

ARCHAEOLOGICAL OVERVIEW

Amaruq Exploration Road

Introduction
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Studies conducted in 2005 (Prager 2006) focused on assessment of the proposed all-weather road between the hamlet of Baker Lake and the Meadowbank Mine. During that study, a total of 28 archaeological sites were newly recorded, and an additional 32 localities containing features were noted; these latter localities were not recorded as archaeological sites either due to the perceived recent nature of the sites, or if they were observed only from the air.

The 2005 assessment of the all-weather road was not considered complete due to issues with coordinates of the road right-of-way and difficulties in obtaining access. As such, there was a need to undertake a second assessment in 2006 (Tischer 2007) to ensure that all areas proposed for impact were adequately assessed, and to determine the relationship between any identified sites and the all-weather road. During the 2006 field studies, 24 previously recorded sites were revisited and 47 sites were newly recorded along the proposed all-weather road and the associated borrow sources. Two new sites were also recorded under the same archaeological permit during an assessment of 12 proposed borrow sources located east of the Meadowbank Gold Project. As such, the total number of sites investigated during the 2006 studies was 73.

Studies conducted in 2010 included elder interviews, an assessment of the tank farm expansion at Baker Lake, an audit of archaeological sites within proximity of the marshaling area, all-weather road, and the mine, as well as an education program for exploration personnel. During those studies, 102 archaeological sites were investigated, including 79 revisited sites and 23 newly identified sites (Tischer 2010).

The 2011 studies were conducted relative to exploration activities, and included both post-impact assessments of 2010/2011 exploration activities, and pre-impact assessments at potential exploration zones prioritized for assessment by Agnico Eagle (Tischer 2012). No archaeological sites were identified within proximity of any of the existing disturbance areas associated with the winter 2010/2011 exploration program. One new archaeological site (LgLa-20) was identified within one of the 2011/2012 drilling targets, and three sites (LfLa-1, LfLa-7 and LfLa-8) were identified within the Priority 5 area, within which future drilling may take place. A fifth site (LhJx-1) was newly recorded to the north of the Priority 6 study area. Site information was provided to Agnico Eagle to ensure avoidance.

In 2013, an archaeological impact assessment for the Meadowbank Gold Project 2013 IVR (now Amaruq) exploration activities was conducted. The archaeological studies were requested by Agnico Eagle in order to ensure that no archaeological sites would be impacted by the IVR exploration program. The 2013 exploration program was relatively small, consisting of surficial hand exploration, and drilling of five core holes. The archaeological field program included inspection of five proposed drill locations, assessment of the exploration Priority Areas that encompass the drill locations, as well as additional assessment of the terrain surrounding the Priority Areas. No archaeological sites were identified.

In June 2014, an archaeological field assessment was undertaken relative to the 2014 proposed exploratory activities and relative to a proposed winter road extending from Meadowbank Mine to the IVR (now Amaruq) exploration area. During the studies, two archaeological sites were recorded during the assessment of the proposed winter road to the IVR area. Six additional sites

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were recorded relative to proposed 2014 exploration activities. Locational information for these newly recorded sites was provided to Agnico Eagle to ensure avoidance by future exploration activities.

Subsequent to completion of the June 2014 archaeological field studies, an all-weather road to the Amaruq property was proposed instead of a winter road; this new proposed all-weather road is the subject of the current report.

1.3 Objectives

The objectives of the archaeological overview for the Project are to:

- Identify any previously recorded sites on file with the Department of Culture and Heritage that could possibly be impacted by the Project.
- Review the nature and scope of any previous archaeological assessment within proximity of the Project.
- Assess the potential for occurrence of archaeological and historic sites in the Project area.
- Formulate recommendations for archaeological field studies necessary to identify and mitigate potential Project impacts on archaeological sites.

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Environmental Setting
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2.0 Environmental Setting

2.1 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 that 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 and creek margins, 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 that precontact occupants had with the environment, a brief description of the regional and local environments is provided.

2.2 Regional Environment

The Meadowbank Mine is located within the Northern Arctic Ecozone and within the Wager Bay Plateau Ecoregion. Terrain is generally level and low with gently rolling hills interspersed by lakes and drainages. The Project is located approximately 70 km north of the hamlet of Baker Lake.

