



February 2013

ARCHAEOLOGICAL IMPACT ASSESSMENT

Prairie Creek Mine Access Road Alignment Changes

Submitted to:

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FINAL REPORT



Report Number: 12-1333-0022 / NWP 2012-016

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EXECUTIVE SUMMARY

During September of 2012 Golder Associates Ltd. conducted an Archaeological Impact Assessment on behalf of Canadian Zinc Corporation of changes to their Prairie Creek Mine Access Road Alignment near Nahanni Butte, NWT. The study included the assessment of the proposed Nahanni Range Alternative (56.2 km) winter road. The alternative road travels from just northeast of the community of Nahanni Butte north along the Nahanni Front Range to Grainger Gap where it meets up with the existing winter road. The current winter road was used by the past owner of the mine in the 1980s and subject to an archaeological assessment in 2009. All required field work was conducted under NWT Archaeologist's Permit 2012-016 issued by the Prince of Wales Northern Heritage Centre to Brent Murphy of Golder Associates Ltd.

The field investigation was completed on September 20 and 21, 2012. The objectives of the Archaeological Impact Assessment were to identify record and assess heritage resources that might be impacted by the proposed winter road and to devise appropriate mitigation strategies should any be found in conflict with the proposed winter road alignment. The archaeological sites may include previously unrecorded sites within or adjacent to the proposed right of way, temporary workspace and/or borrow areas, if relevant.

The field assessment was planned in conjunction with Elders and community members in Nahanni Butte prior to the field studies. Although the meetings were informal several community members and Elders were consulted about the project and provided input into the project design. The field studies included the participation of Wilbert Antoine from Canadian Zinc Corporation and Peter Marcellais and Elder Leon Konisenta from the community of Nahanni Butte.

The field studies include low and slow helicopter over flights as well as some pedestrian survey. The results of the assessment were that no new historic resource sites were recorded or revisited. By conducting the Archaeological Impact Assessment it is recommended that Canadian Zinc Corporation have fulfilled the requirements of the current program in their attempt to identify the potential for impact to heritage resources resulting from the proposed Nahanni Range Alternative winter access road.



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PRAIRIE CREEK MINE AIA - FINAL

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1.0 INTRODUCTION

1.1 Background

On behalf of Canadian Zinc Corporation (Canadian Zinc), Golder Associates Ltd. (Golder) conducted an Archaeological Impact Assessment (AIA) of their Prairie Creek Mine Access Road alignment (the Project) in the Deh Cho Region of NWT. The AIA included the assessment of the proposed Nahanni Range Alternative (56.2 km) winter road. The alternative road is proposed to begin at the end of an existing logging road located just northeast of the community of Nahanni Butte and would extend north along the Nahanni Front Range to Grainger Gap where it meets the existing winter road (Figure 1). All required field work was conducted under NWT Archaeologist's Permit 12-016 issued to Brent Murphy of Golder by the Prince of Wales Northern Heritage Centre (PWNHC).

The field investigation of the AIA was completed on September 20 and 21, 2012. The objectives of the AIA were to identify, record and assess heritage resources that might be impacted by the proposed winter road and to devise appropriate mitigation strategies should any be found in conflict with the proposed winter road alignment. Archaeological sites may include previously unrecorded sites within or adjacent to the proposed right of way, temporary workspace and/or borrow areas, if relevant. Heritage resources typically identified in the area include prehistoric isolated finds, camp sites and trading posts.

The field assessment was planned in conjunction with Elders and community members in Nahanni Butte prior to the field studies. Although the meetings were informal several community members and Elders were consulted about the Project and provided input into the project design. The field studies included low and slow helicopter over flights as well as some pedestrian survey and included the participation of Wilbert Antoine from Canadian Zinc Corporation and Peter Marcellais and Elder Leon Konisenta from the community of Nahanni Butte who assisted during the field program and provided advice on the cultural significance of the landscape traversed during the investigation.

