eight collection localities, associated with the Cape Christian station.

IDENTIFIED ABORIGINAL LAND USE PATTERNS

Central and southern Baffin Island are occupied by the Baffinland Eskimo. Some of the earliest detailed descriptions of the local populations were made by Boas (1885, 1888). Based on Kemp (1984), the following land use pattern represents early historic activities and provide insights into archaeological and historical potential of various terrain features and localities.

Residing on the south and east coast of Baffin Island were the Nunatsiaqmiut, 'people of the beautiful land' or Baffinland Eskimo (Kemp 1984: 475). Both inland terrestrial and freshwater as well as coastal resources formed part of their economic pattern. Many of the groups journeyed into the interior highlands to hunt caribou and seal in the large lakes. However, groups residing in the regions of deep fjords and mountain valleys were restrained from this pattern by the difficulties in accessing the interior areas.

In early spring, surface ice sealing with harpoons formed the focus of economic activities supplemented by ice floe edge harpoon hunting for seals (primarily the ringed seal), beluga whales and walrus. By late summer caribou hunting was conducted in the interior near Amadjuak Lake. Two age-related patterns are evident at this time. Young hunters and their families moved inland via established routes to focus on caribou hunting while older men and their families hunted marine animals on the coast. Caribou were hunted by bow and arrow from blinds and speared from kayaks as they forded the local rivers and lakes. Other subsistence items consisted of fish, ducks and geese, roots and plants as well as clams and mussels. Seal skin, less commonly caribou or walrus skin, tents were used for shelter.

In the early fall, stone weirs were constructed to take arctic char whereas by late fall, economic attention turned to whale and walrus. Fall was the most important season for harvesting beluga, narwhal and walrus as they fed near the shoreline during migration. The optimum areas for hunting both of these mammals were narrow straits and peninsulas where they were hunted along floe edges from kayak. With decreasing temperatures, breathing hole and floe edge hunting gradually formed the dominant subsistence activities. Winter dwellings often consisted of modified snow houses in which snow blocks formed the basis of the structure and skins formed the roofing. When convenient, Thule stone houses were reoccupied, using skins and sod for roof covering.

FIELD RESULTS

CAPE CHRISTIAN LORAN STATION

The former LORAN Station at Cape Christian is located on a beach ridge with extensions down to the beach along Davis Strait (Figure 3). The main facility is located on top of the oval ridge where the module train, garage, disaster hut, fuel tanks, and domestic dump are located (Plates 9, 10). A road extends from the main facility down to the lower bench on the south and continues on to Clyde River (Plate 11). The road runs along the top of the dam that provided the water supply (Plate 12). This water supply backs onto the ridge. Adjacent to the water supply is the Hazmat Building and an equipment dump (Plates 13). Between the dam and Davis Strait are the remains of an airstrip with an air terminal building, fuel tanks and fuel line (Plate 14).

A highly dissected lower beach ridge fronts the coast line to the north. A roadway from the main facility to the beach transects this feature (Plate 15). The antenna platform lies between the road and the drainage channel (Plate 16).

Plate 9 View northwest at module train.

Plate 10 View southwest at main facility fuel tanks.

Plate 11 View southeast at bridge associated with road from LORAN station to Clyde River.

Plate 12 View southwest along road atop water supply dam.

Plate 13 View east at Hazmat Building; note equipment dump on right.

Plate 14 View west at dismantled air terminal building, fuel tank and fuel line.

Plate 15 Upper roadway from main facility to beach. General view southwest.

Plate 16 Antenna platform north of main station facilities. General view northeast.

ARCHAEOLOGICAL SITES

One previously recorded site was revisited and reassessed relative to remediation of the Cape Christian LORAN station.

Site OdDm 1 (Plates 17 to 24; Figure 5)

Site OdDm 1 was recorded in 1973 by A. Morgan. It was revisited in 1992 by Avati-Norcal as part of the remediation environmental studies. The description of the site states that it consists of *eight areas of prehistoric cultural material* that extend in a northerly direction encompassing the length along the top of a topographic ridge (PWGSC 2001). These artifact concentrations are, in fact, associated with localities where the protective moss and soil layers that cover the ridge have been removed through natural or artificial processes leaving the cultural material exposed (Plate 17). The proximity of the exposed artifact concentrations indicate that OdDm 1 is one large site rather than eight smaller ones.

