ARCHAEOLOGICAL IMPACT ASSESSMENT
Mackenzie Valley Highway Prospective Borrows

Northwest Territories Class 2 Archaeology Permit
Number: 2021-022
Sahtu Settlement Area

Final Report

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Prepared for:
Department of Infrastructure, Government of the Northwest Territories
Yellowknife NT

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K'alo-Stantec

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Executive Summary

At the request of the Government of the Northwest Territories, Department of Infrastructure, K'alo-Stantec conducted an Archaeological Impact Assessment on seven proposed quarries or borrow sources (and/or their associated access routes) associated with the proposed upgrading of the existing Mackenzie Valley Winter Road into an all-season road (the Mackenzie Valley Highway Project). The proposed Mackenzie Valley Highway Project will extend the Mackenzie Highway (Northwest Territories Highway #1) from Hodgson Creek (located approximately 1 km north of Wrigley) to Prohibition Creek (located approximately 28 km southeast of Norman Wells). The portion addressed under the current study includes only the activities planned within the Sahtu Settlement Area. This includes the stretch between approximately Mackenzie Valley Winter Road km point 813 and km point 990, or roughly halfway between Wrigley and Tulita to halfway between Tulita and Norman Wells. The Archaeological Impact Assessment was conducted under Northwest Territories Class 2 Archaeology Permit 2021-022.

The scope of work within the Archaeological Impact Assessment was agreed to by the Culture and Heritage Department of Education, Culture, and Employment during the permit application process, and was based on the 2021 Archaeological Overview Assessment of a wider selection of prospective bedrock quarries and granular borrow sources along the full length of the Mackenzie Valley Highway Extension Project.

Within the seven proposed quarries or borrow sources, including their access corridors (as applicable), addressed by the current study, a total of 24 high potential areas were identified as part of an Archaeological Overview Assessment. These are tabulated in the summary table below.

The fieldwork was completed between September 27 and October 2, 2021. The fieldwork was completed by a field crew consisting of two K'alo-Stantec archaeologists and two local community members from Tulita, Stephanie McCauley and Jonathan Yakeleya, as coordinated by Tamara Bernarde-Baton of the Tulita Renewable Resources Council. The assessment consisted of combined helicopter and ground survey, supplemented by shovel testing in areas with high archaeological potential and minimal surface exposure, as outlined in the summary table below.

During the study, 116 shovel tests were excavated, all of which were negative for cultural materials. No archaeological sites were newly recorded, although previously recorded historic campsite LgRr-1 was revisited and evaluated. No traditional land use sites were recorded. Shovel tests were excavated at the following areas:

- Three shovel test areas in Prospect 7.083
- Two shovel test areas on access to Prospect 7.083
- One shovel test area on access to Prospect 7.109
- One shovel test area in Prospect 9.002

Location	# of High Potential Areas	Assessment Method	Recommendations
Prospect 7.083 and associated access	6	Helicopter overflight Ground survey Shovel testing	No further study recommended for prospect or access
Prospect 7.090	1	Helicopter overflight Ground survey	No further study recommended
Prospect 7.109 and associated access	5	Helicopter overflight Ground survey Shovel testing (access only)	Conduct ground survey and shovel testing of outstanding shovel testing areas in prospect; no further study recommended for access
Prospect 8.039 and associated access	4	Helicopter overflight	Conduct ground survey and shovel testing of high potential area in prospect; no further study recommended for access
Prospect 9.002	2	Helicopter overflight Ground survey Shovel testing	No further study recommended
Access to Prospect 9.019	2	Helicopter overflight Ground survey (partial)	No further study recommended
Prospect 9.025B and associated access	4	Helicopter overflight Ground survey (partial)	Conduct ground survey and shovel testing of high potential area in prospect; no further study recommended for access

Due to field access and weather conditions, it was not possible to complete the ground assessment at three of the investigated areas, including prospects 7.109, 8.039, and 9.025B. However, all three were subject to either partial ground survey or helicopter overflight. As a result of this assessment, it was possible to identify six shovel test areas in Prospect 7.109, and to modify the high potential areas in prospects 8.039 and 9.025B. The access corridors for these three locations were evaluated, including subsurface testing in the access to Prospect 7.109 and helicopter overflights or ground survey of the other two, and no further study is recommended for the planned routes as illustrated herein. Based on the results of the assessment, no further study is recommended at prospects 7.083, 7.090, 9.002, or, including their associated access, and in the access to Prospect 9.019, as illustrated herein.

Table of Contents

List of Tables

List of Figures

List of Photos

Credit Sheet

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1 INTRODUCTION

The Government of Northwest Territories (GNWT), Department of Infrastructure (INF), contracted K'alo-Stantec Consulting Limited (K'alo-Stantec) to complete an Archaeological Impact Assessment (AIA) for prospective quarry and borrow activities (the Project) associated with the proposed upgrading of the existing Mackenzie Valley Winter Road (MVWR) into an all-season road (the Mackenzie Valley Highway Project). The proposed Mackenzie Valley Highway Project will extend the Mackenzie Highway (Northwest Territories Highway #1) from Hodgson Creek (located approximately 1 km north of Wrigley) to Prohibition Creek (located approximately 28 km southeast of Norman Wells). The portion addressed under the current study includes only the activities planned within the Sahtu Settlement Area (SSA). This includes the stretch between approximately MVWR km point 813 and km point 990, or roughly halfway between Wrigley and Tulita to halfway between Tulita and Norman Wells (Figure 1-1). The AIA was conducted under Northwest Territories Class 2 Archaeology Permit 2021-022.

Prior to initiation of ground reconnaissance, the Project was evaluated relative to impacts to archaeological resources through a desktop Archaeological Overview Assessment (AOA) (Peach 2021), submitted to the territorial heritage regulatory agency (Culture and Heritage Division of the Department of Education, Culture, and Employment [Culture and Heritage]). The AOA study area was broad and inclusive, evaluating a total of 39 proposed locations, including areas identified in the borrow source evaluation as "primary" and "secondary," and as "bedrock quarry" and "granular source" prospects. As defined in the K'alo-Stantec Field Reconnaissance Plan (K'alo-Stantec 2020a), primary sources are those considered to have the greatest potential for future development, and which, accordingly, are recommended for geotechnical field reconnaissance. Quarry sources imply an open excavation related to the extraction of bedrock, while granular sources involve the extraction of unconsolidated granular (non-bedrock) materials (K'alo-Stantec 2020b). Those prospects identified as "primary" were the first priority for archaeological investigation as well. Seven prospective quarries/borrows and/or their associated access routes were selected for investigation under the current permit, including:

- Bedrock quarry Prospect 7.083 and associated access, at approximately MVWR km point 990
- Bedrock quarry Prospect 7.090, at approximately MVWR km point 975
- Bedrock quarry Prospect 7.109 and associated access, at approximately MVWR km point 962
- Bedrock quarry Prospect 8.039 and associated access, at approximately MVWR km point 867
- Granular borrow source Prospect 9.002, at approximately MVWR km point 851
- Access to bedrock quarry Prospect 9.019, at approximately MVWR km point 822
- Bedrock quarry Prospect 9.025B and associated access, at approximately MVWR km point 813

Figure 1-1 Location of Project

A total of 24 high potential areas (HPAs) were identified through completion of the AOA within these seven prospects and/or their associated access corridors. All were evaluated during the course of the AIA. Fieldwork for the project was based out of Norman Wells, and was conducted from September 27 through October 2, 2021. The fieldwork was completed by a field crew consisting of two K'alo-Stantec archaeologists and two local community members from Tulita.The area assessed during this study is located within the traditional territories of the Sahtu Dene and Métis First Nations. Prior to the onset of field activities, K'alo-Stantec contacted individual groups located near the proposed development. Tamara Bernarde-Baton of Tulita Renewable Resources Council arranged for Tulita community members Stephanie McCauley and Jonathan Yakeleya to aid in the completion of the fieldwork.

1.1 LEGISLATIVE REFERENCES

The Northwest Territories Archaeological Sites Regulations (GNWT 2014a), pursuant to the *Archaeological Sites Act* (GNWT 2014b), include legislation regarding the management and protection of NWT archaeological resources. This legislation applies to archaeological and historical remains that are older than 50 years, for which "an unbroken chain of possession cannot be demonstrated" and located on public or private land. Archaeological sites are protected from unpermitted disturbances, alterations or surveys under the *Archaeological Sites Act.*

The Sahtu Land Use Plan (SLUPB 2013) applies to Sahtu Settlement Area lands. Conformity Requirement Number Four (CR# 4) of the Sahtu Land Use Plan includes provisions related to archaeological resources:

1. Land use activities must not be located within 500 m of known or suspected burial sites, or within 150 m of known or suspected archaeological sites, unless measures are developed in cooperation with Culture and Heritage, affected communities, or in the case of burial sites, with affected families where possible, to fully mitigate all impacts to the site.

2. In areas where there is a high risk of impact to known or suspected archaeological sites, as determined by the Culture and Heritage, an archaeological impact assessment must be conducted prior to commencement of the land use activity.

The Sahtu Land Use Plan (SLUPB 2013) applies to SSA lands as identified in the Sahtu Dene and Métis Land Claim. Known or suspected archaeological sites as outlined in the plan are interpreted as "archaeological sites registered in the NWT Archaeological Sites Database, or identified by the Prince of Wales Northern Heritage Centre during the project review, or identified by community members during public engagement and through traditional knowledge" (SLUPB 2013:38).

Section 4 of the Mackenzie Valley Land Use Regulations, pursuant to the *Mackenzie Valley Resource Management Act* (Government of Canada 1998) contains regulations that prohibit unpermitted land-use operations within 30 m of a known or suspected historical or archaeological site or burial site and require

the suspension of all operations if an archaeological site or burial is discovered. The Mackenzie Valley Land Use Regulations apply to all lands in the NWT outside of the Inuvialuit Settlement Region.

1.2 OBJECTIVES

The primary objectives of an AIA are to:

1. identify archaeological sites within the Project footprint
2. assess the nature of Project impacts on identified sites relative to site heritage value and to potential impacts
3. formulate recommendations for further site management

1.3 SCOPE OF WORK

The scope of work for an AIA consists of the following components:

1. **Record Review** - to identify previously recorded sites that could be affected by the Project and to determine the nature of the database in the area.
2. **Ground Reconnaissance** - to relocate, in the field, archaeological sites that may have been previously recorded, as well as to identify and record any new sites within the Project footprint.
3. **Site Evaluation** - to evaluate the nature of the existing resource database, the quantity and quality of observable remains (*e.g.* site condition, content, uniqueness, and complexity) and the potential of the site to contribute to the regional database.
4. **Impact Assessment** - to assess the potential for impacts to the identified archaeological sites, as well as the local and regional database, and to recommend site specific mitigative measures commensurate with the assigned value of the site.

2 BACKGROUND

This section provides an overview of the Project location, including a description of the environmental, ethnographic, and historic background of the Project area, as well as an overview of previous archaeological work completed within the general vicinity of the Project.

2.1 PROJECT LOCATION

The proposed development is located southeast of the town of Norman Wells along the existing MVWR. Portions of seven prospective quarry or borrow sources, and/or their associated access routes, all located within the SSA, were targeted for assessment. Three are situated between Norman Wells and Tulita (Prospects 7.083, 7.090, and 7.109), and the other four are all south of Tulita (Prospects 8.039, 9.002, 9.019, and 9.025B). With respect to access routes, a 60 m wide evaluation area was considered, to permit future minor adjustments.

2.2 ENVIRONMENTAL SETTING

Environment has always provided the parameters within which human cultures may develop by providing both opportunities and limitations. As a result, elements of the regional environment are important considerations in the understanding of cultural development, as they influenced not only the types of activities that could be conducted, but the ways in which they could be accomplished. In the archaeological record, this pattern is observed in the type and location of archaeological sites found in specific environments. In the Northwest Territories, archaeological sites are commonly found associated with a specific set of landforms (including eskers, valley edges, knolls, rivers, lakes, coastlines, and channels) which would direct travel, bias routes of communication, and enhance or restrict resource procurement and occupation. Due to this close relationship of human settlement and the environment, a brief overview of the regional and local environments is presented.

2.3 REGIONAL ENVIRONMENT

The Project is located within the Taiga Plains Ecoregion and the Taiga Cordillera Ecoregion, both of which are Level II subdivisions of the Level I Taiga Ecoregion and Level I Cordillera Ecoregion (Figure 2-1). Each can be further subdivided into four and five distinct Level III ecoregions, respectively, based on differences in climatic regime. The proposed quarries and borrows evaluated under the current Permit fall within the Level III Taiga Plains Low Subarctic (LS) Ecoregion (of the Level II Taiga Plains Ecoregion) and the Level III Low Subarctic Ecoregion (of the Level II Taiga Cordillera Ecoregion). The portions in the Level III Taiga Plains LS Ecoregion can be further subdivided into the Level IV North

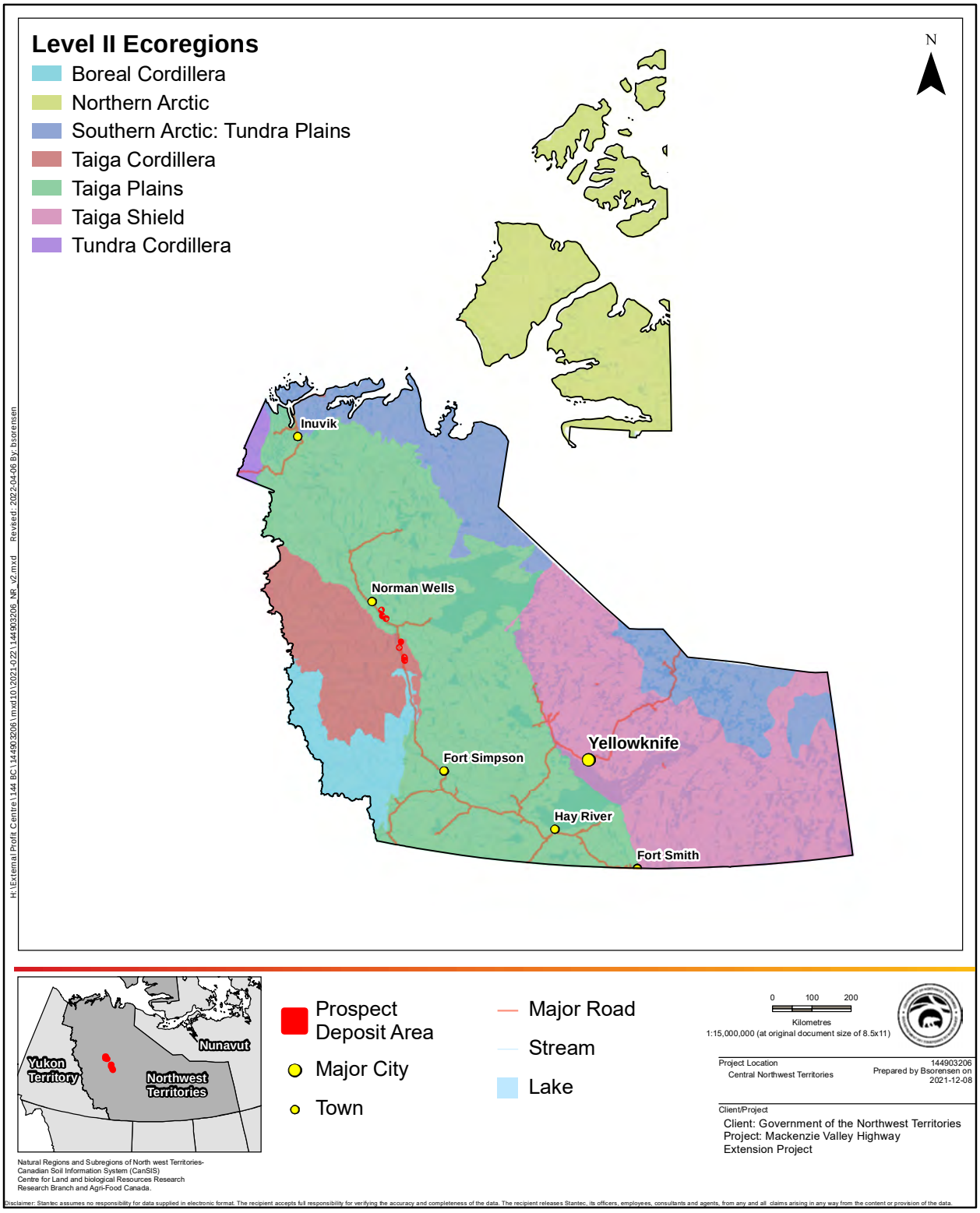

Figure 2-1 Ecological Regions of the Northwest Territories

Mackenzie Plain LS and Norman Range LS Ecoregions, while the Level III Low Subarctic Ecoregion section is in the Level IV Central Mackenzie Plain Ecoregion (Ecosystem Classification Group 2009, 2010).