2.3 Project Environment

This proposed Amaruq Exploration Road lies mainly on land, avoiding lake edges and crossing a number of small and medium-sized drainages. Based on the observations made during the 2014 studies which generally extended across the same area, the terrain through which the all-weather road will extend will include a variety of terrain features, including boulder fields, level elevated landforms, lower terrain associated with lakes and drainages, and glacial features. Water crossings will necessitate the installation of seven culverts and four clear-span bridges. A long, well-defined esker generally runs parallel to the road (to the east of the road) along the northern half of the proposed road; borrow materials will be extracted from a number of areas along this esker as well as several other locations, as illustrated in Appendix A and B.

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Heritage Resources
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3.0 Heritage Resources

3.1 Definition

Heritage resources are identified by the Nunavut Archaeological and Palaeontological Sites Regulations (Nunavut Government 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 composed 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 contemporary 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 a society's 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.

3.2 Nature of Heritage Resources

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.

3.3 Mitigative Options

Adverse primary impacts to heritage resource sites, identified prior to the construction stage of development, can be significantly reduced or eliminated by avoidance or adequate study. Site avoidance can be achieved through alteration of the Project footprint. If avoidance is not feasible, adequate study of archaeological sites generally involves scientific investigations that are designed to systematically explore and reconstruct the activities that are represented at the site. These investigations may involve the systematic collection of surface site materials, detailed mapping, photographic documentation of sites, or the excavation of buried sites. Community consultation regarding heritage sites may also be considered for identified sites.

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3.4 Cultural Context

Early intensive archaeological field study in the interior Canadian Shield focused on the central barren lands and is largely restricted to the work of Noble (1971) with some areally defined surveys by Gordon (1975) and Metcalf (1979). More recently, intensive impact assessment studies of defined project areas have been completed in the interior shield, including Blower (2003), Bussey (1994, 1995, 1997), Fedirchuk (1995, 1996a, 1996b, 2001), Kroker (1996), Novacosky (2008), Tischer (2002, 2007, 2008, 2010) and Unfreed (1997). Regional syntheses have been provided by Gordon (1975), Noble (1977), and Wright (1981). A summary of the chronological framework is presented below.

In the interior, the earliest archaeological materials that occur are collectively referred to as the Northern Plano Tradition. These remains are recognized on the basis of the presence of lenticular Agate Basin and Acasta notched projectile points. Sites of this time period are widely scattered in the barren grounds. In the southern Keewatin District, sites of this time period are associated with major caribou crossings or fisheries (Harp 1961). Westward, eskers figure prominently in site association (Noble 1981: 97). The similarity in style to projectile points found further south has prompted the suggestion that people of the northwestern plains seasonally exploited the barrens (Wright 1981: 87). Although the basic economic lifestyle did not change in the succeeding Shield Archaic Period between approximately 4,000 and perhaps 1,000 B.C., lanceolate projectile points continue to serve as horizon markers during this period. Sites of the Shield Archaic occur northward along the Kazan-Dubawnt-Thelon river system. The Shield Archaic is replaced by the Arctic Small Tool Tradition, attributable to Palaeo-Eskimo peoples.

Sometime after approximately 3,500 B.C., Palaeo-Eskimo populations began to take up occupation along the coast of the central Arctic stretching eastward to Greenland. Identifiable on the basis of specialized microlithic and diagnostic standard size tools as well as a variety of bone, antler and ivory materials, these early occupations are assigned to either Pre-Dorset/Independence I (2,200-800 B.C.), a transitional phase, or Dorset (500 B.C. – A.D. 1,450) temporal affiliations (Maxwell 1984). Early, Palaeo-Eskimo sites occur at Dismal Lake (Harp 1958) and Bloody Falls (McGhee 1970). Both sea mammals and terrestrial ungulates (primarily caribou) were exploited; undoubtedly fish and fowl were also included in the subsistence pattern. The succeeding Dorset sites in the eastern and High Arctic suggest an increasing emphasis on sea mammals for winter subsistence and perhaps an increasing use of caribou in summer at inland lakes and of fishing weirs. The final archaeological phase is termed Thule and represented by the 'typical Eskimo' sites in the arctic (McGhee 1984). Thought to have developed in northern Alaska, it rapidly spread eastward to Greenland after approximately A.D. 1,000. Characteristic of Thule culture was a dependence on whale hunting, supplemented by seal, fish, caribou and fowl, and winter villages consisting of several semi-subterranean houses as well as the appropriate hunting and survival tools and material goods.