Evaluation. The most southerly of the exposed cultural areas in the site occurs adjacent to the base of the knoll on which the flagpoles are located (Plate 18). Located on a slightly raised area, the presence of concentrations of disarticulated seal bone and lithic debitage were noted (Plate 19). Although Avati-Norcal stated that *the location of stones and certain depressions showed that these two flagpoles have been placed on at least one prehistoric house structure,* at the time of the 2006 assessment, there was no evidence of house structures at this location.

In exposed ridge areas further to the north, numerous finished tools and lithic debitage were noted. In addition, a whale rib fragment was noted protruding from the moss layer just south of the point where the beach access roadway bisects the site (Plate 20).

In total, 124 lithic artifacts were collected including end blades, side blades, microblades, scrapers, flakes, flake fragments and lithic shatter (Plates 21 through 24). The material types from which these artifacts were constructed include quartzite, chert, quartz, and silicified siltstone. The tools and tool fragments represent 15 per cent (N = 19) of the total artifact count. Two white quartzite end blades and a white quartz end blade perform were collected. all of these artifacts are less than 2.5 centimeters in length. Two side blades were collected, one of which was fashioned from light grey quartz while the others was made of light grey quartzite. Both artifacts are less than five centimeters long.

Three microblades and a microblade fragment were recovered. These artifacts were made from banded chert, dark grey chert or light grey chalcedony. All are less than five centimeters long with two specimens being less than 2.5 centimeters long.

Three end scrapers, an exhausted scraper and a scraper fragment were also collected. The end scrapers and scraper fragment were all made from clear quartz whereas the exhausted scraper was fashioned from white chert. All of these artifacts are less than 2.5 centimeter long.

Four additional artifacts also represent tools. These include an unidentified tool fragment made of white quartzite which is less than 2.5 centimeters long, a black chert bipolar core less than five centimeters in length, a light grey chert core less than 2.5 centimeters long and a light grey chert core fragment less than 2.5 centimeters long.