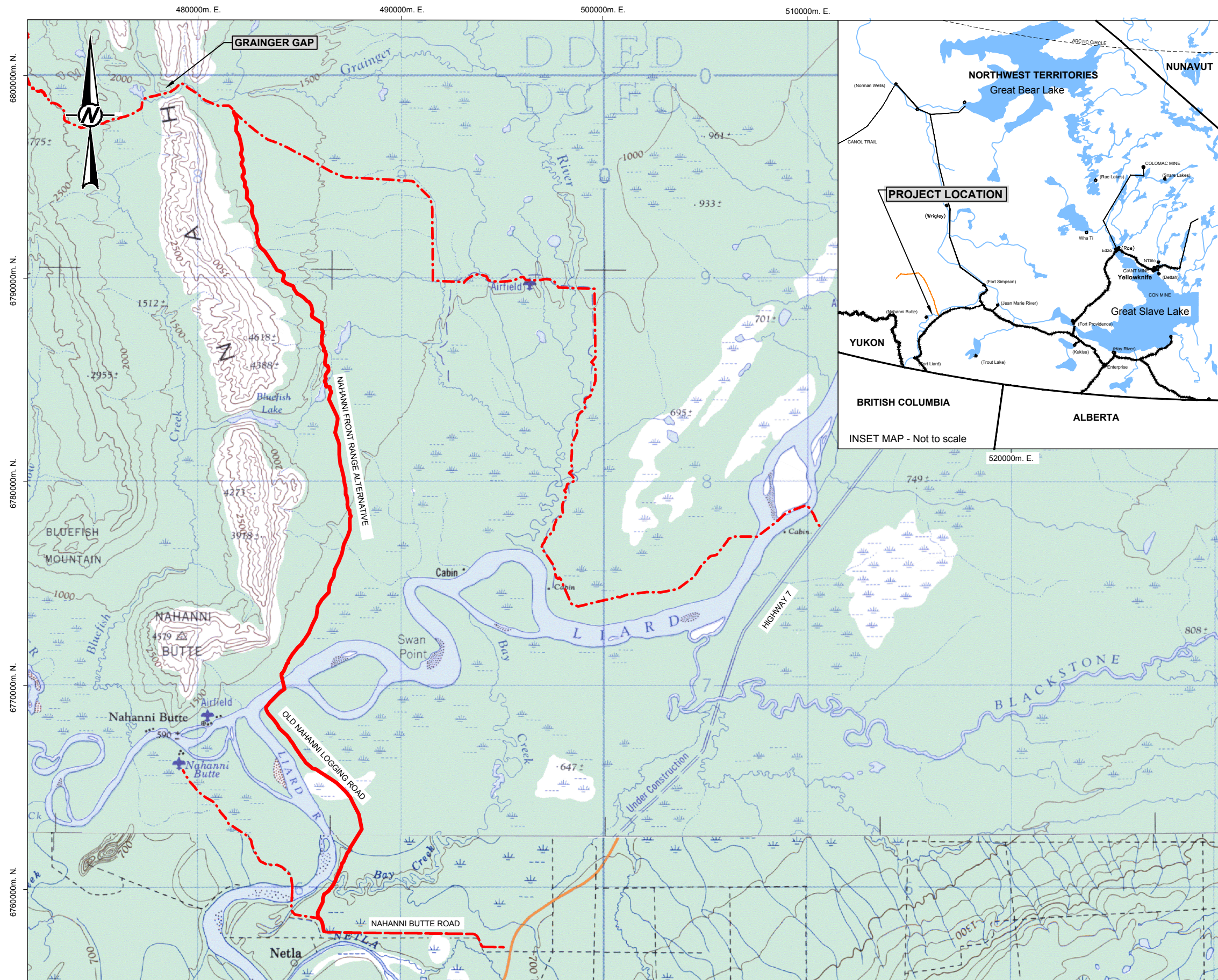
1.2 Relevant Terminology and Regulations

Terms and regulations applicable to this AIA and used in this report are defined below.