The Level III Taiga Plains LS Ecoregion mainly comprises the central third of the Level II Taiga Plains Ecoregion. Extensive low-lying plains, uplands, and hill systems with level to very gentle slopes characterize the ecoregion, with extensive peatlands and low-canopied open black or white spruce forests. The Level IV North Mackenzie Plain LS Ecoregion parallels the Mackenzie River for over 300 km. This Ecoregion is dominated by till deposits, with significant areas of lacustrine, fluvial, and glacio-fluvial materials. Fluvial or glacio-fluvial terraces parallel the Mackenzie River and its major tributaries while lacustrine plains occupy narrow, discontinuous bands along the river in the central portion of the Ecoregion and undulating to hummocky till veneers and blankets cover upland areas. The majority of the till uplands have been burned in the recent past, resulting in large areas covered with dwarf birch, green alder and Alaska paper birch shrublands, or regenerating mixed black and white spruce and Alaska paper birch communities. Remnant white spruce and spruce-birch forests occur along rivers, on alluvial and lacustrine plains, and around lakes. On unburned till uplands, mixed open white and black spruce stands with shrub, moss, and lichen understories are common. Peat plateaus are scattered throughout (Ecosystem Classification Group 2009).

The Level IV Norman Range LS Ecoregion is mostly situated between the lower North Mackenzie Plain LS Ecoregion and the Great Bear Upland LS Ecoregion. It is characterized by a complex mix of steep-sided bedrock ridges, bedrock plains, deeply incised glacial meltwater channels, and dissected plateaus. Bedrock is dominated by dolomites and limestones of Cambrian to Devonian age, with till veneers and blankets covering much of the lower-lying areas. Lacustrine and glacio-fluvial deposits are more common in the northwest between ridges, while thin organic deposits have developed in valley floors and occasionally on slopes. Much of the ecoregion was affected by forest fires in the recent past, resulting in large areas covered with regenerating stands of Alaska paper birch and dwarf birch. Remnant black and white spruce stands are better developed and more common in the western part of the ecoregion, with understories dominated by various mosses and lichens. Rare jack pine stands can be found in the southern extent of the ecoregion. Major named water bodies include Turton, Kelly, Chick, Moon, and Oscar Lakes, with horizontal fens and channel marshes in the areas between. The slopes are drained by unnamed intermittent streams (Ecosystem Classification Group 2009).

The Level III Low Subarctic Ecoregion comprises most of the central third of the Level II Taiga Cordillera Ecoregion, as well as a narrow band along the foothills of the Canyon and Shattered Ranges. The Level IV Central Mackenzie Plain Ecoregion occupies a portion of the broad valley between the Mackenzie Foothills and the Franklin Mountains. Terrain is largely level to gently sloping, dominated by lacustrine plains and alluvial and glaciofluvial terraces paralleling the Mackenzie River. Major named watercourses include the Keele, Redstone, Blackwater, and Dahadinni Rivers, while named water bodies include Mio and Eentsaytoo Lakes. Forests are largely comprised of black spruce woodlands, while white spruce and paper birch can be found on alluvial deposits and steeper terrain. Sparse stands of jack pine and

trembling aspen are generally found on better-drained soils to the southern part of the ecoregion. Extensive recent fires have impacted much of the area, and regrowth is characterized by shrubby and deciduous communities (Ecosystem Classification Group 2010).

2.4 PROJECT ENVIRONMENT

The landscape within each prospect and/or their associated access routes generally ranges from gently sloping to undulating terrain to dramatic upland ridges and terraces. Shovel test areas (STAs) were generally situated on moderately to well-defined terrace edges near to creek edges or overlooking water bodies. The environmental setting observed for each of the prospects and/or their associated access routes is described in detail below. The location of the targeted prospects is illustrated in Appendix A.

2.4.1 Prospect 7.083

The most northerly of the proposed developments investigated during the 2021 field season, Prospect 7.083 is a potential bedrock quarry site located near to MVWR km point 990, approximately halfway between Tulita and Norman Wells. This area represents a proposed expansion from an existing bedrock quarry (Prohibition Creek Quarry). Terrain within the prospect footprint is characterized by an extremely high, prominent northwest-southeast trending ridge that drops sharply on the northeast side down to a small, unnamed lake (Plate 2-1). Most of the ridge is very narrow, with a level crest measuring only between 5 m and 10 m in width before sloping steadily down to the southwest (Plate 2-2). Generally, this side of the landform descends at an increasingly sharp angle down to its base, outside of the proposed footprint. A small, relatively level bench was observed near the western edge of the landform, with a clear viewshed across the broader Mackenzie River valley. Vegetation throughout is dominated by regrowth of black spruce, complemented by a well-developed understory variously dominated by Labrador tea and caribou lichen. The ridge crest is an active animal trail, and there is evidence of relatively recent human occupation in the form of several cut tree stumps (Plate 2-3). Soils encountered during shovel testing generally encountered basal gravels or decaying bedrock at a fairly shallow depth, between 10 cm and 40 cm below surface (B.S.). They were typically poorly drained and dominated by silty clay with sparse to abundant pebble and cobble sized clasts, usually increasing in frequency with greater depth (Plate 2-4).

The planned access route for Prospect 7.083 measures approximately 7.8 km and follows an existing trail that leads from the MVWR to an existing quarry. Most of the length is characterized by gently undulating terrain that trends downwards in elevation nearer to the MVWR (Plate 2-5), generally featureless with the exception of a pair of creek crossings in the southern half with moderately well-defined edges or nearby ridges (Plate 2-6). Additional creek or wetland crossings were observed during the helicopter overflight, but were found to be small and ill-defined, with no high archaeological potential areas in the vicinity. Vegetation in the visited portions, where not previously affected by the existing trail, is largely dominated by black spruce, willow, with caribou lichen and Labrador tea. Shovel tests excavated within the access encountered shallow soils characterized by an unsorted mix of clay, sand, and pebble to cobble-sized clasts with greater abundance at depth (Plate 2-7).

Plate 2-1 View northeast from edge of landform in Prospect 7.083 towards small unnamed lake

Plate 2-2 View southeast showing ridge crest in Prospect 7.083 around STA02

Plate 2-3 Cut stumps providing evidence of recent use of ridge in Prospect 7.083; view southwest within STA04

Plate 2-4 Typical soils encountered on ridge crest in Prospect 7.083; east profile of ST081 in STA04 (scale in 10 cm increments)

Plate 2-5 **Aerial view south along existing trail followed by access to Prospect 7.083, from near existing quarry location; generally featureless terrain**

Plate 2-6 **Aerial view south showing creek crossing (at arrow) on access corridor (in white) to Prospect 7.083; STA01 circled in red**

Plate 2-7 Typical soils encountered on low ridge in access to Prospect 7.083; east profile of ST002 in STA01 (scale in 10 cm increments)

2.4.2 Prospect 7.090

Prospect 7.090 is set on a similarly (relative to 7.083) dramatic, elevated bedrock ridge near to MVWR km point 975 (Plate 2-8). The majority of this landform has been previously assessed, and so only a small portion of the central area was evaluated under the current Permit. This section is characterized by a relatively level area with a steep, cliff-like drop down to a small lake on the northeast side of the larger landform (Plate 2-9). Vegetation in the site area is dominated by regrowth of willow and aspen, along with sparse birch and white spruce. Overgrown push piles are suggestive of past disturbance (Plate 2-10).

2.4.3 Prospect 7.109

Near to Tulita at approximately MVWR km point 962, proposed bedrock quarry site Prospect 7.109 is situated immediately north of Bear Rock on a series of parallel east-west trending bedrock ridges and upland knolls (Plate 2-11). Much of the northeastern part of the prospective quarry is sloped steeply and steadily down to the northeast (Plate 2-12). Most of the ridges are narrow, measuring up to 5 m to 10 m at the crest, and those that reach the western edge of the upland area overlook a pair of small lakes (Plate 2-13). The areas between ridges and knolls are characterized by low, sloped terrain that is heavily vegetated. At the time of the current investigation, the ridge crests were snow-covered, with light vegetation dominated by white spruce and willow. Based on the results of previous investigations in the area, soils are generally shallow, overlying bedrock deposits where the latter is not exposed on the surface (Heffner and Young 2020).

Access to the prospect from the existing MVWR to the south follows a north-south trajectory through largely intact, level terrain (Plate 2-14). It crosses a small, fairly well-defined ridge near the south end, although the planned crossing of the landform is at a lower spot. The proposed access was found to be vegetated by a mix of white and black spruce, tamarack, birch, and willow (Plate 2-15). Shallow soils encountered in shovel tests were clay-dominant, with increasingly abundant pebble and cobble-sized clasts, overlying decaying bedrocks at depths of between 15 cm and 30 cm B.S. (Plate 2-16).

2.4.4 Prospect 8.039

Prospect 8.039 is a planned bedrock quarry location centered around a high upland knoll overlooking an unnamed creek to the northeast, which is a tributary of Big Smith Creek. The proposed quarry could not be accessed during the current assessment due to a lack of helicopter landing areas, but the helicopter overflight showed a gradual, steady slope up towards the height of land from the south, followed by a sharp drop on the north side into a broad, level plain (Plate 2-17). The area is covered by dense pine-dominated regrowth, with abundant deadfall observed during the overflight.

Plate 2-8 View south showing landform targeted by Prospect 7.090 with site LgRr-1 location indicated by arrow

Plate 2-9 View west towards site LgRr-1 area from near edge of landform in Prospect 7.090

Plate 2-10 View west within Prospect 7.090 with push pile (at arrow) showing evidence of disturbance

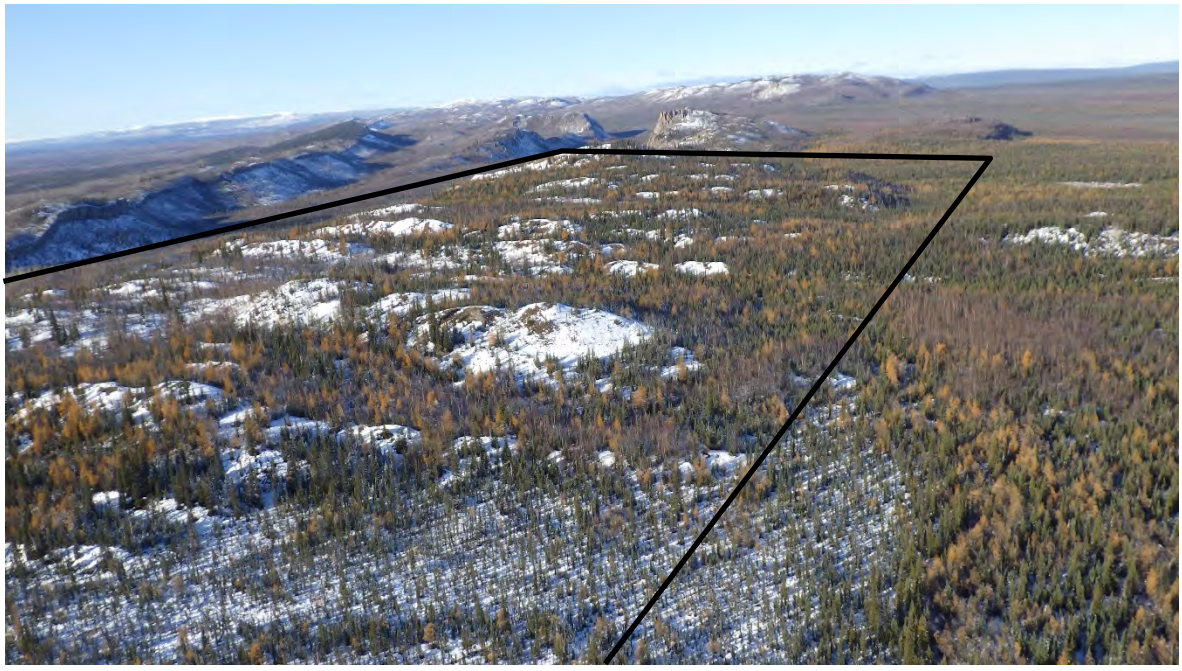

Plate 2-11 Aerial view north showing ridges and knolls in Prospect 7.109 (approximate outline in black)

Plate 2-12 View northeast (from STA05) showing typical terrain in northeast corner of Prospect 7.109

Plate 2-13 View west from end of ridge targeted by STA07 towards small unnamed lake outside Prospect 7.109

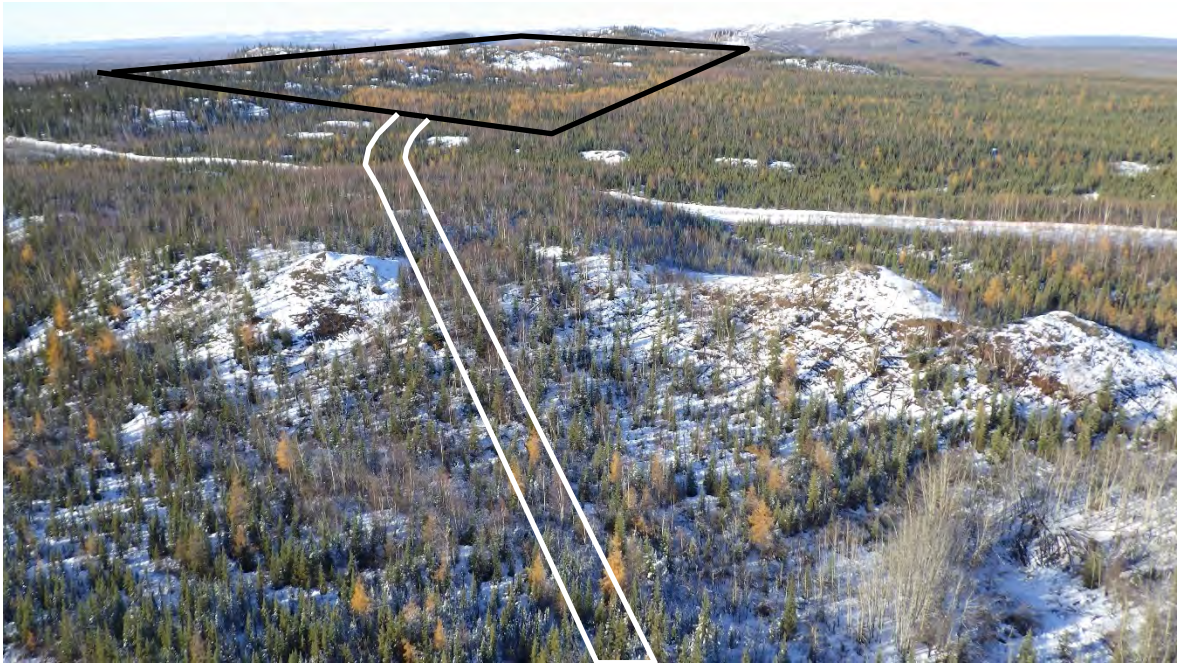

Plate 2-14 View north along approximate planned access (in white) to Prospect 7.109 (in black)

Plate 2-15 View northeast along ridge crossed by access to Prospect 7.109 in area of STA11, showing landform and typical vegetation

Plate 2-16 Typical soils encountered on low ridge crossed by access to Prospect 7.109; east profile of ST039 in STA11 (scale in 10 cm increments)

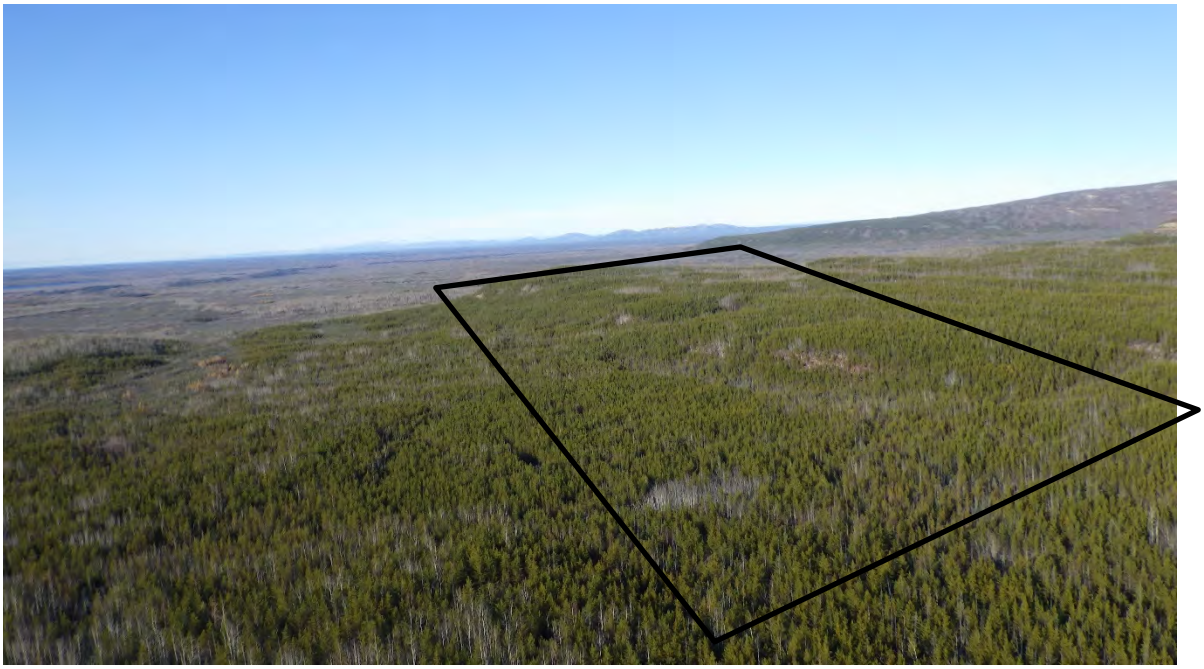

Plate 2-17 Aerial view north showing Prospect 8.039 (in black) with high potential landform at north end

The planned access corridor leading to Prospect 8.039 originates at the MVWR and leads to the southwest corner of the proposed quarry area. The route was assessed by helicopter overflight and found to be gently sloping throughout with some minor undulations (Plate 2-18). No wetlands or watercourses were observed; variations in vegetation observed in satellite imagery appear to represent differential regrowth following forest fires, rather than changes in the terrain.