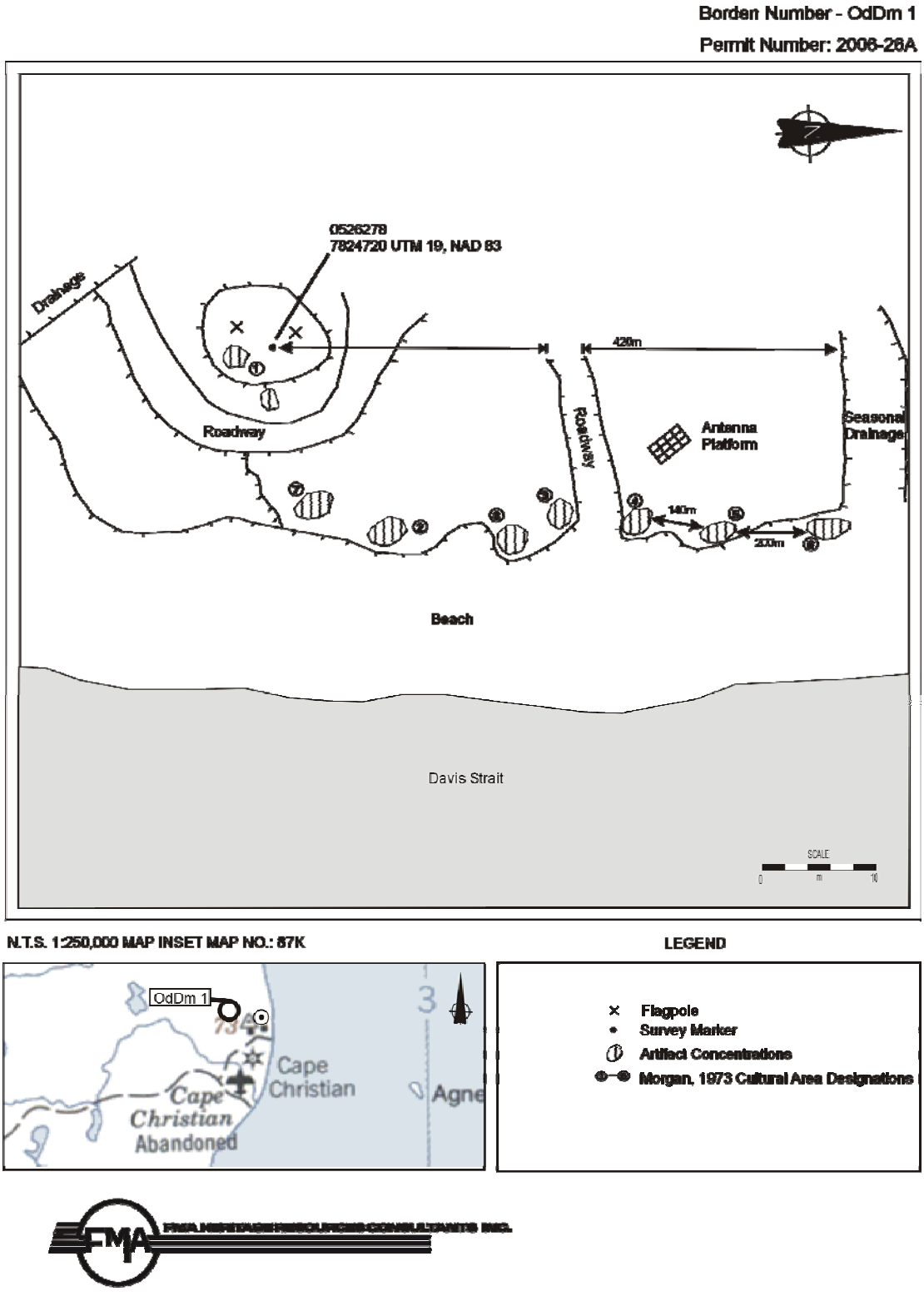

Figure 5 Sketch map of archaeological site OdDm 1

Plate 17 View northwest at exposed area associated with OdDm 1 artifact concentration.

Plate 18 View southwest at flagpoles and site OdDm 1 artifact concentration.

Plate 19 View northwest at seal bone scatter associated with OdDm 1.

Plate 20 View northwest at whale rib fragment associated with site OdDm 1.

Plate 21 View of dorsal and ventral surface of blades collected at OdDm 1.