Pursuant to the *Northwest Territories Act*, the *Northwest Territories Archaeological Sites Regulations* (GNWT 2001) were developed to protect heritage resources throughout the Northwest Territories (NWT) and provide the following definitions:

- *"archaeological artifact" means any tangible evidence of human activity that is more than 50 years old, in respect of which an unbroken chain of possession cannot be demonstrated.*
- *"archaeological site" means a site where an archaeological artifact is found.*
- *"Class 2 permit" means a permit that entitles the permittee*
 - a) *to survey and document the characteristics of an archaeological site;*
 - b) *to excavate an archaeological site;*
 - c) *to remove archaeological artifacts from an archaeological site; or*
 - d) *to otherwise alter or disturb an archaeological site.*

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LEGEND

- ACCESS ROAD
- EXISTING WINTER ROAD
- NAHANNI BUTTE ROAD

REFERENCE

TOPOGRAPHIC MAP 95B AND 95G, OBTAINED FROM SoftMap. © 1985 AND 1979 HER MAJESTY THE QUEEN IN RIGHT OF CANADA. DEPARTMENT OF NATURAL RESOURCES. ALL RIGHTS RESERVED. DATUM: NAD83 PROJECTION: UTM ZONE 10



PROJECT		CANADIAN ZINC CORP. PRAIRIE CREEK MINE	
TITLE		PROJECT LOCATION ACCESS ROAD ALIGNMENT	
PROJECT No. 121333.0022.8470		FILE No. 12133300228470A001	
DESIGN	BM	2012-11-16	SCALE
CADD	TV	2012-11-16	SCALE
CHECK	BM	2013-02-12	FIGURE 1
REVIEW	GC	2013-02-12	





With respect to Crown Lands in the Deh Cho Region, pursuant to the *Territorial Lands Act (TLA)*, the *Territorial Land Use Regulations (TLA 2003)* were developed. Two sections contained therein are applicable to this AIA as they outline the restrictions placed on developers through the requirement of a Land Use Permit system to ensure that archaeological sites are not impacted during operations:

- 10 (a) *No permittee shall, unless expressly authorized in his permit or expressly authorized in writing by an inspector conduct a land use operation within 30 metres of a known monument or a known or suspected archaeological site or burial ground; and*
- 16. *Where, in the course of a land use operation, a suspected archaeological site or burial ground is unearthed or otherwise discovered, the permittee shall immediately:*
 - a) *suspend the land use operation on the site; and*
 - b) *notify the engineer or an inspector of the location of the site and the nature of any unearthed materials, structures or artifacts.*

1.3 Potential Impacts

Construction activities associated with the winter road have the potential to impact heritage resources within the Project area. Surface features such as tent rings, caches, cairns, burials and historic structure may be impacted by heavy vehicular traffic. Snow clearing and / or grading can impact buried sites such as campsites and semi subterranean house pits. Once impacted, archaeological sites may lose value because artifacts and features may be displaced, damaged, and / or destroyed, which may result in the loss of contextual information or complete loss of heritage information. Losses in heritage resources are permanent and irreversible. Primary, secondary and tertiary impacts are possible with any development.

Primary impacts include those disturbances resulting immediately from and during planned construction activities. The primary impact zone will be the winter road right-of-way (ROW) and the construction activities will include vegetation removal and snow clearing and the weight of heavy equipment may be sufficient to compress soil strata within the work area resulting in impact to any buried artifacts and features. Individual sites are likely to be affected to varying degrees depending upon where they are located within the proposed areas of impact.

Secondary impacts are indirect impacts that can occur during or after construction is complete. These impacts may include erosion of sloping terrain due to alterations in the vegetation and soils composition which may affect sites along the periphery of previously impacted areas.

Tertiary impacts are the results of changes in land use patterns induced by the development. Given the nature of the Project, it is possible that the development of the winter road will allow for changes in land use in some areas due to increased access. Intentional and unintentional impacts to heritage resources can result from increased visitation to specific areas within the region.