The Project area falls within the traditional territory of the Caribou Inuit, which is located west of Hudson's Bay and extends from the tree line to just north of Baker Lake. The Caribou Inuit depended almost entirely on fish and caribou, and rarely visited the coast to hunt seals. According to McGhee (1990), the Thule ancestors of the Caribou Inuit, spreading down the

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coast of Hudson's Bay approximately 1,200 B.C., would have encountered the immense herds of caribou that migrate from the tree line north to the summer calving grounds around Chesterfield Inlet. However, given that the barrenlands were occupied by Chipewyan, the Inuit would not have been able to make much use of the caribou resource. When small pox decimated the Chipewyan populations in the 1780s, the Inuit, who had by now acquired trade goods such as traps and rifles as a result of interaction with the Hudson's Bay Company, were able to move inland and efficiently hunt caribou.

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Methods
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4.0 Methods

In order to meet the objectives of the archaeological overview, the following tasks were conducted: 1) review of the existing archaeological site data base, 2) review of previous archaeological studies within the general Project area, 3) review of topographic maps and satellite imagery to evaluate archaeological potential, and 4) formulation of recommendations relative to historical resources studies needed to mitigate Project impacts on archaeological sites.

4.1 Record Review

As required by the Department of Culture and Heritage, Government of Nunavut, a site data request was submitted to determine if archaeological sites are on record within proximity of the Project, including submission of a Nunavut site data licence. Staff at Nunavut's Department of Culture and Heritage responded to provide site information for previously recorded archaeological sites identified within the general project area.

In order to facilitate an understanding of the Project area, a limited regional literature review was conducted using relevant, available resources in order to provide regional context.

4.2 Review of Previous Studies

In addition to requesting recorded site data from the Department of Culture and Heritage, Government of Nunavut, the results of the 2014 archaeological studies conducted relative to the 2014 exploration activities (which were conducted by the author) were reviewed and included in the desktop assessment. These studies were reviewed relative to field study coverage, as well as relative to identified archaeological sites.

4.3 Review of Maps and Imagery

Topographic maps and satellite imagery for the project area were reviewed to identify areas with archaeological potential. Certain terrain features are known to be of higher likelihood to contain archaeological sites because they offer a safe and/or comfortable habitation area, views of the surrounding terrain which allows observation of animals and other humans, and proximity to resources bases such as water, food, building material, fuel, or lithic materials. As such, topographic maps can provide information regarding the presence and nature of terrain features such as eskers, hills and knolls, lakes, creeks/rivers and narrows/rapids. The Project is illustrated on topographic maps in Appendix A.

Although useful, topographic maps can only provide general information regarding archaeological potential of an area. Because of the level of detail of topographic maps, smaller features that may have been attractive to precontact and historic inhabitants may not be discernible on topographic maps. Examples include small better drained areas that could have served as travel areas or habitation areas within larger areas of low potential, which may not be visible on topographic scale maps.

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As a second resource, satellite imagery provided by Agnico Eagle was also reviewed in order to assess the archaeological potential of the terrain through which the road extends; see Appendix B. Satellite imagery of barrenland terrain allows for the identification of more varied changes in terrain, drainage and vegetation regimes. Smaller landforms that may possess greater archaeological potential can be identified; directly relevant to the current project, identification of glacial deposits associated with the esker feature east of the Project are more easily discerned in the satellite imagery than in the topographic maps.

4.4 Formulation of Recommendations

Based on the review of known site locations and site types, the limited literature review, and a review of relevant maps and imagery, recommendations were formulated to identify and mitigate impacts to archaeological sites, including the high level selection of proposed field study target areas.

4.5 Site Designation

Archaeological sites are referred to by a Borden Number which consists of a four letter symbol accompanied by a number (i.e., LdNs-11). This uniform site designation scheme for archaeological sites in Canada was developed by archaeologist Charles Borden (1954). Within this system and north of latitude 62°, the upper case letters represent major blocks 2° by 4° in size (i.e., L = 64° to 66° latitude; N = 104° to 112° longitude) and the lower case letters denote 10' and 20' units within the major block (i.e. d = 30' to 40' latitude; s = 0' to 20' longitude). The numbers are assigned sequentially by the Archaeological Survey of Canada, Canadian Museum of Civilization and refer to specific sites within each unit.