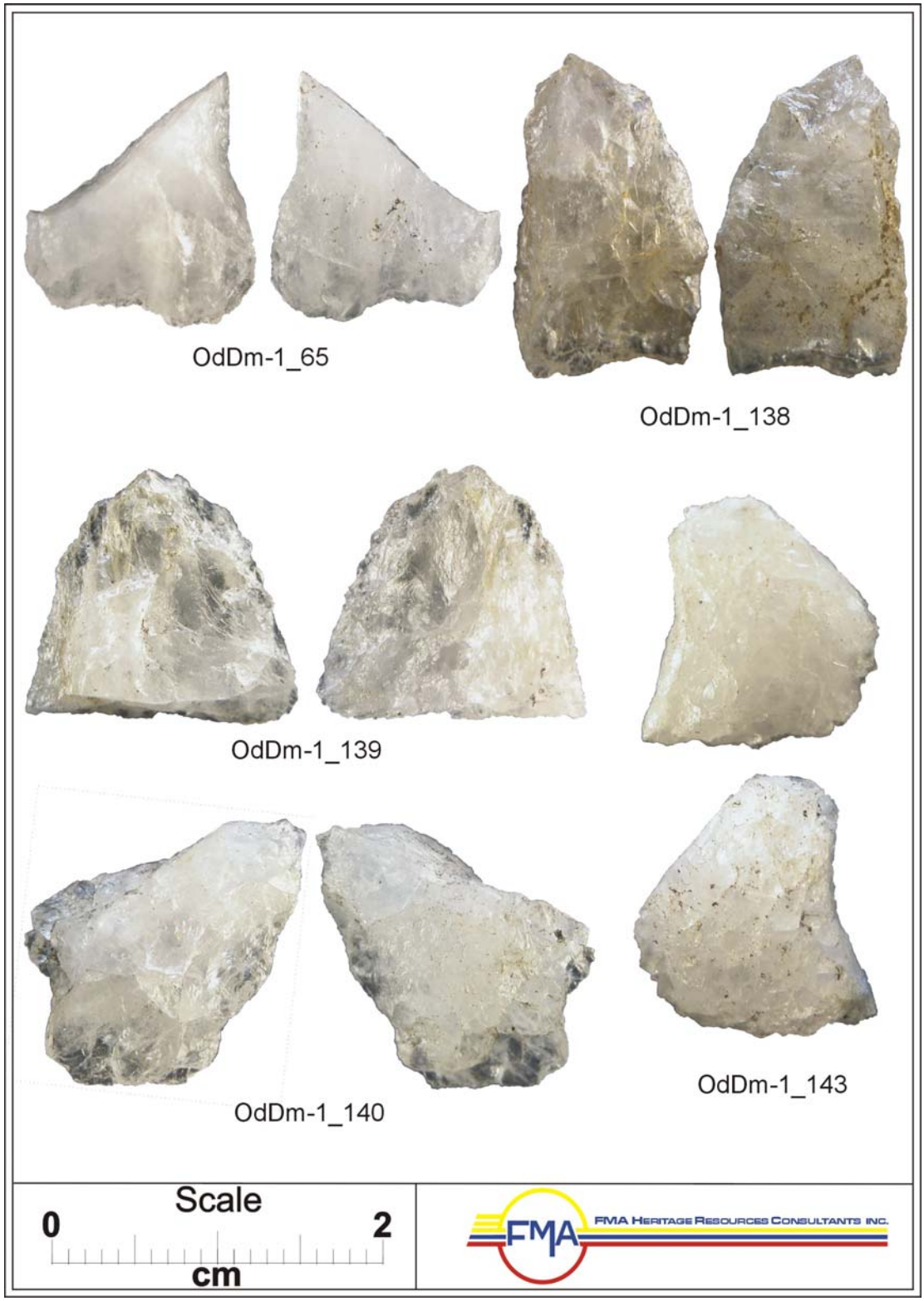

Plate 22 View of dorsal and ventral surface of retouched flakes collected at OdDm 1.

Plate 23 View of dorsal and ventral surface of microblades collected at OdDm 1.

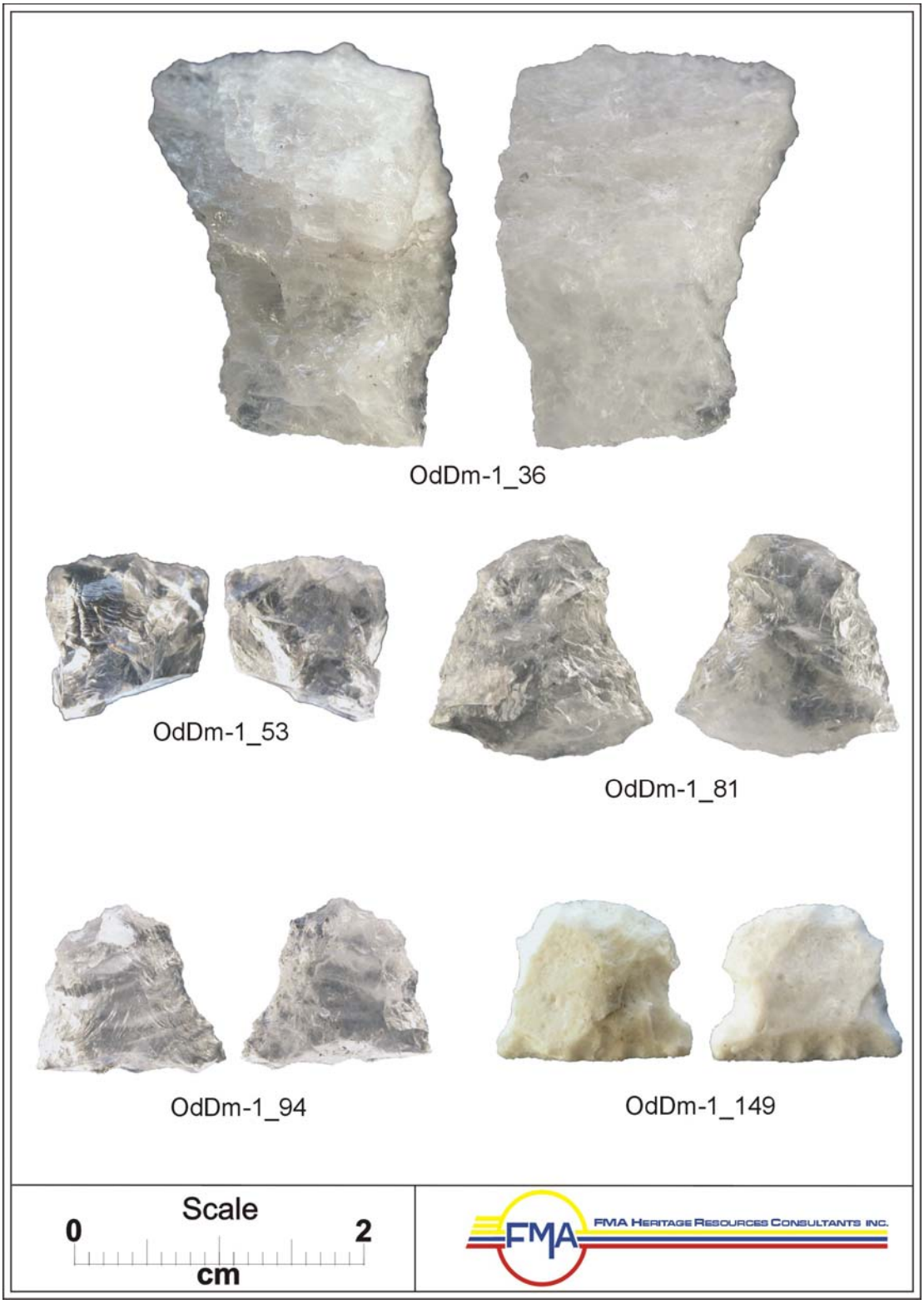

Plate 24 View of dorsal and ventral surface of scrapers collected at OdDm 1.