2.4.5 Prospect 9.002

The majority of planned granular borrow Prospect 9.002, at MVWR km point 851, has been subject to previous impacts related to an existing air strip and seasonal camp, in addition to the current MVWR alignment. Much of the footprint has been previously assessed for archaeological resources. Only a small section at the northeast corner of the prospective borrow source was evaluated under the current permit due to its inclusion in an avoidance area defined by a previous AIA (Krahulic 2019). The area is situated on a broad, fairly level plain on the south side of an unnamed creek near its confluence with Little Smith Creek (Plate 2-19). The creek valley is broad and well-defined (Plate 2-20), and the upper edge is mostly level and open. Large portions of the assessed area, however, were found to be on the downslope segment of the landform, characterized by a gradual, steadily increasing slope without any observed benches or terraces (Plate 2-21). The area was found to have been previously impacted by forest fires, with variable and mixed regrowth dominated by willow, white spruce, aspen, and sparse pine. Shovel tests excavated near a narrow, poorly defined point of land near the northeast corner of the prospect on the upper valley edge encountered an unsorted mix of clay, sand, and pebbles, suggestive of glacial till. The rate of clay and pebbles to small cobbles increased with depth (Plate 2-22).

Access for Prospect 9.002 was not evaluated under the current permit, as it is entirely within previously assessed areas.

2.4.6 Prospect 9.019

Planned bedrock quarry site Prospect 9.019 is located at approximately MVWR km point 822. No areas of high archaeological potential were identified during the AOA (Peach 2021), and so the prospect was not subject to assessment during the AIA.

The proposed access to Prospect 9.019 extends east-northeast from the MVWR to the western edge of the potential footprint. Based on a perceived association with minor drainage channels, two areas of high archaeological potential were identified by the AOA (Peach 2021). The planned access route follows an existing, albeit overgrown, cutline that was visible during the helicopter overflight (Plate 2-23). Also evident from the aerial reconnaissance, however, was that there were no active drainages or creek crossed by the proposed alignment. The terrain generally trends upward to the east as it approaches the

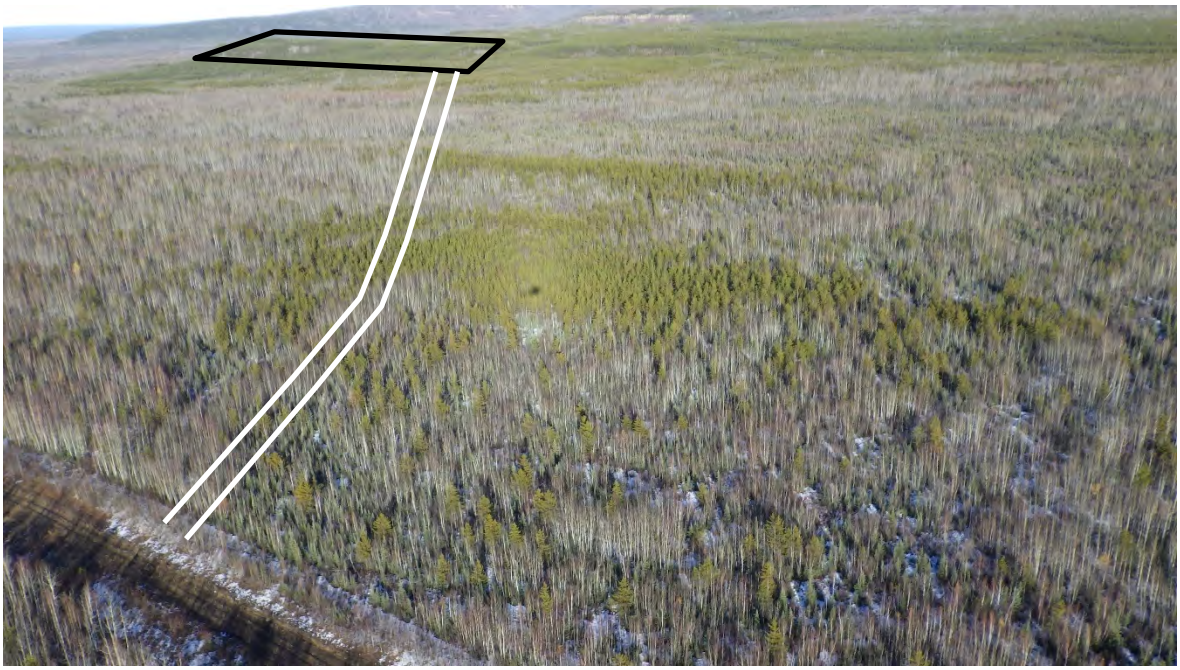

Plate 2-18 Aerial view east along approximate access (in white) to Prospect 8.039 (in black), existing MVWR in foreground

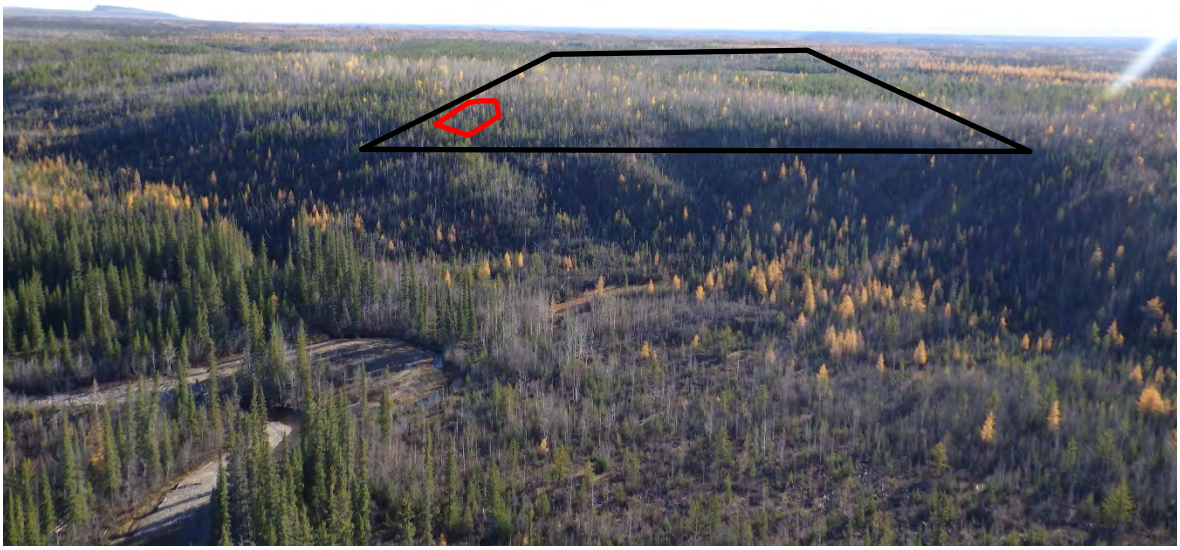

Plate 2-19 Aerial view southeast showing Prospect 9.002 (in black) with STA12 outlined in red

Plate 2-20 View north across unnamed creek valley from edge of Prospect 9.002, near confluence with Little Smith Creek

Plate 2-21 View south up gradual, steady slope characteristic of much of assessed portion of Prospect 9.002, just below STA12

Plate 2-22 Typical soils encountered on upper creek valley edge in Prospect 9.002; southeast profile of ST053 in STA12 (scale in 10 cm increments)

Plate 2-23 Aerial view northeast showing portion of access to Prospect 9.019 that follows old overgrown trail

proposed quarry area, with minor undulations and no well-defined edges. Vegetation regrowth is dominated by a dense mix of tamarack, white spruce, aspen, birch, and willow, while the areas outside of the pre-existing cutline are covered primarily in willow and juvenile spruce (Plate 2-24).

2.4.7 Prospect 9.025B

The most southerly of the potential quarry or borrow sources evaluated during the 2021 field program, Prospect 9.025B is a proposed bedrock quarry near approximately MVWR km point 813. The proposed quarry could not be accessed during the current assessment due to a lack of helicopter landing areas, but the helicopter overflight showed a series of parallel elevated ridges set within an extremely high upland area (Plate 2-25). Areas between the ridges appear to be level and broad, with exceptional views out to the north and west. Although the terrain continues to rise to the east, outside of the quarry footprint, the edges of the landform are dramatic (Plate 2-26). Vegetation is a mix of pine, spruce, and birch.

Three possible high archaeological potential target areas were identified by the AOA (Peach 2021) on the planned access to Prospect 9.025B, all of which were evaluated by helicopter overflight. The terrain was found to be characterized by a long, gradual slope, without well-defined landforms along its 2.4 km length (Plate 2-27). A secondary ground reconnaissance of the two more westerly targets, closest to the existing MVWR, confirmed the absence of high potential landforms (Plate 2-28). Black spruce, paper birch, and willow are dominant, suggestive of poorly drained soils (Plate 2-29). Isolated stands of juvenile aspen are present in the targeted portions of the proposed access.

2.5 ARCHAEOLOGY OVERVIEW

Human activity across the Northwest Territories was traditionally thought to postdate the retreat of the late Pleistocene Ice Sheets and the subsequent drainage of the resulting proglacial Lake McConnell (Johnson 1975). Recent developments, however, would seem to indicate that the reality of regional deglaciation was somewhat more complex and may have involved successive periods during which an ice-free corridor may have opened and then closed (Swisher et al. 2013). In addition, this corridor would have had a complex interaction with glacial meltwater and the subsequent formation and drainage of minor proglacial lakes, further complicating human travel. Nevertheless, it is widely acknowledged that by about 12,000 years before present (B.P.), the Laurentide and Cordilleran Ice Sheets had retreated indefinitely creating an ice-free corridor centered along the Mackenzie River valley and extending south through Alberta along the eastern margin of the Rocky Mountains (Johnson 1975). There is currently no direct archaeological evidence to support human activity within the area of the corridor prior to this period.

At what time people began to move into the area associated with the post-glacial corridor and exactly how this region became populated remains unclear. Early sites in Alberta would seem to indicate that people had moved into the southern portion of the corridor very early (11,000 to 12,000 years B.P.) as evidenced by sites such as the St. Mary's Reservoir and Lake Minnewanka (Kooyman et al. 2001; Landals 2013).

Plate 2-24 View east showing vegetation outside of overgrown trail around access to Prospect 9.019

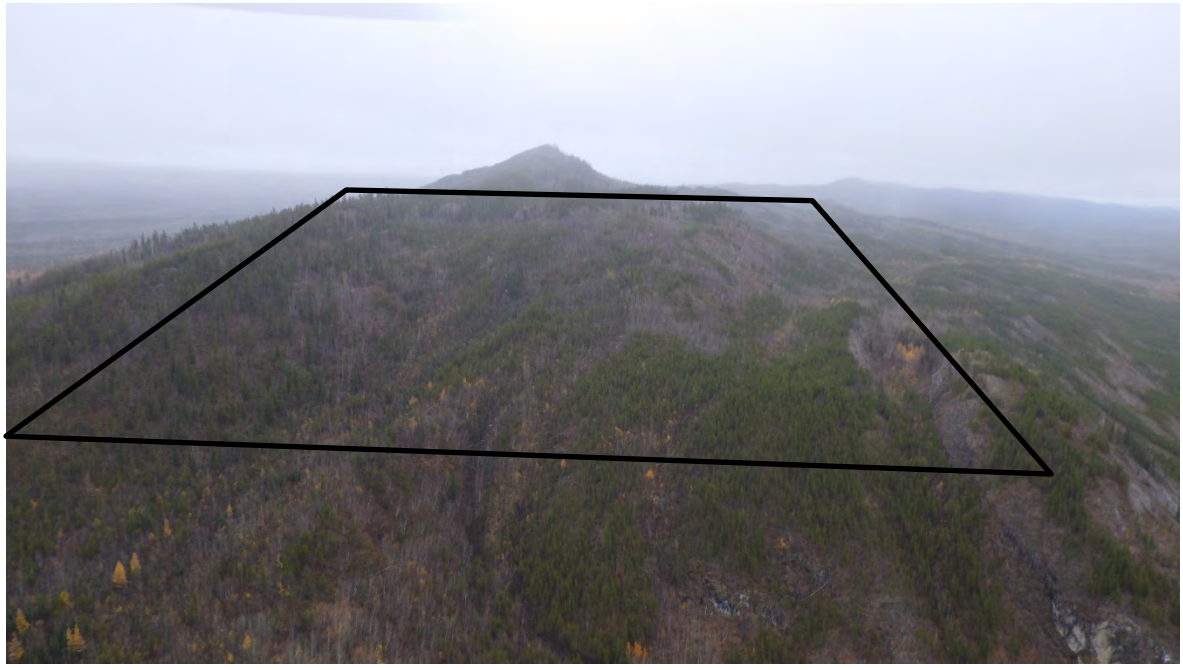

Plate 2-25 Aerial view southeast showing approximate outline of Prospect 9.025B

Plate 2-26 Aerial view west showing Prospect 9.025B

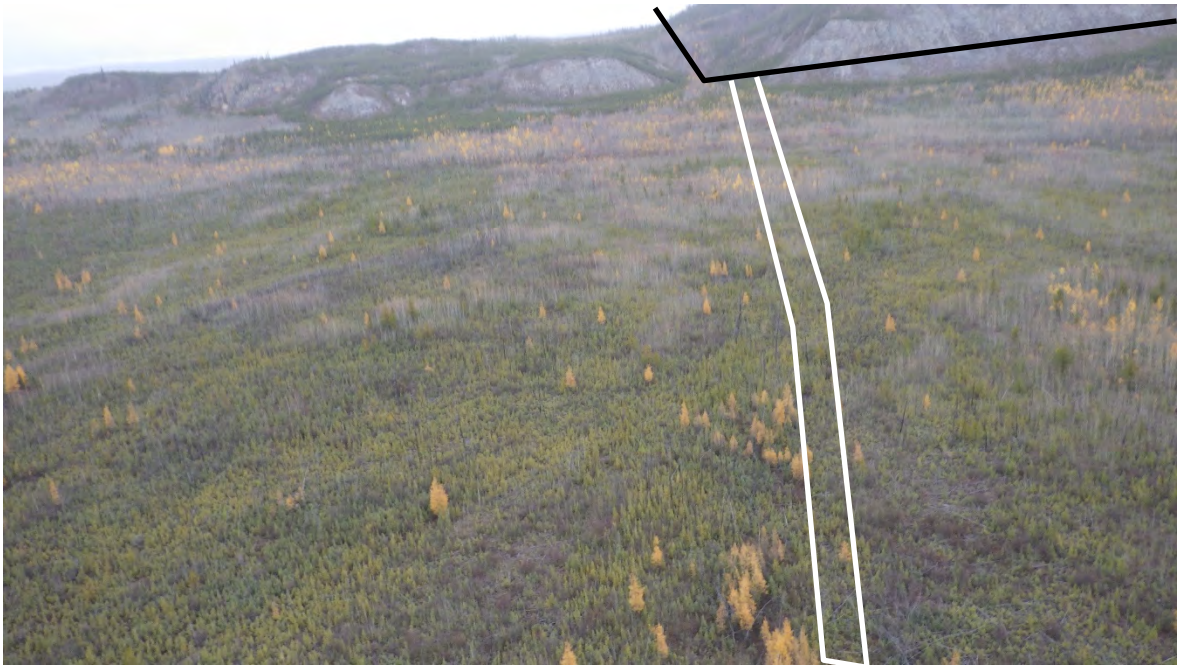

Plate 2-27 Aerial view east along approximate access (in white) to Prospect 9.025B (in black) from about midpoint

Plate 2-28 View northeast showing typical featureless terrain encountered near southwest end of access to Prospect 9.025B in HPA24

Plate 2-29 Typical vegetation encountered in portions of access to Prospect 9.025B suggestive of poorly drained soils; view south near north end of HPA23

Nevertheless, there is little direct evidence to support such early activity in the northern reaches of the corridor. This paucity of activity is noteworthy given the long-held view throughout much of the 20th century that initial movement into the corridor must have occurred from the perennially unglaciated and inhabited adjacent portions of Alaska and the Yukon. It is currently unclear if the initial thrust of human migration into these unglaciated lands was primarily from the north, the south, or some combination thereof.