The approaches developed for the AIA were designed to develop strategies to mitigate any potential impacts to heritage resources that could result from construction of the winter road.



2.0 OBJECTIVES

AIA's for projects of this nature are conducted as required by the Government of the Northwest Territories according to the requirements set out in the *Northwest Territories Archaeological Sites Regulations* and the Guidelines for Developers for the Protection of Archaeological Sites in the Northwest Territories issued by the PWNHC. AIA's are conducted in advance of development to ensure that any heritage resources present are identified and properly managed. The primary objectives of this study were to:

- identify and evaluate archaeological and cultural resources within the winter road ROW;
- assess the significance of any sites identified;
- assess potential development impacts to any heritage resources identified; and
- recommend viable measures for managing potential adverse effects.

This report provides a description of the program adopted to achieve these objectives, as well as its results.

3.0 METHODS

3.1 Pre-Field Studies

To identify areas of possible archaeological concern, several data sources were reviewed before fieldwork began. Archaeological site records maintained by the PWNHC and Archaeological Survey of Canada in Ottawa were examined as part of the background to the study. A review of general environmental information for the region was conducted to provide a context for the field work that followed and National Topographic Series (NTS) maps of the Project area were also examined to determine the nature of landforms in the region. Previously conducted archaeological studies for the region were also consulted.

3.2 In-Field Studies

The field investigation of the AIA was completed by performing systematic pedestrian surface reconnaissance and sub-surface test exploration to identify any archaeological sites and traditional land use areas (TLAs) in the Project area. Pedestrian surface reconnaissance is the most common method used by archaeologists to identify archaeological sites within a project area (Ruppé 1966), where the ground is visually inspected. Visual inspection is particularly effective in areas where there is limited soil development and sparse vegetation, i.e., where vision of the soil surface is unobstructed (Schiffer *et al.* 1978). This facilitates the detection of artifacts and / or formations on the ground surface. All subsurface exposures present within the area, including natural exposures, were examined to determine the potential for buried cultural components. Existing disturbances such as eroding slopes were also examined if it appeared that they might aid in the identification of buried cultural components within the proposed areas of impact. In areas where there were no existing exposures and/or where dense vegetation was present, judgmental shovel tests were excavated to determine the potential for buried heritage resources (Krakker *et al.* 1983; Kintigh 1988). Shovel tests are essential in the determination of the integrity, dimensions and density of cultural materials, or lack thereof, in a project area (Kintigh 1988).

A helicopter-assisted pedestrian assessment was carried out by a team of three (archaeologist, Canadian Zinc representative and local community member). The entire Project ROW was overflown and inspected by a low and slow flying aerial inspection. Areas that were considered to have potential were then subject to pedestrian survey.



For the purposes of artifact conservation, Golder retained the services of a conservator in the event any heritage resources were found during the investigation.

4.0 STUDY AREA

The study area for the field AIA consisted of the entire Nahanni Front Range Alternative portion of the winter road ROW (Figure 1). The alternative road is approximately 56.2 km long and uses the existing Old Nahanni Logging Road from Nahanni Butte Road until it reaches the north side of the Liard River (Plate 1 and 2). From the north side of the Liard River the winter road will consist of a new ROW (Plate 3 and 4) until it reaches the original winter road to the mine just east of Grainger Gap (Plate 5). The original winter road between the Liard Highway and the Prairie Creek Mine was subject to an AIA in 2009 (Prager 2009). The 2009 assessment investigated the previous winter road to the mine that was used for two years in the 1980s by the former owners.



Plate 1: View northwest of the Old Nahanni Logging Road.



Plate 2: View across Liard River at proposed crossing location with logged area below.



Plate 3: View northeast of north side of Liard River crossing. There is an overgrown cut line in the right of the photograph.