The flakes and flake fragments represent 64% (N = 79) of the total lithics recovered. The flake types include two bifacial reduction flakes, four primary decortication flakes, five retouched flakes, seven tertiary flakes, two spalls and six flakes of unidentifiable type. The material types include white and clear quartz, grey pebble, banded and mottled chert, light grey quartzite, and black and grey silicified siltstone. All of the flakes are less than five centimeters in length. Of the 48 flake fragments, the dominant material type is white quartz (N = 21), the remainder of the fragments are grey chert (N = 9), light grey quartzite (N = 6), clear quartz (N = 5), white chert (N = 2), grey/brown chalcedony (N = 1), black chert (N = 1), amber quartz (N = 1), red silicified mudstone (N = 1) and black silicified siltstone (N = 1). All of the flake fragments are less than five centimeters in length. Twelve per cent of the flakes and flake fragments exhibit cortical surface.

Shatter accounts for 22% (N = 29) of the total lithic artifact count. The material types include white quartz (N = 11), light grey quartzite (N = 9), clear quartz (N = 5) black silicified siltstone (N = 2), grey quartz (N = 1), and white quartzite (N = 1). All of the pieces are less than five centimeters long. Nine per cent of the shatter displayed cortex.

Although Avati-Norcal described the physical condition of this site as extremely poor due to the erosional processes affecting the site, areas of intact soils were observed between the exposed artifact concentrations during this assessment. Based on the undisturbed vegetation and soils, there is a good likelihood that artifacts and possibly features are still present in their undisturbed primary context across the site area.

The artifact sample correlates well with the cultural materials collected by both Morgan (1973) and Avati-Norcal and supports their conclusion that this site has a PreDorset/Dorset cultural affiliation. The faunal materials and the reported house structures suggest winter/spring occupation. This season, because of intensive localized occupation and use, is generally associated with large numbers of artifacts and features which are important to archaeological reconstructions of technological assemblages, subsistence patterning, and cultural development Of additional interest is an artifact collected by Avati-Norcal and tentatively identified as a piece of Thule pottery. While no further examples of this artifact type were recovered in 2006, the presence of Thule ceramics at this eastern locality is very unique and expands the cultural significance of the site substantially.

Recommendations. It is strongly recommended that all traffic and remediation activities avoid the site area. In the event that avoidance is not feasible further study is recommended. Because of the good potential for undisturbed artifacts and features in the site area and the high likelihood of disturbance during remediation activities, it is recommended that mitigative excavations be undertaken in these areas. Of particular concern are remediation activities that would involve removal of the flag poles and the antenna platform as both of these areas are associated with undisturbed soil and cultural deposits. Similarly, potential features incorporating both fireplaces and bone materials were observed east of the flag pole locality. Mitigation of these features is also recommended prior to any further remediation work. Depending on the final remediation plan, detailed site mapping may also be warranted.

SUMMARY AND RECOMMENDATIONS

An archaeological resources impact assessment was completed of the former U.S. Coast Guard LORAN Station, Cape Christian, Nunavut. A site file search of the corresponding 1:50,000 NTS map sheet was completed to determine the nature and location of previously recorded sites in the region. The field study focused on areas of existing and proposed disturbances in area of the station facilities.

Occupation and use of the station has resulted in extensive disturbance in the site area. This shoreline location was disturbed by grading and other vehicular traffic relating to airstrip development, maintenance and use. Existing borrow areas have been largely disturbed surficially by grading; areas of additional borrow activity will not impact previously undisturbed areas. The remaining areas surrounding the station, supply dam and roads area all associated with disturbances. Domestic and equipment dumps are extensive.

No new archaeological or historic sites were identified during the field reconnaissance in the areas of proposed activities. However, a revisit and re-evaluation of OdDm 1 was conducted. It is recommended that all traffic and remediation activities avoid the site area. In the event that avoidance is not feasible, further study is recommended. Of particular concern are remediation activities that would involve removal of the flag poles and the

antenna platform as disturbance of soils in these areas would impact intact archaeological remains Depending on the final remediation plan, detailed site mapping may also be warranted.

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