2.5.1 Precontact Period

The earliest defined culture at the northwestern extremities of North America is that of the Arctic Early Precontact or Palaeoarctic tradition. This tradition has largely been defined on the basis of finds in Alaska and the Yukon and its extension into the Northwest Territories has been widely assumed on the basis of ecological similarity and geographic opportunism, although no archaeological finds yet confirm this (Garbarino and Sasso 1994). Sites associated with the Palaeoarctic tradition are frequently dated to between 11,000 and 8,000 years B.P. with some assemblages dated as recently as 4,500 years B.P. (age being somewhat dependent upon location). Characteristic artifact assemblages include notched burins, microblades and unnotched lanceolate bifaces. Palaeoarctic subsistence is thought to have represented a nomadic hunter-gather lifestyle initially reliant upon terrestrial arctic big game, but which rapidly expanded to include marine mammals and fish.

At the same time, PalaeoIndian cultures were already established across lands adjacent to the south end of the ice-free corridor. Archaeologically, these populations were defined by large fluted lanceolate spear points belonging to the Clovis Complex. Subsistence was typified by a general reliance on big game but was to become increasingly specialized towards bison by about 9,500 B.P. with the appearance of the Western Plano cultures, characterized in the archaeological record by the construction of finely flaked large un-fluted lanceolate and stemmed spear points. It is unclear as to how these Palaeoarctic and more southerly Early Precontact cultures relate to one another, although there has been wide speculation that both groups may have arisen at least in part from an earlier Early Precontact population that had begun to expand out of Beringia by no later than 14,000 years B.P. In any event, it is similarly unclear how either or both of these groups may have contributed to the populating of areas along the Ice-free corridor, particularly at the north end.

The earliest archaeological record of peoples in the Northwest Territories derives from an assemblage recovered at Acasta River (LiPk-1), southeast of present Great Bear Lake. Charred bone fragments from hearths indicated reliance on a mix of animals including barren-ground caribou, black bear, beaver, hare and eagle (Noble 1978). This assemblage was dated to approximately 7,000 years B.P. and included Agate Basin spear points, bipoints, stemmed and un- stemmed lanceolate forms, along with scrapers, gravers, burins, spokeshaves and a possible whetstone (Noble 1978). These finds became the type site for the Acasta Lake complex, defined as part of the Northern Plano tradition and evident from several finds across the Northwest Territories including Chick Lake (LlTa-2) adjacent to the Mackenzie River valley (Millar and Fedirchuk 1974). Northern Plano shares typological and

temporal associations with Western Plano and is widely seen as a Northern expression of the culture with adaptations towards a more northerly subsistence base (Clark 1978).

The Middle Precontact Period (~6,000 to 2,000 years B.P.) in the Western Subarctic is most closely associated with what is believed to be the eastward progression of Palaeoarctic populations. In the Mackenzie basin, this resulted in reciprocal influences with the existing populations, while at the same time, characteristics associated with adjacent Cordilleran populations also began to appear. Microblades are the most distinctive aspect the Arctic Small Tool tradition closely associated with these emergent Palaeoarctic practices, although flake tool burins, notched lanceolate points and stemmed projectile points are also typical (Garbarino and Sasso 1994). Generally, occupations yielding such collections have been assigned to a fairly broad regional and temporal categorization termed as the Northwest Microblade tradition which appears to have been established in the Mackenzie basin by no later than 4,500 years B.P. (Clark 1978). Some key sites with lower components dating to this period include Whirl Lake (MjTp-1, ~4,000 years B.P.) along the lower Mackenzie and the Julian (JcRw-13, ~4,000 years B.P.) and Pointed Mountain (JcRx-2, ~2,500 years B.P.) sites adjacent to the upper Mackenzie (Clark 1978; Gordon and Savage 1974; MacNeish 1954; Morrison 1984).

Around 2,500 years ago, populations associated with the Northwest Microblade tradition appear to leave the Mackenzie basin and move towards the northern coasts where they are eventually replaced by the Thule ancestors of the modern Inuvialuit (Clark 1978). The Late Precontact Period (~2,000 to 200 years B.P.) in the Mackenzie valley begins with the establishment of new populations appearing to derive from the south and/or east (Morrison 1984). They are best represented by a technological complex first defined at the Spence River site (JjRd-2) along Jean Marie River near the upper Mackenzie (Clark 1978). The Spence River complex is notable for a typical absence of microblades, and the inclusion of small triangular and leaf-shaped projectile points (with side or corner notches) that are thought to represent the earliest northern expression of bow and arrow utilization (Morrison 1984). Other characteristic artifacts include small end scrapers and gravers, chi-thos (rounded stone abraders for softening skins) and cobble choppers, and a well-developed technology utilizing bone and antler. Some key occupations associated with the Late Precontact in the Mackenzie valley (1,600 to 200 years B.P.) include: the upper horizons at the Whirl Lake (MjTp-1), Chick Lake (Llta-2), and Pointed Mountain (JcRx-2) sites; as well as the site complex at Fisherman's Lake along the upper Mackenzie (JcRw- 1, 3, 16, 18, 51) which includes the upper components of the Julian (JcRw-13) and McLeod (JcRw-8) sites (Clark 1978; Gordon and Savage 1974; Millar 1968; Morrison 1984).

The origins of the people associated with the Spence River complex are uncertain but show clear affinities with at least two nearby technological traditions. These include the contemporaneous Aishihik phase in the southern Yukon and the Taltheilei Shale tradition originally defined in the Great Slave Lake region and which encompasses adjacent areas in Northern Alberta (Clark 1978; Gordon 1975; Morrison 1984). The Taltheilei tradition is thought to be associated with caribou hunters who followed the herds in the Barrenlands during the spring and summer but wintered in the forests (Gordon 1996). The Taltheilei are widely identified as a proto-Athapaskan population ancestral to modern Dene populations and, given

the close technological associations, it is considered to be likely that the peoples associated with Spence River complex are similarly ancestral to the current Dene populations of the Mackenzie Basin.

2.5.2 Historic Period

The presence of European trade goods in the Indigenous archaeological record is indicative of the Contact Period, during which time direct and indirect contact with Euro-Canadian traders and explorers occurred. Despite considerable disruption to First Nation groups resulting from the fur trade and European settlement of the northwest, many First Nations peoples continued traditional seasonal rounds into the 19th century. Exploration of the Canadian Northwest and contact with the resident native population was a direct result of French-English rivalry to satisfy the demand for beaver pelts for the European market.

In the 18th century, the Hudson's Bay Company initiated exploration along the northern sea lanes and, in 1771, Samuel Hearne undertook the first overland expedition to the arctic coast along the route of Coppermine River, witnessing conflict between local Dene and Inuit populations (Bastedo 2010). In 1789, Alexander Mackenzie, representing the North West Company, canoed the length of what would come to be known as the Mackenzie River from its headwaters at Great Slave Lake to the Delta and back again. This expedition represented the first encounter with many of the Indigenous populations of the Mackenzie basin (Hanks and Winter 1990). In the early 19th century, John Franklin undertook several explorations of the region collecting a vast amount of data regarding local peoples, flora and fauna, and geography until the 1847 disappearance of his final expedition (Arnold 1986; Richardson 1984). Thomas Simpson reached the Great Bear River in 1836 and continued north along the Mackenzie during his search for the Northwest Passage. Franklin's Lieutenant, John Richardson, similarly traversed the Mackenzie River in 1850.

Shortly following Mackenzie's expeditions in 1789, the arrival of the fur trade was heralded by the establishment of several trading posts along the course of the river and its tributaries. Around 1795, the first such post was established at the mouth of the Trout River along the upper Mackenzie, although it was subsequently moved to the confluence with the Liard River in 1802 (Heine et al. 2007). Around 1805, Mackenzie's nephew established the first post along the lower Mackenzie at the mouth of the Bluefish River that was to eventually be moved adjacent to the mouth of the Thunder River and renamed Fort Good Hope (Auld and Kershaw 2005). In 1827, the post moved back upriver and, in 1839, relocated to the current position of the Fort Good Hope settlement in response to flooding (Bastedo 2010; Heine et al. 2007). Other important posts established along the Mackenzie River include Fort of the Forks (Fort Simpson) around 1803, Fort Norman (Tulita) between 1805 and 1810 (briefly relocated to Old Fort Point) and a fort established at Old Fort Island in 1870, that was subsequently moved in 1905, to what is now Old Town in Wrigley (Auld and Kershaw 2005; Bastedo 2010; Heine et al. 2007). Between the mid-19th and 20th centuries, several small transient posts were also established across the region by independent traders including along the upper Mackenzie, at the mouth of the Travaillant River and at several locations throughout the Delta (Auld and Kershaw 2005; Blondin 1997; Heine et al. 2007).

Shortly after the establishment of the fur trade, missionaries began to arrive throughout the Mackenzie Basin. In 1859, Oblate Father Henri Grollier established a Roman Catholic Mission at Fort Good Hope (Auld and Kershaw 2005). He was followed by Oblate Father Émile Petitot who constructed the landmark Our Lady of Fort Good Hope Church between 1865 and 1885 (Bastedo 2010). An Anglican mission was established at Fort Simpson in 1858, followed by a Roman Catholic Mission in 1894 (Bastedo 2010). The Roman Catholics founded a mission in Tulita in 1859 and were followed one year later by the Anglicans who eventually built a small log church which still stands as a historical landmark (Bastedo 2010). Another Roman Catholic Mission was established by Oblate Father Jean Séguin at Arctic Red River (Tsiigehtchic) in 1868 (Bastedo 2010; Heine et al. 2007).

The various posts and missions were initially serviced by fleets of York boats that were stored at the posts through the winter (Blondin 1997; Heine et al. 2007). Following break-up, the boats would travel to Fort Smith and Fort Chipewyan servicing various communities during the trips to and fro. The York boats were hand-rowed and, where necessary, portaged overland (Blondin 1997; Heine et al. 2007). In 1887, steamboats were introduced and became the primary means of shipment. The vessels required huge sums of cord wood and countless wood camps sprang up along the banks of the Mackenzie to service the ships in transit. The camps employed large numbers of local Dene (Blondin 1997; Heine et al. 2007).

In 1903, the North West Mounted Police (NWMP) began to establish a presence throughout the Mackenzie valley and Delta region. Their activities included regulation of the various forts and travel corridors and were designed in part to project the authority of the Canadian government across northern lands (Heine et al. 2007). In several cases, local Dene were made special constables and assisted with the day-to-day tasks of the force (Heine et al. 2007). The initial move north by the NWMP had begun largely as a response to the Yukon Gold Rush of the 1890s and the subsequent influx of American miners and resulting growth in the liquor trade (Heine et al. 2007). The settlement of Little Chicago was founded along the banks of the Mackenzie north of Fort Good Hope by Chicago area prospectors en route to the Yukon (Bastedo 2010). Interest by the Canadian government in the Mackenzie valley region increased in 1921 with the discovery of significant oil deposits in what is now known as Norman Wells (Blondin 1997).

The area witnessed a pulse of activity with discovery of oil at Norman Wells in 1920 under the supervision of Ted Link from Imperial Oil Company (Barry 1998). The discovery stemmed from early reports of petroleum that included Alexander Mackenzie`s notes from July 24, 1798, as well as reports from fur traders who used local seeps for caulking their boats. Claims around oil seeps on the Mackenzie River were staked as early as 1911 but drilling began in earnest when Imperial Oil purchased claims near Norman Wells in 1919. Upon discovery of a productive well, a small refinery was built at Norman Wells that operated for only a few years due to a lack of a ready market. Discovery of radium coupled with increased river traffic and mining in the north prompted re-opening of the refinery in the 1930s. The Norman Wells refinery slowly developed until events of World War II triggered rapid construction of the Canol Road and pipeline. The Canol project was developed to ship oil from the Norman Wells refinery across the continental divide to Whitehorse. Upon further refining, the oil was to

be shipped to Alaska. Norman Wells served as a base camp for pipeline work, airplanes, and for oil production and exploration. A second camp was built immediately south of Norman Wells in October 1942 and a third camp was built approximately 7 km inland on higher and drier ground (Barry 1998). An airstrip was built at this location which soon became Camp Canol where 1700 people were stationed by September 1943.

Over two thousand kilometers of pipeline and telephone lines were laid from Norman Wells to Whitehorse, Yukon and Skagway, Alaska. The project was completed in less than two years and the pipeline operated for eleven months before it was shut down and disassembled. A great deal of military equipment was abandoned, while portions of the pipeline and other infrastructure were salvaged. From its approval in 1942 to final completion in 1944 and abandonment in 1945, the Canol pipeline and accompanying road ushered the influx of enormous amounts of machinery, goods, and labour. Despite being short-lived, the infrastructure and unfolding of the Canol project left a permanent impact on the land and its people.

2.6 ETHNOGRAPHY

At the time of direct contact between Indigenous peoples and Euro-Canadian explorers and traders, the western subarctic and western boreal forests of Canada were inhabited by a group of peoples speaking a series of closely related languages deriving from the larger Athapaskan linguistic stock (Auld and Kershaw 2005; Wilson 1986). Although the bulk of Athapaskan speakers were concentrated in the forested regions of the north, a few (such as Sarcee of southern Alberta and the Apache and Navaho of the American southwest) had adapted to other locations and environments (Auld and Kershaw 2005; Wilson 1986). Based on linguistic analysis, it is believed that these groups began to diverge no earlier than 2,500 years B.P. (Wilson 1986). The modern northern Dene-Athapaskan-speaking communities are sometimes collectively referred to as the Dene.

The Dene are further subdivided into a series of adjacent populations on the basis of language and geography. Along the Mackenzie valley, these groups include the Slavey speaking peoples of the Deh Cho and Sahtu regions, along with the Gwich'in speaking peoples of the lower Mackenzie and Mackenzie Delta regions (Auld and Kershaw 2005; Blondin 1997; Heine et al. 2007). The Inuvialuit Inuit are a non-Dene Indigenous group that traditionally inhabit the arctic and subarctic lands north of the tree line in the Northwest Territories (Bastedo 2010). Historically there has been interaction between the Dene (particularly the Gwich'in) and Inuvialuit across this boundary and along the course of the lower Mackenzie, and Inuvialuit influences can be identified throughout the northern communities of the Mackenzie valley Dene (Heine et al. 2007). The Métis are another important group with historical ties to the Mackenzie region. The fur trade brought Europeans of French, Scottish, and English ancestry to the area and many had children of mixed-native descent that went on to become important figures in both the fur trade and the ongoing development of the territorial polity (Bastedo 2010). Additional Métis would eventually migrate to the region from the south and east, and Métis communities were established within many of the emerging population centres (Bastedo 2010).

The modern history of Indigenous populations in the Northwest Territories has been heavily influenced by the discovery of oil near Norman Wells in 1920 (Blondin 1997). The Canadian government quickly entered into negotiations with local First Nations, necessitating the beginnings of their modern political organization (Auld and Kershaw 2005; Heine et al. 2007). In 1900, an adhesion to Treaty 8 was signed at Fort Resolution and, by 1921, Treaty 11 had been signed and enacted which essentially ceded direct control of the land to the government. Over the next 50 years, the First Nations of the Mackenzie region struggled to adapt to the changes in political and social organization that the Treaty had mandated (Blondin 1997). By 1975, the ongoing concerns of the Dene and Métis had led to the establishment of the Dene Nation, a political organization designed to support and address the concerns of the Indigenous peoples of the Mackenzie Valley (Asch 1986; Blondin 1997; Heine et al. 2007). The ensuing negotiations between the Dene Nation and the Canadian Government resulted in a land claims process that led to the establishment of the current territories and settlement areas, and the ongoing procedures for the remaining unsettled claims (Heine et al. 2007).

The AIA study area is located within the traditional territories of the Sahtu Dene and Métis. The following is a brief overview of ethnographic accounts related to these groups, with an emphasis on material culture, seasonal rounds and subsistence strategies as they relate to activities that are most likely to have left physical evidence of past human use of the landscape.

2.6.1 Sahtu

In 1993, the Sahtu Dene and Métis comprehensive land claim agreement with the Governments of Canada and the Northwest Territories was concluded and resulted (among other things) in the establishment of the SSA, encompassing and designating lands for co-operative management with the Sahtu First Nations (Auld and Kershaw 2005). The SSA is composed of lands surrounding and adjacent to the *Sahtu* (the Slavey name for Great Bear Lake) and includes vast areas to the northwest and southwest centered on the Mackenzie River basin (Auld and Kershaw 2005; Blondin 1997). The peoples of the Sahtu region speak North Slavey dialects and have traditionally been organized into regional populations. These include the Great Bear Lake people (*Sahtu Got'ine*) in the east, the Hare people (*K'asho Got'ine*) in the northwest, the Mountain people (*Shota Got'ine*) in the southwest, with the Willow Lake people (*Kaalo Got'ine*) in the centre (Auld and Kershaw 2005; Blondin 1997). These traditional regions are reflected in the modern administrative districts of the SSA which include Sahtu (in the east) and the two districts encompassing the Mackenzie basin: K'asho Got'ine (in the northwest) and Tulita (in the southwest).