Plate 4: View north along proposed winter road showing change in vegetation at higher altitude. The Granger Gap can be seen in the background.



Plate 5: View west of Grainger Gap, winter road can be seen on the south side of the drainage.



4.1 Boundaries

The *Northwest Territories Archaeological Sites Regulations* and the *Territorial Land Use Regulations* (Section 1.2) identify that no authorized land use shall be undertaken "...within 30 metres of a known monument or a known or suspected archaeological site or burial ground." As such, this AIA focused on areas within 30 m on either side of the ROW centreline, and within areas considered to be of medium to high potential for heritage resources. Additionally, some level and dry banks, terraces and benches outside of the 30 m periphery of the ROW were investigated.

5.0 RESULTS

5.1 Pre-Field Studies

Prior to field studies a search of the archaeological site records maintained by the PWNHC and Archaeological Survey of Canada in Ottawa was conducted and previously conducted archaeological studies for the region were consulted. This helped to identify the types of archaeological sites that could be expected in the area and the nature of previous research. No previously documented archaeological sites exist within the Project ROW, but four, JgRu 1, 2, 3 and 4, have been recorded within 5 km of the Project area (Table 1).

Table 1: Archaeological Sites Within 5 km of the Project

Site Name	Location	Distance to Highway	Type	Features
JgRu 1 Chimney Point Site	Bank of the South Nahanni River	2.4 km	Trader's cabin, historic/ prehistoric campsite	Remains of buildings (chimneys, stone foundations, and pits) and prehistoric tool recovered nearby
JgRu 2	Bank of the South Nahanni River	4.4 km	Isolated find	A chert biface was recovered
JgRu 3	Bank of the South Nahanni River	1.9 km	Campsite	Bone flesher, hearth and faunal remains
JgRu 4	Bank of the South Nahanni River	3.3 km	Artifact scatter	Two lithic flakes were recovered

JgRu 1, the Chimney Point site, was recorded near the confluence of the South Nahanni and Liard rivers and consists of three rock and rubble mounds (fallen chimneys) each adjacent to a large pit. Five additional pits suggesting more structures and a recent fireplace were also noted. The buildings were interpreted to have been occupied during the last two decades of the 19th century and may relate to early trading activities. A single lithic biface was also recovered on the beach at this location.

JgRu 2 and JgRu 4 are both prehistoric sites. JgRu 2 is an isolated find site located approximately 2 km upstream from JgRu 1 on the left bank of the South Nahanni River. A single complete chert biface was recovered in the backdirt of a construction excavation. JgRu 4 was recorded as two lithic flakes recovered from a high truncated terrace overlooking the left bank of the South Nahanni River approximately 850 m upstream from JgRu 1.



JgRu 3 is a more recent campsite on a dissected terrace overlooking the left bank of the Liard River approximately 600 m downstream from JgRu 1. Although there were no surface features a moose metapodial flesher, a hearth and bone refuse were uncovered in test pits. This site was interpreted as falling somewhere in the early to recent historic periods.

All four sites were recorded by Parks Canada during two archaeological assessments aimed at documenting cultural remains in Nahanni National Park, concentrating on the South Nahanni drainage system (Amsden 1977 and 1978). The only other assessment in the Project area was the 2009 investigation of the Canadian Zinc Prairie Creek Mine Access Road (Prager 2009). The 2009 assessment investigated the previous winter road to the mine that was used for two years in the 1980s by the former owners. There were no new archaeological sites recorded or revisited during the 2009 study (Prager 2009).

5.2 Field Investigation

The field assessment was planned in conjunction with Elders and community members in Nahanni Butte prior to the field studies. Although the meetings were mostly informal several community members and Elders were consulted about the Project and provided input into the project design. Prior to field studies the author and Wilbert Antoine of Canadian Zinc discussed the Project with community Elders Leon Konisenta, Raymond Vital and Francis Betsaka, as well as Chief Clayton Konisenta and community members Peter Marcellais, Loraine Vital, Tammy Matou, Joan Ekotla, Jane Konisenta and Archie Betsaka (Plate 6).