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Results
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5.0 Results

5.1 Record Review

The site file search obtained from the Nunavut Department of Culture and Heritage confirmed that seven archaeological sites are on record within proximity (within approximately 3 kilometres) of the Project area, consisting of six archaeological sites recorded during the June 2014 archaeological impact assessment for the proposed 2014 drilling program and proposed winter road (Tischer 2014), and one site recorded during the 2011 archaeological assessment (Tischer 2011). The site file search confirmed that no new sites had been recorded in the Project area subsequent to the June 2014 archaeological field studies.

The seven archaeological sites on record within close proximity of the Project includes six stone feature sites and one precontact artifact find. The stone feature sites are each represented by between one and nine features; some of these sites appear to be historic or possibly contemporary in age, whereas some sites appear to be of greater antiquity. Stone features identified include stone circles, collapsed inuksuit, hearths, blinds, possible traps and/or caches and uprights/marker stones. Highly weathered wood pieces were identified at one site. The seventh site is a precontact archaeological site represented by a single surficial artifact find consisting of a burin made of white chert.

Of these seven sites, four are within approximately one km of the proposed Project. Site LiLb-1 (see Appendix B, Map 2) consists of two stone features identified on the southwest edge of a wide, cobbled esker. A circular hearth was observed, as well as a second feature that may represent a collapsed inukshuk. The site does not appear to be of significant antiquity, but likely represents an indigenous historic site. The site is approximately 700 metres from the Project.

Site LhLb-2 (see Appendix B, Map 9) is a stone feature site that consists of nine stone features situated on a prominent bedrock landform overlooking the Meadowbank River to the south; at this location, the river is very wide and is effectively a lake. Two possible traps, two possible collapsed inuksuit, a house or blind, and three stone uprights/marker rocks were observed. The site occupies a very prominent location and the uprights would have been visible from a significant distance. Two curved wooden pieces were observed approximately 150 meters to the northeast. The site is approximately 400 metres from the Project. Approximately 200 metres to the east of site LhLb-2, prehistoric site LhLb-3 is located on the same landform just above the start of a narrows of the Meadowbank River. A single stone tool, a burin manufactured from white chert, was recovered and provides evidence of prehistoric occupation of this region. This site is approximately 200 metres from the Project.

Site LgLb-20 (see Appendix B, Map 15) is a stone feature site that consists of a single tent ring situated on a rise in low rocky terrain. The ring is very well defined, and is likely indigenous historic in age. The site is approximately 300 metres from the Project.

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Within the region, a number of archaeological sites have been identified further to the south of the proposed Amaruq Exploration Road. Numerous sites were identified during studies conducted for the Meadowbank Mine and associated components, including the all-weather road from Baker Lake, the tank farm at Baker Lake, and exploration programs. All sites previously recorded in association with the Meadowbank Mine Project were stone features and/or historic in nature. Although some stone feature sites appeared to be of significant antiquity to represent prehistoric period sites, no prehistoric lithic finds (stone tools or debitage) had been recorded relative to Meadowbank Mine components prior to the finding of the burin in 2014.

Other studies conducted in the region, however, have resulted in finds indicating a long period of human occupation in the region. A significant number of sites in the region have been identified along major watercourses such as the Kazan River to the south of Baker Lake and the Thelon River, which is located just to the southwest of the Project. Archaeological sites are common along these major river systems and provide evidence of the long history of occupation of the barrenlands. These major rivers would have served as travel corridors and areas of resource availability. However, the lifeways of prehistoric barrenlands peoples was intimately tied to one main resource, that is the caribou. As such, archaeological sites indicative of land use well away from major rivers are present, and likely relate to life following the caribou. The Meadowbank River, which is crossed by the Project, is located north of the Thelon River, and would have been easily reached from this major drainage by following a series of lakes and drainages; the close proximity of this major river, which could have served as a means of accessing boreal resources periodically, such as wood, increases the archaeological potential of the region. The Meadowbank River itself would be a source of resources, including fish and caribou at narrows, and could have served as a travel route between the Thelon River, Baker Lake, and the north.