The Sahtu Dene are represented by four First Nations situated in individual communities. The K'asho Got'ine First Nation (within the district of the same name) is located in Fort Good Hope (also known as *Radeli Ko* meaning home of rapids in north Slavey) along the banks of the Mackenzie River (Auld and Kershaw 2005; Bastedo 2010; Blondin 1997). Tulita (meaning "where the waters meet") was formerly known as Fort Norman and occurs in the district of Tulita at the confluence of the Mackenzie and Great Bear (*Sahtu Deh*) rivers (Auld and Kershaw 2005; Bastedo 2010; Blondin 1997). The Begade Shotagotine First Nation is based in Tulita and represents the combined interests of those Sahtu Dene

that identify with the former Mountain and Willow Lake regional populations (Auld and Kershaw 2005). Coleville Lake (also known as *K'ahbamitue* meaning "Ptarmigan Net Lake") and Deline (meaning "where the waters flow", and formerly known as Fort Franklin) are the other two communities outside of the Mackenzie Valley with established Sahtu Dene First Nations (Auld and Kershaw 2005; Blondin 1997). Norman Wells is a community that developed to service the local petroleum industry after oil was discovered in 1920. Following its establishment, a strong local Métis community began to develop populated largely by the descendants of Sahtu Dene and regional fur traders (Auld and Kershaw 2005).

Similar to the historic practices of people in the Deh Cho region, dispersal into small groups was a critical survival strategy for the Sahtu Dene in precontact times (Auld and Kershaw 2005). An informal clan system of land tenure was a natural extension of this way of life and developed over time in response to land use patterns based on kinship. These clan areas were particularly important in the winter months as familial groups would typically return to work trap lines within their home area (Auld and Kershaw 2005). The migration of the barrenland caribou in the fall months, however, resulted in aggregation of smaller groups for large communal hunts. This reliance on barrenground caribou was an important regional difference (relative to populations throughout the Deh Cho territory) for peoples across large parts of the SSA and was due to their proximity to the migrating herds (Auld and Kershaw 2005; Blondin 1997).

2.6.2 Northern Métis

Métis refers to those of mixed Indigenous and non-Indigenous ancestry who self-identify with local or regionally distinctive Métis cultural traditions, values, practices and heritage. In this way, Métis status is a "sociological condition" rather than a description of one's genetic background (Slobodin 1981). Métis groups trace their heritage back to the Canadian fur trade, as the descendants of predominantly male, European (often French or Scottish) fur traders and explorers or *coureurs des bois* and local Indigenous women. Populations differ based on local engagements with the fur trade and the histories of Métis settlement and movement through the region. Slobodin (1981) describes the Northern Métis, a general group of Métis located in the area north of Fort Simpson along the Mackenzie River to the arctic coast and west through the Yukon to the Alaskan border, as sharing a common history of involvement with the fur trade, and a similar cultural heritage. The majority of these Northern Métis descend from unions between fur traders and local Indigenous peoples occurring since the 1850s. Maternal ancestry of Northern Métis is predominantly Athapaskan, while many are descended from mainly Scottish, but also English, Irish, German, or Scandinavian, male fur traders. Fur traders during this period were likely associated with the Hudson's Bay Company, and several common Northern Métis family surnames include Camsell, Firth, and Gaudet.

As descendants of fur traders and local Indigenous groups, Métis often acted as intermediaries between Indigenous and Euro-Canadian trappers and traders in a variety of different occupations. Included among these was the function of Métis as transporters of goods or as guides during expeditions. Métis worked as canoe or boatmen, mail drivers, steamboat deckhands, or river pilots and developed large networks communication and distinctive traditions as a result. Slobodin (1981) contends that this "long distance sociability" resulting from widespread Métis involvement in travel and transportation during the

fur trade is a significant characteristic of Métis ethnicities. Other significant cultural markers include the Assomption, or arrowpoint sash, which was used throughout the subarctic by Métis boatmen as decoration (Slobodin 1981). Evidence of its continued importance to Métis heritage can be seen in its use, both symbolically and materially, by contemporary Métis in the Northwest Territories. While subarctic Métis primarily were employed as "movers of men and materials," or as transportation laborers during the fur trade, many Métis engaged in other types of employment, including trapping, hunting or fishing for trading posts, as interpreters or as traders and trading post managers (Slobodin 1981). As hunters or fishers during the nineteenth and early twentieth centuries in the north, Métis were regularly contracted to provide food for humans and sled dogs at trading posts, missions and missionary schools (Slobodin 1981). Métis involvement as intermediaries between trappers and traders, and their "special knowledge of local conditions, fur values and aboriginal languages" initially led several to be employed at various trading posts as interpreters but also as trading post managers (Slobodin 1981).

Eleven local Métis organization/societies are represented in the Northwest Territories, and include the Aklavik Northwest Métis Council, Hay River Métis Council, Fort Resolution Métis Council, Fort Providence Métis Council, Yellowknife Métis Council, Métis Association Local #54 (Fort Good Hope), Fort Smith Métis Council, Métis Nation Local #52 (Fort Simpson), Inuvik Métis Council, Tulit'a Land Corporation, and the Norman Wells Land Corporation. Together, the Hay River, Fort Resolution and Fort Smith Métis Councils comprise the Northwest Territories Métis Nation, which represents the Métis of South Slave.

2.7 PREVIOUS ARCHAEOLOGICAL WORK

The following section outlines previous archaeological work with particular emphasis on archaeological site types and site locations as they relate to future archaeological assessments and management of archaeological resources in the study area.

2.7.1 Previous Archaeological Work within Study Area

Archaeological assessments that have been conducted within the vicinity of the study area include: the Mackenzie Highway System, Permit 1973-334 (Millar and Fedirchuk 1974); the Mackenzie River Cabin Survey, Permit 1983-530 (Hanks and Winter 1983); the Mackenzie Gas Project, Permits 2002-916, 2004-956, and 2006-978 (Clarke et al. 2003; Clarke and Webster 2005; Webster et al. 2007), The Mackenzie Valley Fibre Link (MVFL) Project, Permits 2014-017 and 2015-002 (Leyden et al. 2016), and the Granular Supply Source Areas along the Mackenzie (No.1), Liard (No.7) and Proposed Mackenzie Valley Highway, Permit 2016-004 (Heffner and Young 2020).

Preliminary investigation of the Mackenzie Highway in 1973 was completed in three sections, covering the area between Fort Simpson and the junction with the Dempster Highway, approaching Inuvik. The comprehensive survey recorded a total of 133 sites of archaeological interest, including 66 precontact sites and 67 historic or recent sites (Millar and Fedirchuk 1974). Of these, only two are within 2 km of the current Project; precontact lithic artifact scatter site LcRo-1 and historic cabin site LcRo-3 are both

situated on Little Smith Creek near its confluence with the Mackenzie River, near to Prospect 9.002. Nearby, also within 2 km of Prospect 9.002, an additional historic cabin site (LcRo-4) was subsequently recorded by the Mackenzie River Cabin Survey in 1982 (Hanks and Winter 1983).

The Mackenzie Gas Project was an extensive, multi-year project that assessed a proposed natural gas project that included: three natural gas field developments at Taglu, Parsons Lake, and Niglintgak; a liquid natural gas pipeline extending from Inuvik to Norman Wells; and a natural gas pipeline that extends along the Mackenzie Valley from Inuvik to northwest Alberta (Clarke et al. 2003; Clarke and Webster 2005; Webster et al. 2007). Archaeological investigations during the Mackenzie Gas Project identified one archaeological site that is located within the Project footprint, historic period campsite LgRr-1. In addition, precontact lithic artifact scatter sites LcRo-6 and LcRo-7, as well as precontact campsite LcRo-8, were all identified within 2 km of the current AIA study area.

The Mackenzie Valley Fibre Link Project assessed a fibre optic telecommunications cable and related facilities between the McGill Lake Microwave Site, just southeast of the junction of Highways 1 and 7, and the town of Inuvik. The project study area included a corridor along portions of the Mackenzie Valley Highway. A total of 29 precontact period sites and 41 historic period sites were identified over the course of the 2014 and 2015 investigations (Leyden at al. 2016). Two precontact sites (lithic scatter LfRr-6 and isolated find LfRr-7) are within 2 km of the access for Prospect 7.109.

The Granular Supply Sources along the Mackenzie (No.1), Liard (No.7) and Proposed Mackenzie Valley Highway project assessed proposed granular supply sources, bedrock supply sources, associated access roads and stockpile areas located along the Mackenzie (No.1) and Liard (No.7) Highways, and a section of the Proposed Mackenzie Valley Highway between Norman Wells and Tulita. In total, nine newly identified archaeological sites were recorded during the AIA. All of the sites consist of precontact surface and/or subsurface lithic artifacts (Heffner and Young 2020). Three of the sites (LgRr-2, LgRr-3, and LgRr-5) are within Prospect 7.109, and a fourth (LgRr-4) is within 2 km of the same potential bedrock quarry.

3 HERITAGE RESOURCES

3.1 DEFINITION

In the Northwest Territories, archaeological resources are protected as per the *Archaeological Sites Regulations* (R-024-2014) under the *Archaeological Sites Act* S.N.W.T. 2014, c.9. Archaeological sites are defined as any location where an archaeological artifact that cannot be demonstrated to have been in an unbroken chain of possession, including any tangible evidence of human activity in excess of 50 years (1971 as of issuance of this permit), is found. This can include precontact, historic, and certain types of Indigenous traditional use sites. Palaeontological sites have also been recorded in the territory, although they are not covered under the *Archaeological Sites Act* S.N.W.T. 2014, c.9.

Precontact archaeological sites include materials (e.g., stone tools, butchered bones, fire-broken rock and features such as hearths) resulting from the traditional occupation of the Northwest Territories by Indigenous people before contact with European traders or explorers. Historic archaeological sites can be Indigenous and non-Indigenous, and date from the time of European contact until approximately 1970. Historic period sites can include structures (e.g., cabins, forts, industrial/mining sites), artifacts (e.g. industrial and folk-manufactured items made of metal, glass, ceramic, stone and other materials) or features (e.g. trails, foundations, depressions and campsites). Traditional use sites are identified in consultation with members of Indigenous communities and may include camping or hunting/trapping locales, ceremonial gathering areas, or areas related to spiritual matters.

3.2 POTENTIAL IMPACTS

Due to the fact that precontact archaeological, historical, palaeontological, and traditional use sites represent discrete episodes of past activities, they are non-renewable and, therefore, are susceptible to alteration or removal by development. Precontact and historical archaeological resources are comprised of residues of past cultures. Although the cultural entities responsible for deposition of the archaeological material are unavailable for observation, the preserved context and associations in which the remains functioned can reveal many clues about past human behaviour, adaptations and relationships to the natural world. The key to the interpretation of these resources, however, is in their pattern of cultural deposition, which is extremely fragile, ephemeral, and the product of unique processes and conditions of preservation. Consequently, once they are disturbed, they cannot be replaced, recreated or restored. Due to the nature of their origin and preservation, archaeological resources are finite in quantity. As a result, archaeological resources are increasingly susceptible to destruction and depletion through natural and cultural disturbances.

3.3 MITIGATIVE OPTIONS

Adverse primary impacts to historical 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. In cases where the heritage value of an archaeological site is considered to be low, photographic documentation, recording, and collection of surface specimens may represent sufficient mitigative measures. In cases where the heritage value of an historical resource site is identified as high, however, more detailed investigative measures, such as controlled excavation, may be necessary.

4 METHODS

The scope of the archaeological assessment was based on the results of the broader AOA (Peach 2021), which was reviewed and approved by Culture and Heritage. Field studies were subsequently conducted using both the results of the AOA desktop studies as well as in-field observations.

4.1 RECORD REVIEW

The record review, completed largely as part of the AOA preparation (Peach 2021), consisted of a site file search of known archaeological sites on record with Culture and Heritage, which included a data licence application. Given that various potential borrow and quarry sites have been evaluated and assessed within the MVWR corridor since the early 1970s, one of the primary objectives of the AOA was to compile and review data from previous assessments, incorporating evaluations of archaeological potential, previously identified archaeological and/or traditional land use sites, site-specific recommendations, and regulatory requirements. Relevant data sets included previous permit reports and associated GIS data and site forms. Additional information relative to terrain and environment, especially including LiDAR, ArcticDEM, and satellite imagery were reviewed to assess the archaeological site potential of the Project area. Relevant previous archaeological studies were also referenced to refine landscape evaluations and limit redundancy in assessment areas. These included:

- the Mackenzie Gas Project, permits 2002-916, 2004-956, and 2006-978 (Clark et al. 2003; Clark and Webster 2005; Webster et al. 2007)
- the Mackenzie Valley Fibre Link (MVFL) Project, permits 2014-017 and 2015-002 (Leyden et al. 2016)
- and the Granular Supply Source Areas along the Mackenzie (No. 1), Liard (No. 7) and Proposed Valley Highway, permit 2016-004 (Heffner and Young 2020)

Target areas with high archaeological potential were selected based on the results of the desktop review. In preparation for the ground reconnaissance portion of the AIA, the AOA results were reviewed.

4.2 AIA FIELD PROCEDURES

4.2.1 Helicopter Overflight

For each of the assessed HPAs, a helicopter overflight was completed in advance of any pedestrian survey, partially in order to evaluate the terrain, and also to identify landing locations. The proposed quarry and borrow areas were entered into a mounted GPS unit in the helicopter to facilitate the assessment, with greater accuracy than achieved using the handheld GPS. High potential areas were evaluated and photographed, and tracks illustrating the overflight are illustrated in Appendix A.

4.2.2 Pedestrian Survey

Target areas were assessed by crews consisting of four people (~10 m apart, 20-30 m visibility), throughout portions of the proposed development footprint that were identified during the AOA as having high archaeological potential. Maps illustrating AIA coverage are included in Appendix A of this report.

Pedestrian survey was judgmental in design and the brief traverses targeted notable topographic features (e.g., saddles, knolls, and ridge tops) and surface exposures (e.g., previously disturbed areas, tree throws, cut banks, wind exposures, and areas with limited soil development) to identify above ground or exposed subsurface artifacts and features. Furthermore, several discrete locations that were considered to have high archaeological potential and were suitable for shovel testing were identified and recorded during these traverses. These potential areas consisted of ridge and terrace features that are referred to as having either low or high archaeological potential. When viewing the AIA results it is important to note that low potential does not mean *no* potential. It is possible for archaeological sites to be located outside of the areas that were examined and tested during the field program.

4.2.3 Subsurface Testing

Ground truthing of areas with high archaeological potential was conducted through a combination of visual assessment and shovel testing. Fortuitous exposures, primarily tree throws, bedrock exposures, and areas that had been exposed by erosion, were examined for evidence of cultural material. Visual inspection of these areas was typically considered adequate for assessing the presence of cultural remains. Areas where there was a higher potential for the presence of buried cultural deposits were subjected to excavation of shovel tests. Each test measured approximately 40 cm by 40 cm, with variable depth dependent upon local soil conditions, generally excavated to ‘C’ horizon. Sediments were passed through ¼” steel mesh screen, except in the case of very compact clay or saturated soils, which were hand sorted and inspected. All subsurface test locations were recorded using a handheld GPS unit.

4.3 SITE EVALUATION

The nature of evaluation completed at an identified site is partially contingent on the type of the site identified. At surficially exposed sites, a subsurface testing program, consisting of a minimum of four shovel tests (each approximately 40 cm by 40 cm in size) is implemented to determine whether undisturbed cultural deposits occur. Cultural specimens are collected from the surface if they are temporally diagnostic, finished tools, or are representative of the observed cultural materials. All artifacts encountered in shovel tests are collected. The locations of shovel tests are mapped relative to the site and site features.

Sites with remains in buried contexts generally require a more intensive evaluation program in order to define site parameters. Generally, a larger number of shovel tests are excavated to obtain the required data. The specific program is contingent on the perceived nature of the site.

4.4 SITE DESIGNATION

Archaeological sites are referred to by a Borden Number which consists of a four-letter symbol accompanied by a number (e.g., LdNs-11). This uniform site designation scheme for archaeological sites in Canada was developed by archaeologist Charles Borden (1954). North of latitude 62° (Figure 4-1) in this system, 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 refer to specific sites within the blocks and are assigned sequentially by Culture and Heritage.

4.5 SITE DOCUMENTATION

Hand-held GPS units are used to record the location of sites encountered during ground reconnaissance; site locales are recorded using the Universal Transverse Mercator (UTM) Grid Reference (NAD 83). The relationship of each site to the proposed Project is denoted. The condition of each site and site characteristics are documented and include apparent site integrity, estimated site dimensions, content, setting, and complexity. Each site is photographed and documented relative to the Project in a sketch map prepared to illustrate the site setting, shovel test locations, and the relationship to the Project.

4.6 SITE CLASSIFICATION

Each site identified is classified based on its primary physical attributes and/or predicted primary function. Precontact and historic site types include isolated finds, artifact scatters, campsites, quarries, stone features, cabins, and mine sites. Stone feature sites are stone alignments or configurations resulting from past human activity. Depending on the configuration of these features, function may be ascribed to these sites, including campsites, drive lanes, hunting blinds, or caches.

4.7 EVALUATION OF HERITAGE VALUES

Site values are determined based on the results of the field program as well as the regional archaeological context. Generally, relative site value is based on the data obtained to date. Factors considered include site type, size, and complexity, presence or absence of subsurface materials and features, and number of artifacts observed. The scientific value of a specific site is deemed to be low if substantial disturbance or exposure has occurred or at sites with single artifacts or single features of limited antiquity. Sites at which large quantities of artifacts or diagnostic artifacts are present, or at which cultural stratification, or a large number of stone features, occur (particularly if they contain rare or unusual features), are classified as having high scientific value. In addition to these tangible variables, each site is viewed from the perspective of the regional data base. Public, including Indigenous, perspective of site value is also an important criterion in evaluating identified sites.