Plate 6: Wilbert Antoine going over Project maps with Francis and Archie Betsaka.



During the consultation, there were no known sites identified within the Project ROW, however, several people suggested that the north bank of the Liard River would be the good place to camp. Elder Raymond Vital has camps on the Liard River (north of the Project crossing) Bluefish Lake and Grainger Gap and has trapped in the area all of his life. Mr. Vital suggested that Bluefish Lake would be the best location, that is close to the study area, for a place that people would have camped in the past. Mr. Vital also mentioned that he uses a trail between his camp on the Liard River and Bluefish Lake that is based on an old dogsled trail that will cross the Project ROW.

The field studies included low and slow helicopter over flight and some pedestrian survey. The entire Project ROW was examined from the air and pedestrian survey was focused on the proposed crossing of the Liard River (Plate 7). The field studies included the participation of Wilbert Antoine from Canadian Zinc Corporation and Peter Marcellais and Elder Leon Konisenta from the community of Nahanni Butte. Peter Marcellais participated on the flyover and Leon Konisenta piloted the boat that was used to access the crossing of the Liard River.



Plate 7: View north of proposed Liard River crossing. North bank is in the middle of the photo at the base of the scree slope.



The results of the assessment were that no new historic resource sites were recorded or revisited; however, two traditional land use locations, both trails, were noted but not officially recorded as they do not meet some or all of the criteria required to be designated as an archaeological site under the *Northwest Territories Archaeological Sites Regulations* (GNWT 2001). On the north side of the Liard River, the ROW briefly follows an overgrown cut line that is maintained by Raymond Vital who uses it in the winter as a snowmobile trail for a short distance (Plate 8). Leon Konisenta mentioned that the cut line was left over from a seismic program that took place in the early 60s. The second recent trail is a hand cut trail that bisects the Project ROW north of the cut line that was most likely cut to retrieve game with a snowmobile as evidenced by a piece of plywood that was thought to have been the side of a snowmobile sled left at the end of the trail (Plate 9).

During the assessment, the trail that Raymond Vital described between his camp on the Liard River to Bluefish Lake was not located or visited. Originally Mr. Vital was going to participate in the survey but had to cancel due to prior commitments.



Plate 8: View northeast of Wilbert Antoine walking along cut line on the north side of the Liard River.



Plate 9: Plywood from the side of a snowmobile sled.

6.0 SUMMARY AND MANAGEMENT RECOMMENDATIONS

On behalf of Canadian Zinc, Golder conducted an AIA of changes to their Prairie Creek Mine Access Road Alignment in the Deh Cho Settlement Region of NWT. The AIA was conducted under NWT Archaeologists Permit #2012-016 issued to Brent Murphy. The assessment was conducted on the proposed Nahanni Range Alternative (56.2 km) winter road. The alternative road travels from just northeast of the community of Nahanni Butte north along the Nahanni Front Range to Grainger Gap where it meets up with the previous winter road (Figure 1). The field assessment was planned in conjunction with Elders and community members in Nahanni Butte and was completed on September 20 and 21, 2012. The field studies included low and slow helicopter over flights as well as some pedestrian survey and included the participation of Wilbert Antoine from Canadian Zinc Corporation and Peter Marcellais and Elder Leon Konisenta from the community of Nahanni Butte who assisted during the field program and provided advice on the cultural significance of the landscape traversed during the investigation.

No new archaeological sites were recorded as a result of the investigation and no sites will be directly impacted by the proposed winter road alignment change. **As a result, it is recommended that Canadian Zinc Corporation have fulfilled the requirements of the current program in their attempt to identify the potential for impact to heritage resources resulting from the proposed Nahanni Range Alternative winter access road. Should any of the plans associated with winter road change and alternate routes be proposed, additional investigations may also be warranted. These recommendations are subject to PWNHC approval.**



Report Signature Page

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