5.2 Review of Previous Studies

The archaeological field studies conducted in June 2014 for the exploration program and the proposed winter access road were conducted within the general Project general area. Because the 2014 proposed winter road was intended for winter use only, much of the proposed right-of-way (90%) was on water; as such, only the on-land portion was assessed to identify archaeological sites.

During the June 2014 assessment of the proposed winter road, helicopter overflight of the entire proposed winter road was conducted to identify areas with the potential to contain archaeological sites. Two areas that generally overlap with the currently proposed Amaruq Exploration Road were observed during this helicopter overflight. The first area consists of the north end of the proposed Amaruq Exploration Road, immediately south of the Amaruq property, which was visually observed during helicopter overflight only, and which was observed to be of low to moderate archaeological potential. The second location that has been directly observed is a watercourse crossing; see Map 11 (Appendix A and B) and Plate 5-1. Because the 2014 proposed winter road was on the water in this location, no ground truthing was conducted, but the proposed Amaruq Exploration Road right-of-way in this location is of moderate archaeological potential.

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Plate 5-1 View north along 2014 proposed winter road, which ran north-south along the watercourse. The proposed Amaruq Exploration Road will cross the lake in the foreground at the narrowest point as illustrated (see Map 11).

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In addition, some of the proposed drilling areas assessed in the general Amaruq area during the June 2014 archaeological field studies included some areas within proximity of the proposed Amaruq Exploration Road. On Map 9, Appendix A and B, the area south of the proposed crossing of the narrows was assessed briefly to record an archaeological site (LhLb-2) which had been observed from a distance. The area along the north shore of the river/lake was traversed at the location of sites LhLb-2 and LhLb-3, and the elevated landform on the opposite side of the narrows was also briefly visited.

To the north of this, the landform that can be observed lying between the two proposed Amaruq Exploration Road routing options on the west side of the narrows was also visited; see photos 5-2 and 5-3. Further north, both sides of the narrows (to the northeast of where the proposed route turns west) were examined for archaeological sites in 2014. No archaeological sites were identified in these areas.

Although there is no direct overlap of these 2014 ground assessed areas and the proposed Amaruq Exploration Road footprint, the proximity of these field visits to the proposed road footprint provides some idea of the terrain features and archaeological potential of the proposed road.

5.3 Review of Maps and Imagery

Based on a review of topographic maps and satellite imagery, the Project crosses through a number of areas with moderate to high potential to contain archaeological sites, including the following:

- Areas adjacent to creeks, rivers, and lakes, as these provide sources of water to human groups, sources of water for animals that can be subsequently hunted by humans, and provide other food resources such as fish (particularly along narrows/rapids). In addition, these areas also potentially provide other resources such as fuel (for example brush for fire).
- Elevated, well-drained areas that could present good habitation sites, such as knolls, hills and eskers. These elevated locations are windier, meaning fewer bugs are present, and also provide good views of the surrounding terrain to allow for the observation of other humans and animals. Such exposed areas may be more likely to contain summer sites than winter sites, given that shelter may be more desirable than exposed areas in the winter months.
- Areas that represent travel routes, such as eskers, which are well-drained and easy to walk along, often for great distances, and river systems, such as the Meadowbank River.
- Areas that provide a source of lithic (stone tool) material, such as eskers, kames and other glacial features. These landforms would have been visited to acquire lithic materials to manufacture stone tools; as such, because of this resource and the ease at which one can travel on an esker, these landforms are almost always considered to be of highest archaeological potential.
- Locations adjacent to previously recorded sites; the presence of known archaeological sites indicates that human populations were using an area, and as such, areas in the vicinity of known archaeological sites are of high archaeological potential themselves.

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Areas with moderate archaeological potential may demonstrate or contain some of the features listed above, in lesser degrees or in fewer combinations of the above listed criteria. Areas considered to have low archaeological potential include areas that are poorly drained, that have inhospitable terrain (such as boulder fields), and areas exhibiting featureless terrain, as these areas would not have drawn human groups the same way as the terrain features listed above. Note, however, that low potential is not 'no' potential; archaeological sites are identified regularly in areas that are of 'low' potential, due to additional factors unrelated to terrain features. However, sites are less commonly encountered in low potential areas than in moderate or high potential areas.