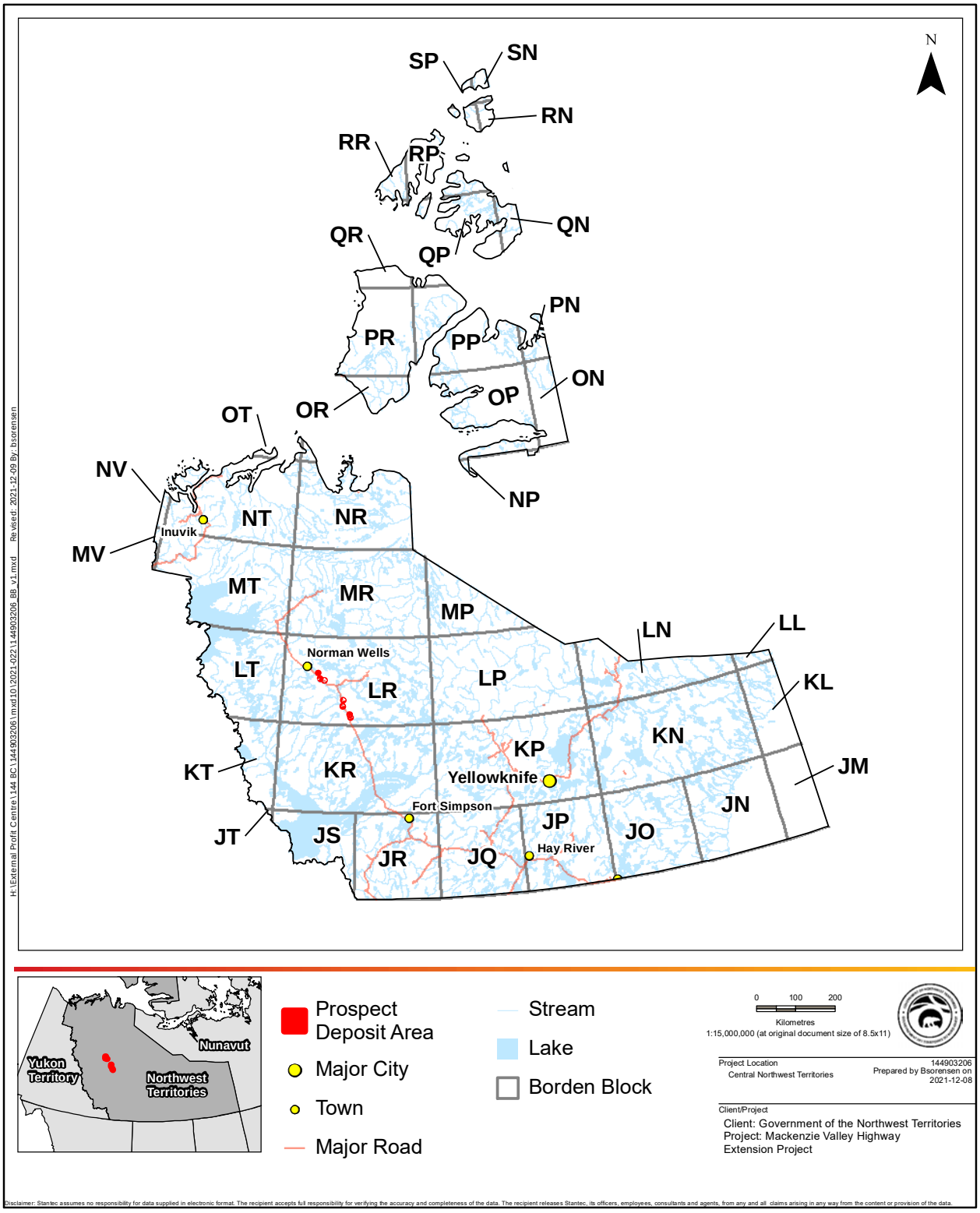

Figure 4-1 Northwest Territories Borden Blocks with Project Location

4.8 FORMULATION OF RECOMMENDATIONS

Site-specific recommendations are formulated primarily on the basis of the level of available information, data collected, and perceived site value within the context of the predicted impact. Because historical resources are non-renewable and damage to their contents and contexts is irreversible, avoidance is recommended as the preferred option at sites of moderate to high archaeological value. Sites of limited heritage value (for example, isolated finds) are generally recommended for no further study and are not considered for avoidance or additional study, as the data collected at the AIA stage effectively reduces or eliminates impact from the proposed activities. Further study is recommended at sites with moderate to high heritage value that cannot be avoided and at which the data collected during the AIA are considered to be insufficient to mitigate effects from the proposed development.

In general, recommendations for further work are made if sites are to be impacted by the Project and if the site is of moderate to high heritage value. Adequate additional study generally involves scientific investigations that are designed to systematically explore and reconstruct the activities that were carried out at the sites. Investigations may involve excavation of buried sites, controlled collection of surface sites, detailed mapping and photographic documentation. At sites containing surficial features (for example, stone features or historic structures) that may be impacted by the proposed development, individual feature and site mapping are consistently recommended, regardless of whether or not additional subsurface mitigation is recommended. These mitigative measures are recommended as a means of providing a permanent record of the individual features.

5 RESULTS

5.1 RECORD REVIEW

The results of the site file search completed by Culture and Heritage indicated that four archaeological sites (LgRr-1, LgRr-2, LgRr-3, and LgRr-5) had been previously recorded within the footprint of the prospects and access corridors to be assessed in 2021. The first of these (LgRr-1) is situated on a high bedrock ridge in Prospect 7.090, overlooking a small lake near Prohibition Creek. The other three previously recorded sites are all located on various bedrock ridges and knolls in Prospect 7.109, north of the Bear Rock geological upland feature. Only site LgRr-1 was revisited during the field program; field weather conditions prohibited a thorough assessment of the other three, for which avoidance areas have already been defined (see Heffner and Young 2020).

Outside of the Project footprint, other nearby previously recorded sites include precontact lithic artifact scatter site LfRr-6, precontact isolated find site LfRr-7, and precontact hunting lookout or campsite LgRr-4, all three of which are within 2 km of Prospect 7.109 or its access. Within 2 km of Prospect 9.002, precontact lithic artifact scatter sites LcRo-1, LcRo-6, and LcRo-7, Indigenous historic campsites (cabins) LcRo-3 and LcRo-4, and precontact campsite LcRo-8, have all been recorded in proximity to Little Smith Creek. Additional previously recorded archaeological sites are over 2 km from the edges of the Project components investigated during the field program. No previously recorded sites outside of the Project footprint were to be investigated during the ground reconnaissance.

A total of 24 high potential areas (HPAs) were identified within the seven prospects and/or their associated access corridors.

5.2 GROUND RECONNAISSANCE

A total of 116 shovel tests were excavated in areas where substantial soil development had occurred, primarily related to three shovel test areas (STAs) within Prospect 7.083 and two STAs along the access to the same prospect. Shovel tests were also excavated in STAs identified within the access corridor leading to Prospect 7.109, and within Prospect 9.002, as summarized in Table 5-1 and illustrated in Appendix A. None of the shovel tests yielded cultural materials.

In addition to the STAs where it was possible to complete subsurface testing, six STAs were identified in Prospect 7.109. Shovel testing in these areas was not completed because snow cover prevented a thorough surface survey.

Of the four previously recorded archaeological sites, only LgRr-1 was revisited under the current permit. The other three sites (LgRr-2, LgRr-3, and LgRr-5) could not be evaluated during the current assessment due to snow cover. It is recommended that the avoidance areas surrounding these sites, as defined under Permit 2016-004 (Heffner and Young 2020), be maintained until they can be fully assessed.

Table 5-1 AIA Results Summary

Project Component	High Potential Area	Shovel Test Area	Vegetation	Topography	Approx. Size (of STA)	Archaeological Potential	Shovel Tests and Exposures (- negative, + positive)	Shovel Test Spacing	Sites	Recommendations
Prospect 7.083	HPA01	STA02	Black spruce dominated mixed forest, Labrador tea, caribou lichen	High, prominent ridge overlooking small lake, narrow	30 m by 10 m	High	12-	5 m to 10 m	None	No further assessment recommended
		STA03	Black spruce dominated mixed forest, recently burned	Level bench down slope from ridge crest	20 m by 20 m	High	12-	5 m	None	No further assessment recommended
		STA04	Black spruce dominated mixed forest, Labrador tea, caribou lichen, some cut stumps near northwest end	High, prominent ridge overlooking small lake, narrow	70 m by 10 m	High	34-	5 m to 10 m	None	No further assessment recommended
Prospect 7.083 access	HPA02	Helicopter overflight assessment	Existing trail with grasses and low shrubs, mixed spruce and tamarack	Gently undulating with no well-defined landforms near watercourse crossing	n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA03	Helicopter overflight assessment	Existing trail with grasses and low shrubs, mixed spruce and tamarack	Gently undulating with no well-defined landforms near watercourse crossing	n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA04	STA01	Existing trail with grasses and low shrubs, mixed spruce, willow, and occasional birch	Small, low, N-S trending ridge on east side of existing trail near minor drainage crossing	20 m by 10 m	High	9-	5 m	None	No further assessment recommended
	HPA05	STA13	Existing trail with grasses and low shrubs, intact vegetation dominated by black spruce, caribou lichen and kinnikinnick understory	Slight rise in otherwise gently undulating terrain, overlooking small, low wet area	25 m by 12 m	High	11-	5 m	None	No further assessment recommended
	HPA06	Helicopter overflight assessment	Existing trail with grasses and low shrubs, mixed spruce and tamarack	Gently undulating with no well-defined landforms near watercourse crossing	n/a	Low	n/a	n/a	n/a	No further assessment recommended
Prospect 7.090	HPA07	Previously shovel tested under Permit 2006-978	Regrowth dominated by willow and juvenile aspen, with sparse birch and white spruce	Level crest of broad, prominent bedrock ridge overlooking lake to northeast	n/a	High	n/a	n/a	LgRr-1	No further assessment recommended

Table 5-1 cont'd

Project Component	High Potential Area	Shovel Test Area	Vegetation	Topography	Approx. Size (of STA)	Archaeological Potential	Shovel Tests and Exposures (- negative, + positive)	Shovel Test Spacing	Sites	Recommendations
Prospect 7.109	HPA08	Partially assessed under Permit 2016-004	Mixed forest comprised largely of spruce, tamarack, and willow	Crest of high bedrock knoll	140 m by 55 m	High	Testing incomplete		LgRr-2	Assessment of area around LgRr-3 recommended prior to ground disturbance
	HPA09	STA05	Mixed forest comprised largely of spruce, birch, tamarack, and willow, sparse on ridge crests	Mostly steeply sloped down and away from higher ridge where site LgRr-2 is situated, with exception of narrow E-W trending ridge at STA05	40 m by 40 m	Low to High	Testing incomplete		n/a	Assessment of STA05 recommended prior to ground disturbance
	HPA10	STA06	Mixed forest comprised largely of spruce, birch, tamarack, and willow, sparse on ridge crests	Narrow E-W trending bedrock ridge coming to end at west with sharp drop down towards set of small lakes	170 m by 40 m	High	Testing incomplete		LgRr-5	Assessment of STA06, STA07, STA08, STA09, STA10, and area around LgRr-5 recommended prior to ground disturbance
		STA07	Mixed forest comprised largely of spruce, birch, tamarack, and willow, sparse on ridge crests	Narrow E-W trending bedrock ridge coming to end at west with sharp drop down towards set of small lakes	125 m by 40 m	High	Testing incomplete			
		STA08	Mixed forest comprised largely of spruce, birch, tamarack, and willow, sparse on ridge crests	Knoll on edge of drop down into broader Mackenzie River valley with set of small lakes	40 m by 40 m	High	Testing incomplete			
		STA09	Mixed forest comprised largely of spruce, birch, tamarack, and willow, sparse on ridge crests	Narrow E-W trending bedrock ridge coming to end at west with sharp drop down towards set of small lakes	125 m by 40 m	High	Testing incomplete			
		STA10 (defined during helicopter overflight)	Mixed forest comprised largely of spruce, birch, tamarack, and willow, sparse on ridge crests	Set of two narrow E-W trending bedrock ridges with undulating area between	165 m by 135 m	High	Testing incomplete			
	HPA11	Partially assessed under Permit 2016-004	Mixed forest comprised largely of spruce, tamarack, and willow	Exposed knoll and crescent-shaped bedrock ridge extending southeast and west	200 m by 150 m	High	Testing incomplete		LgRr-3	Assessment of area around LgRr-3 recommended prior to ground disturbance

Table 5-1 cont'd

Project Component	High Potential Area	Shovel Test Area	Vegetation	Topography	Approx. Size (of STA)	Archaeological Potential	Shovel Tests and Exposures (- negative, + positive)	Shovel Test Spacing	Sites	Recommendations
Prospect 7.109 access	HPA12	STA11	Densely forested mix of spruce, tamarack, birch, and willow	Fairly prominent E-W trending ridge in otherwise undulating terrain sloping down towards south; ridge drops sharply on south, more gradually on north	25 m by 15 m	Low to High	9-	5 m to 10 m	None	No further assessment recommended
Prospect 8.039	HPA13	Helicopter overflight assessment, STAs undefined	Pine-dominated regrowth on height of land, abundant deadfall	High upland knoll overlooking an unnamed creek to the northeast; gradual, steady slope up towards the height of land from the south, followed by a sharp drop on the north side into a broad, level plain	n/a	High	n/a	n/a	n/a	Further assessment of modified high potential area recommended
Prospect 8.039 access	HPA14	Helicopter overflight assessment	Mix of spruce, aspen, and pine; no wetlands observed, variations in vegetation caused by differential regrowth patterns following forest fires	Gently sloping down towards west, with minor undulations	n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA15	Helicopter overflight assessment			n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA16	Helicopter overflight assessment			n/a	Low	n/a	n/a	n/a	No further assessment recommended
Prospect 9.002	HPA17	Ground assessment	Dense regrowth dominated by willow, birch, and aspen	Gradual, steady slope down towards broad creek valley, all below break-in-slope	n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA18	STA12	Mixed regrowth variously dominated by willow, sparse pine, mixed spruce, and aspen	Level upper plain leading to edge of broad creek valley; gradual, steady slope below break-in-slope	60 m by 26 m	Low to High	29-	5 m	None	No further assessment recommended
Prospect 9.019 access	HPA19	Helicopter overflight assessment	Overgrown old trail with dense tamarack and willow regrowth, surrounding area dominated by mixed willow, spruce, birch, and sparse pine	Level to slightly undulating with a gradual slope up towards the east, generally lacking in landform definition	n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA20	Helicopter overflight assessment			n/a	Low	n/a	n/a	n/a	No further assessment recommended
Prospect 9.025B	HPA21	Helicopter overflight assessment, STAs undefined	Mixed spruce, pine, tamarack, and birch	Very high series of parallel bedrock ridges with broad, level areas in between, pronounced drops to west, north, and east	n/a	High	n/a	n/a	n/a	Further assessment of modified high potential area recommended

Table 5-1 cont'd

Project Component	High Potential Area	Shovel Test Area	Vegetation	Topography	Approx. Size (of STA)	Archaeological Potential	Shovel Tests and Exposures (- negative, + positive)	Shovel Test Spacing	Sites	Recommendations
Prospect 9.025B access	HPA22	Helicopter overflight assessment	Mixed spruce, tamarack, and birch	Steady, fairly steep slope leading up towards planned quarry	n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA23	Ground assessment	Dense regrowth dominated variously by pine, willow, and black spruce	Mostly level with minor undulations, small ill-defined knoll at north end	n/a	Low	n/a	n/a	n/a	No further assessment recommended
	HPA24	Ground assessment	Dense regrowth dominated variously by pine, willow, and black spruce	Mostly level with a small, dry, ill-defined channel near the south end, generally lacking definition throughout	n/a	Low	n/a	n/a	n/a	No further assessment recommended

5.2.1 Prospect 7.083

A single HPA was identified by the AOA (Peach 2021) within the potential quarry boundaries, representing what was interpreted as the crest and edge of a high northwest-southeast trending ridge. As encountered during the AIA, the ridge crest was slightly offset from the desktop data sources and, as a result, much of the assessment targeted areas outside of the HPA. Three STAs were identified in the area within surrounding the HPA (STA02, STA03, and STA04). Both STA02 and STA04 are found on the ridge crest, near the western and eastern ends, respectively, of the landform inside the Project boundaries. Each is characterized by comparatively level terrain, where the ridge top is narrow and measures approximately 5 m to 10 m in width. A total of 46 shovel tests were excavated within these two STAs, 12 in the western and 34 in the eastern. Shovel test area 02 measures approximately 30 m in length, while STA04 measures approximately 70 m; each was tested at intervals of about 5 m to 10 m. Between STA02 and STA04, the ridge crest continues outside of the prospect footprint, while the edge of the proposed quarry is set within steadily sloping terrain. Away from the top of the ridge, STA03 was situated on a small, level bench on the southwest side of the main landform, which measured approximately 20 m by 20 m (Plate 5-1). This area was the only exception to the otherwise sloping terrain, and featured an exceptional viewshed across the broader Mackenzie River valley, including a small lake to the south. A total of 12 shovel tests were excavated in STA03, at an average interval of approximately 5 m. None of the shovel tests at any of the three STAs yielded cultural materials, nor were any observed on the surface. No further study is recommended at Prospect 7.083.

The 7.8 km access corridor from the MVWR largely follows an existing trail, crossing several minor drainages. As a result, five HPAs (HPA02 through HPA06) were identified in the AOA (Peach 2021). All five were assessed by helicopter overflight, and two STAs were identified (STA01 and STA13); elsewhere along the route, the terrain was unremarkable for its lack of topographic definition in the vicinity of the creeks or wetlands. Both of the STAs were situated on minor drainages identified during completion of the AOA (Peach 2021). At STA01, a high east-west trending ridge was observed to the west outside of the assessment area, with a lower north-south trending landform on the east side of the existing corridor (Plate 5-2). A small creek separates the two topographic features, and nine shovel tests were excavated on the lower ridge, within an area measuring approximately 20 m by 10 m (i.e. STA01), at an interval of approximately 5 m. Closer to the existing MVWR, STA13 is situated on a south-facing level bench overlooking a small, ill-defined drainage channel (Plate 5-3). The intact portion of the landform was tested at an approximate interval of 5 m, within an area measuring about 25 m by 12 m; a total of 11 shovel tests were excavated on this landform. None of the shovel tests in the two STAs along the access corridor yielded cultural materials. Some modern objects, likely associated with ongoing use of the access route, were observed along the margins of the cutline, although nothing that was culturally or temporally diagnostic. No further study is recommended for the planned access to Prospect 7.083 as illustrated herein; if the route deviates from the existing trail, the new corridor should be separately evaluated.

Plate 5-1 View southwest showing tested bench around STA03 on south side of ridge in Prospect 7.083

Plate 5-2 View north along small low ridge in assessed access to 7.083, STA01

Plate 5-3 View west showing STA13 landform in access to Prospect 7.083

5.2.2 Prospect 7.090

Based on the previous identification of historic archaeological site LgRr-1, a single small HPA was identified by the AOA within bedrock quarry Prospect 7.090 (Peach 2021). Otherwise, the footprint was noted as having been assessed in its entirety during previous AIA studies for the Mackenzie Gas Project completed under Permit 2006-978 (Webster et al. 2007); portions had also been previously evaluated under Permits 2002-916 (Clarke et al. 2003) and 2004-956 (Clarke and Webster 2005). A 150 m buffer was placed around the previously recorded site, to facilitate site avoidance, and this area was subsequently used to define the HPA for assessment under the current permit.

No HPAs were identified along the access corridor, which was perceived to have low archaeological potential due to its route extending away from the higher landform, lake, and creek. This evaluation was reinforced through a brief helicopter overflight.

Site LgRr-1

Previously recorded historic archaeological site LgRr-1 was identified in 2006 as part of the assessment for the Mackenzie Gas Project (Webster et al. 2007). The site area was easily relocated given the identification of a number of surface artifacts. The 2006-978 permit report describes two concentrations of artifacts or cultural materials, the first including a 55-gallon drum, two fuel cans, several tin cans, a stove pipe, a hammer head, and a hand pump fire extinguisher, and the second characterized by the presence of an enameled coffee pot, metal cans, and bottles (Webster et al. 2007).

Items that were identified during the current visit include four standard 55-gallon oil barrels, a section of galvanized stove pipe, three metal jerry cans, the hand pump fire extinguisher, a metal bucket, and an unidentifiable scrap metal object made of thick iron embedded in the ground (Figure 5-1). Three of the oil barrels (objects 7, 8, and 9) were arranged in a linear way, slightly removed from the remainder of the cultural materials, and two of the bases were stamped with “Imperial Oil Limited not returnable for credit” or “Property of Imperial Oil Limited” (Plate 5-4). Although this might indicate an association with Imperial Oil projects in the region (such as the oil extraction ventures at Norman Wells or related development of the Canol Project), the barrels have also been available for purchase and use by other industrial actors and do not necessarily indicate ownership. The surface materials were encountered in an area measuring approximately 50 m by 20 m. None of the more transportable materials, like tin cans and glass bottles, were identified under the current revisit, possibly as a result of combined snow and leaf cover, although the other items were easily identifiable.

Due to the presence of a small stamp in the base of one of the galvanized metal jerry cans, the example found at surface find 2 (see Figure 5-1) was collected for a more controlled analysis. The cannister measures approximately 6 ½” in diameter, and 9” in height, with an estimated volume of approximately 1 imperial gallon. It has a small spout near one edge of its domed top, which is marked by impressed petals expanding outward from the central opening. The sides feature a central panel with diagonal ribbing. The impressed circle on the base includes the phrase “Design Patent” along with a series of illegible numbers.

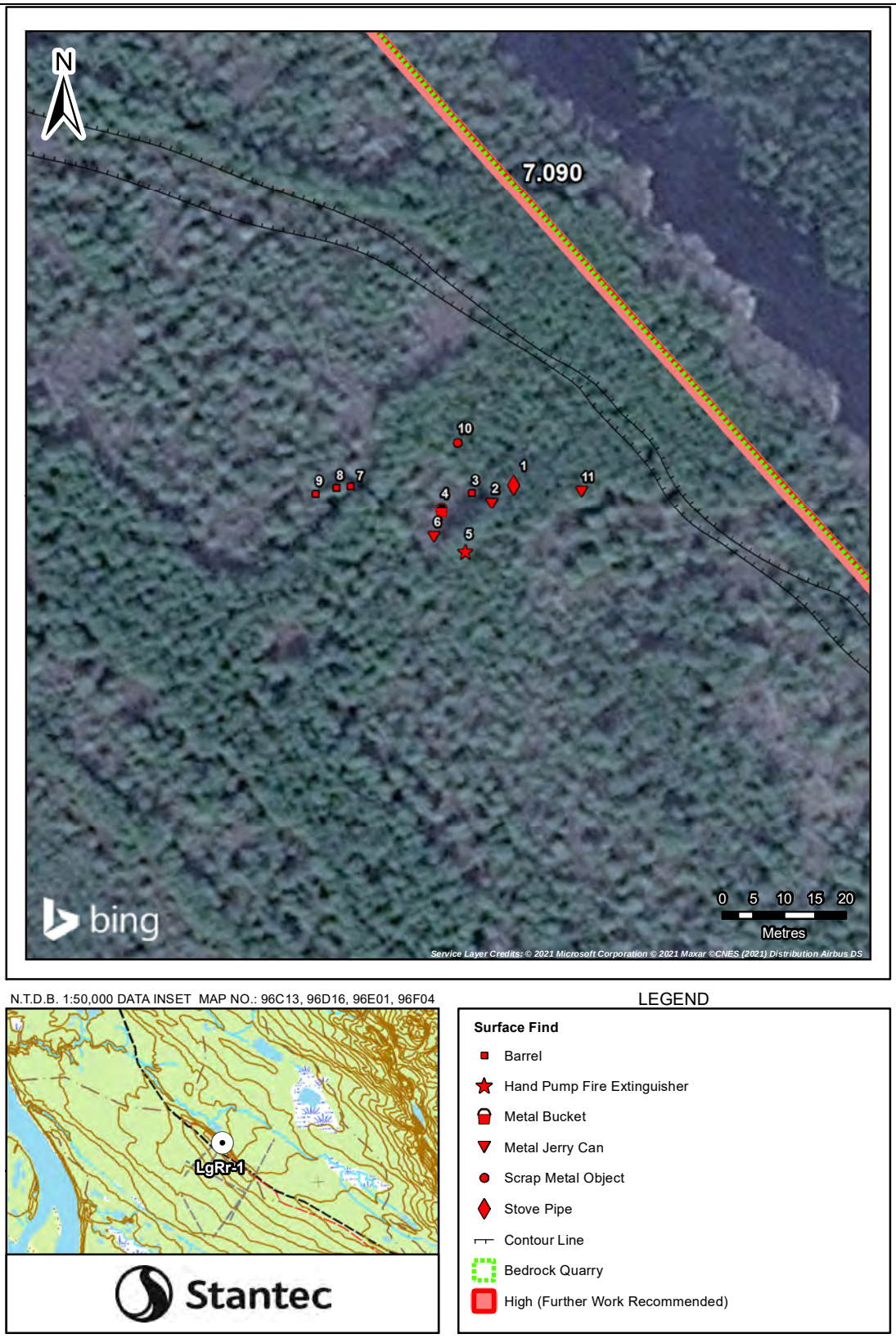

Figure 5-1 Site LgRr-1 sketch map

Plate 5-4 Base of oil barrel at find location 9 at site LgRr-1 with stamped property notification

In form and decorative style, albeit not size, the fuel can is similar to “vintage” 5-gallon cans found for resale on various internet websites that sometimes traffic in antique items (i.e. eBay). Those that are in better condition are commonly listed as “Old Ironsides” manufactured by the New Delphos Manufacturing Company out of Ohio, USA, which operated between 1898 and 1990. This identification is based largely on similarities in the petal pattern on the top of the can, and the angled corrugations on the sides (Plate 5-5). By the constantly changing nature of these retail websites, the information is of unfortunately dubious quality or accuracy.

Vegetation in the site area is dominated by regrowth of willow and aspen, along with sparse birch and white spruce, following forest fires (and possibly forestry activities) approximately 15 to 20 years prior. Old overgrown trails and cutlines in the immediate area are visible from the air and in satellite imagery, although the changes in vegetation indicating the travel routes were indistinguishable on the ground during the time of year of the revisit.

Given that the landform was subject to extensive shovel testing under the previous investigation, no additional subsurface inspection was completed during the current field program. According to the site form, only three shovel tests were excavated in the immediate site area, although 388 in total were excavated within the prospect as a whole (Webster et al. 2007).

The site was previously reported as representative of an historic camp occupation (Webster et al. 2007). Based on the industrial nature of the documented materials present under the current assessment, the deposits might represent a refueling station or temporary stopping point associated with forestry, mining, or quarrying activities. No materials indicative of a precise age beyond what was previously reported (i.e. glass bottle with manufacture date of 1942 or 1952 as documented by Webster et al. 2007) were observed or collected during the current investigation. No further study is recommended relative to the current Project.

5.2.3 Prospect 7.109

Proposed bedrock quarry Prospect 7.109 is situated along a series of prominent bedrock ridges north of the Bear Rock upland geologic feature, approximately 12 km northwest of Tulita. Based on the terrain and the positive results of previous AIA fieldwork in the area, four HPAs were identified within the potential prospect footprint (HPA08, HPA09, HPA10, and HPA11, illustrated in Appendix A) (Peach 2021). Two of these (HPA08 and HPA11) were defined entirely by the predefined avoidance areas surrounding previously recorded sites LgRr-2 and LgRr-3. The avoidance area for a third previously recorded archaeological site (LgRr-5) was incorporated into HPA10, which also includes a large area of previously unassessed terrain characterized by a number of parallel elevated bedrock ridges overlooking a lower lying series of small lakes to the west. The remaining HPA09 does not include any previously recorded archaeological sites, but was perceived to be high potential on the basis of proximity to known archaeological sites and terrain features (Peach 2021).

Plate 5-5 Metal jerry can found on surface at find location 2 at site LgRr-1

Due to snow cover at the time of the assessment, a thorough surface inspection could not be completed prior to initiating shovel testing. As such, the focus of the current visit was to evaluate and modify the HPAs based on ground observations and the definition of STAs. During the ground assessment of the prospect, six STAs were identified in addition to the existing avoidance areas surrounding the three previously recorded sites. The STAs vary in size, ranging from 40 m by 40 m to 165 m by 135 m. They have variously targeted east-west trending well-defined ridges and knoll tops (similar to the landforms within which the previously recorded sites were found), most of which overlook the small lakes to the west, and each is a prominent local landform in an area of high relief (Plate 5-6). Only STA05 was identified on the east side of the prospect, on a small, narrow ridge in otherwise heavily sloped terrain (Plate 5-7). In defining the size of each STA, an additional buffer was included to allow for GPS error.

None of the three previously recorded archaeological sites were revisited during the current field season, given that each includes a surface component (Heffner and Young 2020), which could not be addressed due to snow cover. Instead, it is recommended that the current avoidance areas be maintained if there are any ground disturbance activities planned prior to completion of a thorough assessment.

No further study is recommended within the footprint of Prospect 7.109 except in the three existing site avoidance areas associated with sites LgRr-2, LgRr-3, and LgRr-5, along with the newly defined STAs as illustrated in Appendix B.

A single HPA was identified along the planned access corridor leading to Prospect 7.109 (HPA12) based on the presence of an east-west trending ridge approximately mid-way between the prospect and the existing MVFL corridor. The ridge was found to be fairly well-defined in the area crossed by the access, with a pronounced drop on the south side of the landform and a more gradual decline to the north. The crest of the ridge measures approximately 10 m to 15 m in width, and there is another drop in elevation near the east edge of the investigated access buffer. Shovel test area STA11 was evaluated through the excavation of nine shovel tests to depths of approximately 25 cm on average, terminating at decaying bedrock deposits. The shovel tests were excavated in an area measuring approximately 25 m by 15 m, at intervals of between 5 m and 10 m depending largely on vegetation. None of the shovel tests yielded cultural materials and no further study is recommended for the Prospect 7.109 access as illustrated herein. Given the presence of a high potential landform, however, it is recommended that any deviation from the illustrated route be evaluated if there are modifications.

5.2.4 Prospect 8.039

The majority of proposed bedrock quarry Prospect 8.039 was perceived to be of low archaeological potential due to the apparently sloped terrain and distance from extant watercourses (Peach 2021), although a single HPA was identified comprising the bulk of the northwest corner (HPA13). Unfortunately, the nearest potential helicopter landing point was on the existing MVWR, and subsequent weather conditions precluded ground survey of the HPA. A comprehensive overflight was completed to evaluate the desktop assessment of archaeological potential.

Plate 5-6 View east along ridge targeted by STA07 in Prospect 7.109

Plate 5-7 View east along ridge targeted by STA05 in Prospect 7.109

As a result of observations made during the helicopter overflight of Prospect 8.039, a modified, larger area of high potential has been identified, due to the fact that the landform was found to be larger and more level than expected based on topographic data. The modified version of the HPA is illustrated in Appendix B. It is recommended that this area be evaluated and shovel tested as appropriate when the landform is more readily accessible. If feasible, it is recommended that a small helicopter landing pad be approved and cut in advance of future AIA fieldwork within the HPA; it is anticipated that this minimal impact would not be likely to disturb subsurface cultural materials.

Three target areas (HPA14, HPA15, and HPA16) were identified along the 1.3 km access to the proposed quarry, on the basis of topography and association with wetlands or minor drainages (Peach 2021). All three were assessed by helicopter overflight, where the land was observed to slope gently and consistently down towards the west (and the existing MVWR). No wetlands or watercourses were observed from the air along the length of the access corridor, and as a result no STAs were identified. Rather, the changes in vegetation that were previously interpreted as representative of local environment were found to be reflective of differential patterning in vegetation regrowth following forest fires some 15 to 20 years prior. No further study is recommended for the planned access to Prospect 8.039 as illustrated herein; if the route deviates from the existing trail, the new corridor should be separately evaluated.

5.2.5 Prospect 9.002

The two HPAs (HPA17 and HPA18) within the footprint of granular borrow Prospect 9.002, as currently defined, are related to an avoidance area submitted under Permit 2018-021 (Krahulic 2019), which extends into the upper valley of Little Smith Creek. The majority of each was found to be situated on the side slope of the valley, with a steady and increasing downward slope. A portion of HPA18 was found to be above the break-in-slope (Plate 5-8), however, and was assessed as STA12. The STA was defined by a well-defined drop into the broader creek valley on the north and east, and by the edges of the avoidance area to the south and west. Vegetation within the STA was dominated by dense, mixed regrowth (following forest fires) of predominantly willow, white spruce, aspen, and sparse pine. A total of 29 shovel tests were excavated, to an average depth of 30 cm, terminating at glacial till deposits. The shovel tests were excavated within an area measuring approximately 60 m by 26 m, at an average interval of approximately 5 m, impacted by the dense vegetation growth. No cultural materials were identified, and as a result no further study is recommended within Prospect 9.002.

The entirety of the access for Prospect 9.002 is within the borrow source footprint, and was perceived to be of low archaeological potential due to existing disturbance and negative assessment results under earlier permits (Peach 2021). As a result, no assessment was completed here under the current permit.

Plate 5-8 View south showing tested area STA12 in Prospect 9.002

5.2.6 Prospect 9.019

The majority of Prospect 9.019 is situated within sloped terrain, and as a result no HPAs were identified within the proposed bedrock quarry's footprint (Peach 2021). By contrast, two HPAs were targeted along the 1.7 km access corridor based on association with drainages (Peach 2021). Both were subject to a helicopter overflight assessment, and the more westerly HPA20 was also partially evaluated on the ground. The route was found to partially follow an old, overgrown and infilled trail, and to be situated within largely featureless terrain. Vegetation in the old trail is dominated by tamarack and willow, while the surrounding area featured a mix of willow, spruce, birch, and sparse pine. No well-defined features or landforms were identified, and the access was found to be sufficiently far from any well-defined drainage channels as to be considered to have low archaeological potential. As such, no STAs were defined within the access to Prospect 9.019, and no further study is recommended for the route as illustrated herein. If the final route deviates from the existing trail, the new corridor should be separately evaluated.

5.2.7 Prospect 9.025B

Targeting a high bedrock ridge, Prospect 9.025B was perceived to have high archaeological potential along the crest of a prominent landform representing the westernmost extent of a ridge of the Franklin Mountains (Peach 2021). A single large HPA was identified encompassing much of the prospect footprint, aimed at targeting the ridge top. Unfortunately, it was not possible to find a landing location within or near the prospect due to vegetation, and so a detailed ground assessment was not feasible during the current field season.

The helicopter overflight of HPA21 showed a series of parallel bedrock ridges forming the upland feature, with broad, level areas in between (Plate 5-9). Higher elevations to the southeast were noted, but sharp drops to the southwest and northwest situate the HPA firmly at the western extent of the higher and larger complex. The area is perceived to have high archaeological potential both along the ridge crests and in the broad flats between, due to the viewshed north towards a series of larger creeks and west towards the Mackenzie River. Slight changes have been made to the HPA to reflect the information gathered during the overflight, as illustrated in Appendix B. The modified HPA cuts some of the area that was observed to be sloped and/or further from the landform edges. Access to the area will continue to be problematic, however, and as such it is recommended that the cutting of a helicopter landing pad within or near to the HPA be approved prior to future completion of the AIA. This minimal impact is not expected to have a negative effect on subsurface cultural materials.

Three segments of the 2.4 km access route leading to Prospect 9.025B (HPA22, HPA23, and HPA24) were identified as having high archaeological potential during the desktop assessment, all due to possible associations with minor drainage channels (Peach 2021). The most eastern, HPA22, is the portion immediately leading up the primary landform targeted by the prospect, and is steadily and fairly steeply sloped, and appears to have low archaeological potential. Both HPA23 and HPA24 are in close proximity

Plate 5-9 View south showing Prospect 9.025B from valley to north of landform

to the existing MVWR, however, and so a ground assessment was completed. They were found to be fairly level to lightly undulating, featuring variable vegetation dominated by dense willow, black spruce, and stands of birch and aspen, with rare pine near to the MVWR. No STAs were identified in HPA23 or HPA24, largely as a result of a lack of landform definition and the predominance of vegetation suggestive of poorly drained soils. No further study is recommended along the access route to Prospect 9.025B as illustrated herein; if the final corridor deviates from this planned route, the revised access should be separately evaluated.

6 SUMMARY AND RECOMMENDATIONS

At the request of the GNWT, INF, K'alo-Stantec conducted an AIA on seven proposed quarries or borrow sources (and/or their associated access routes) associated with the upgrading of the existing MVWR into an all-season road. The Project is a component of the larger proposed Mackenzie Valley Highway Project expansion and upgrading program intended to extend the existing road from Wrigley to Norman Wells. The portion addressed under the current study includes only the activities planned within the Sahtu Settlement Area. This includes the stretch between approximately Mackenzie Valley Winter Road km point 813 and km point 990, or roughly halfway between Wrigley and Tulita to halfway between Tulita and Norman Wells. The AIA was conducted under Northwest Territories Class 2 Archaeology Permit 2020-022.

The scope of work within the AIA was agreed to by the Culture and Heritage Department of Education, Culture, and Employment during the permit application process, and was based on the 2021 Archaeological Overview Assessment of a wider selection of prospective bedrock quarries and granular borrow sources along the full length of the highway upgrade project.

Within the seven proposed quarries or borrow sources, including (as applicable) their access corridors, addressed by the current study, a total of 24 HPAs were identified within the project scope. These include:

- Prospect 7.083 and its associated access (six HPAs)
- Prospect 7.090 (one HPA)
- Prospect 7.109 and its associated access (five HPAs)
- Prospect 8.039 and its associated access (four HPAs)
- Prospect 9.002 (two HPAs)
- Access to Prospect 9.019 (two HPAs)
- Prospect 9.025B and its associated access (four HPAs)

The fieldwork was completed between September 27 and October 2, 2021. The fieldwork was completed by a field crew consisting of two K'alo-Stantec archaeologists and two local community members from Tulita, Stephanie McCauley and Jonathan Yakeleya, as coordinated by Tamara Bernarde-Baton of the Tulita Renewable Resources Council. The assessment consisted of combined helicopter and ground survey, supplemented by shovel testing in areas with high archaeological potential and minimal surface exposure.

During the study, 116 shovel tests were excavated (Appendix A). No archaeological sites were newly recorded, although previously recorded historic campsite LgRr-1 was revisited and evaluated. No traditional land use sites were recorded. Shovel tests were excavated at the following areas:

- Three shovel test areas in Prospect 7.083
- Two shovel test areas on access to Prospect 7.083
- One shovel test area on access to Prospect 7.109
- One shovel test area in Prospect 9.002

Due to field access and weather conditions, it was not possible to complete the ground assessment at three of the investigated areas, including prospects 7.109, 8.039, and 9.025B. However, all three were subject to either limited ground survey or helicopter overflight. As a result of this assessment, it was possible to identify six shovel test areas in Prospect 7.109, and to modify the high potential areas in prospects 8.039 and 9.025B (Appendix B). Also, the access corridors for these three locations were evaluated and no further study is recommended for the planned routes as illustrated herein. Based on the results of the assessment, no further study is recommended at prospects 7.083, 7.090, 9.002, and 9.019, including their associated access as illustrated herein (Appendix B).

Respectfully Submitted,

K'ALO-STANTEC LIMITED

Original signed by

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Appendix A Ground Reconnaissance Mapset

H:\External Proj\K Centre\144 BC\144903206\mxd\01\2021-022\144903206_GroundReCon_V2.mxd Revised: 2022-01-04 By: bsorensen

355000

7230000

STA02
12 Negative ST

HPA01

STA03
12 Negative ST

STA04
34 Negative ST

7.083

HPA02

HPA03

355000

7230000

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

AIA Shovel Testing Area

Tracks

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

AOA Archaeological Potential (Peach 2021)

Low (No Further Work Recommended)

High (Further Work Recommended)

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
   Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project Location
Central NWT

14490320 6

Prepared by BSorensen on 2021-12-09

Client/Project

Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway Extension Project – AOA of Prospect Borrow Sources

Page No.

1

Title

Prospect Deposit Area Archaeological Potential Prospect 7.083

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350000

355000

HPA03

STA13
11 Negative ST

STA01
9 Negative ST

HPA05

HPA04

Vermillion Creek

HPA06

7225000

350000

355000

0 250 500

Meters

1:20,000 (at original document size of 8.5x11)

AIA Shovel Testing Area

Tracks

Proposed Access Road

Proposed Access Road Buffer

AOA Archaeological Potential (Peach 2021)

Low (No Further Work Recommended)

High (Further Work Recommended)

Mackenzie Valley Winter Road

Notes
1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Project: Mackenzie Valley Highway Extension Project – AOA of Prospect Borrow Sources

Page No.
2

Title
Prospect Deposit Area Archaeological Potential Prospect 7.083 Access

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360000

7215000

Jungle Ridge Creek

Jungle Ridge Creek

7.090

HPA07

LgRr-1

- Archaeological Site
- Tracks
- Proposed Access Road
- Proposed Access Road Buffer
- Bedrock Quarry

AOA Archaeological Potential (Peach 2021)

- Low (No Further Work Recommended)
- High (Further Work Recommended)

- Mackenzie Valley Winter Road

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
   Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project: Mackenzie Valley Highway Extension Project – AOA of Prospect Borrow Sources

Page No.

3

Title

Prospect Deposit Area Archaeological Potential Prospect 7.090

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370000

HPA08
HPA09
7.109
LgRr-2
HPA10
STA05
STA09
STA06
STA07
STA08
LgRr-5
STA10
HPA11
LgRr-3
STA11
9 Negative ST
HPA12
LfRr-6
LfRr-7

370000

- Archaeological Site
- AIA Shovel Testing Area
- Tracks
- Proposed Access Road
- Proposed Access Road Buffer
- Bedrock Quarry

AOA Archaeological Potential (Peach 2021)

- Low (No Further Work Recommended)
- High (Further Work Recommended)
- Mackenzie Valley Winter Road

0 250 500
Meters
1:15,000 (at original document size of 8.5x11)

Kálo-Stantec

Project Location
Central NWT

144903206
Prepared by BSorensen on 2021-12-09

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway Extension Project – AOA of Prospect Borrow Sources

Page No.
4

Title
Prospect Deposit Area Archaeological Potential Prospect 7.109

Notes
1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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420000

7160000

HPA13

8.039

HPA14

HPA15

HPA16

420000

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

Tracks

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

AOA Archaeological Potential (Peach 2021)

Low (No Further Work Recommended)

High (Further Work Recommended)

Mackenzie Valley Winter Road

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Project Location
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Project: Mackenzie Valley Highway Extension Project – AOA of Prospect Borrow Sources

Page No.

5

Title

Prospect Deposit Area Archaeological Potential Prospect 8.039

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415000

420000

71 45000

LcRo-7

Little Smith Creek

Little Smith Creek

LcRo-3

LcRo-5

LcRo-6

LcRo-8

Mackenzie River

HPA17

HPA18

STA12
29 Negative ST

AIA

9.002

Archaeological Site

AIA Shovel Testing Area

Tracks

Proposed Access Road

Proposed Access Road Buffer

Granular Supply

AOA Archaeological Potential (Peach 2021)

Low (No Further Work Recommended)

High (Further Work Recommended)

Mackenzie Valley Winter Road

0 250 500 1000

Meters

1:15,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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6

Title

Prospect Deposit Area Archaeological Potential Prospect 9.002

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435000

435000

0 250 500

Meters

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Tracks

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

AOA Archaeological Potential (Peach 2021)

Low (No Further Work Recommended)

High (Further Work Recommended)

Mackenzie Valley Winter Road

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
   Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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7

Title

Prospect Deposit Area Archaeological Potential Prospect 9.019

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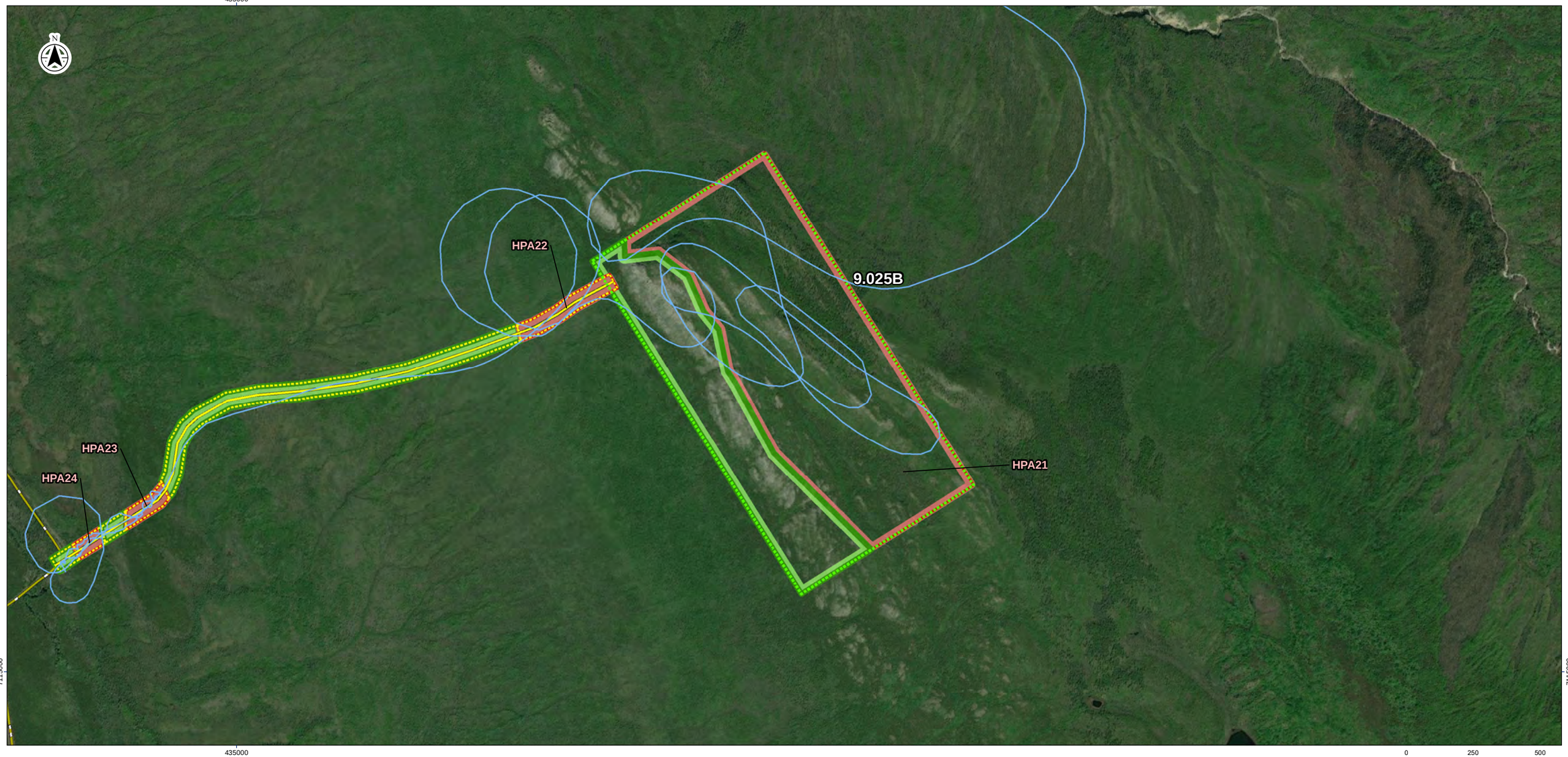
435000



435000

Tracks

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

AOA Archaeological Potential (Peach 2021)

Low (No Further Work Recommended)

High (Further Work Recommended)

Mackenzie Valley Winter Road

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

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Page No.

8

Title

Prospect Deposit Area Archaeological Potential Prospect 9.025B

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Appendix B Mapset of Post-AIA Recommendations

H:\External Profit Centres\144 BC\144903206\mxd\10\2021-0221-144903206_Recommendations_v5.mxd Revised: 2021-12-23 By: bsorensen

355000

7230000

355000

7230000

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

Recommendations Following Completion of AIA

No Further Work Recommended

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Page No.
1

Title

Prospect Deposit Area AIA Recommendations Prospect 7.083

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350000

355000

7225000

Vermillion Creek

Recommendations Following Completion of AIA

No Further Work Recommended

Proposed Access Road

Proposed Access Road Buffer

Mackenzie Valley Winter Road

0 250 500

Meters

1:20,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits Source: Esri, Maxar, Geolye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
   Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Page No.

2

Title

Prospect Deposit Area AIA Recommendations Prospect 7.083 Access

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360000

7215000

360000

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

Archaeological Site

Recommendations Following Completion of AIA

No Further Work Recommended

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

Mackenzie Valley Winter Road

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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3

Title

Prospect Deposit Area AIA Recommendations
Prospect 7.090

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370000

7.109

LgRr-2

LgRr-5

LgRr-3

LfRr-6

LfRr-7

370000

Archaeological Site

Recommendations Following Completion of AIA

Further Work Recommended

No Further Work Recommended

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

Mackenzie Valley Winter Road

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Prospect Deposit Area AIA Recommendations
Prospect 7.109

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Recommendations Following Completion of AIA

- Further Work Recommended
- No Further Work Recommended

- Proposed Access Road
- Proposed Access Road Buffer
- Bedrock Quarry

- Mackenzie Valley Winter Road

0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

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5

Title

Prospect Deposit Area AIA Recommendations
Prospect 8.039

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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415000

420000

71.45000

LcRo-7

Little Smith Creek

LcRo-3

LcRo-5

LcRo-6

LcRo-8

Mackenzie River

9.002

415000

0 250 425000

Meters

1:15,000 (at original document size of 8.5x11)

Archaeological Site

Recommendations Following Completion of AIA

No Further Work Recommended

Proposed Access Road

Proposed Access Road Buffer

Granular Supply

Mackenzie Valley Winter Road

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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6

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Prospect Deposit Area AIA Recommendations Prospect 9.002

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435000

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0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

Recommendations Following Completion of AIA

No Further Work Recommended

Proposed Access Road

Proposed Access Road Buffer

Bedrock Quarry

Mackenzie Valley Winter Road

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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7

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Prospect 9.019

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435000

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0 250 500

Meters

1:15,000 (at original document size of 8.5x11)

Recommendations Following Completion of AIA

- Further Work Recommended
- No Further Work Recommended

- Proposed Access Road
- Proposed Access Road Buffer
- Bedrock Quarry

- Mackenzie Valley Winter Road

Notes

1. Coordinate System: NAD 1983 UTM
2. Source: CanVec produced Natural Resources Canada; ArcticDEM; Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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Page No.

8

Title

Prospect Deposit Area AIA Recommendations Prospect 9.025B

Appendix C Field Notes

Appendix D Artifact Catalogue

Appendix E Photo Log