Denison Mines

Wheeler River Project

Final Environmental Impact Statement

November 2024

Powering
PEOPLE, PARTNERSHIPS AND PASSION.

Denison Mines Corporation
Wheeler River Uranium Project
Heritage Resources Management Plan

Report

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Project No. 3402

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1.0 INTRODUCTION

The Wheeler River Uranium Project (the Project) is an advanced exploration project owned by Denison Mines Corp. (Denison) at 90% and JCU (Canada) Exploration Company Ltd. (JCU) at 10%. Exploration activities began in the late 1970s. Denison became the operator of the joint venture in 2004. Denison completed the *Prefeasibility Study Report* for the Project in 2018 and the *Provincial Technical Proposal and Federal Project Description* in 2019. A joint federal-provincial Environmental Impact Assessment (EIA) will be conducted; thus, a single Environmental Impact Statement (EIS) will be submitted to both the Saskatchewan MOE's Environmental Assessment and Stewardship branch and the Canadian Nuclear Safety Commission (CNSC).

This Heritage Resources Management Plan (HRMP) has been developed to guide Denison if archaeological artifacts, features, or human remains (and suspected human remains) are identified within the Project development footprint during all stages of the Project. As Heritage Resources have been identified within the Project area during previous Heritage Resource Impact Assessments (HRIAs) and Indigenous Knowledge (including Traditional Land Use Studies) show past and continued use of the Project area, it suggests that there is further potential to find Heritage Resources during future activities.

As Heritage Resources have been identified within the Project area during previous Heritage Resource Impact Assessments (HRIAs) and Indigenous Knowledge (including Traditional Land Use Studies) show past and continued use of the Project area, it suggests that there is further potential to find Heritage Resources during future activities. The HRMP will serve as a guide to follow if archaeological artifacts, features, or human remains (and suspected human remains) are identified within the Project development footprint during all stages of the Project. Despite best efforts, unidentified Heritage Resources may be in located within the Project and may be unintentionally disturbed and discovered during activities associated with the Project, such as during construction. Heritage Resources are not only protected under provincial legislation but are non-renewable and are important for the scientific reconstruction of ancient and past lifeways. This report includes the regulatory context, the project background, the archaeological background that will inform the HRMP.

2.0 REGULATORY CONTEXT

Heritage Resources in Saskatchewan are Provincially legislated and protected under *The Heritage Property Act* (Government of Saskatchewan 1980) and all Heritage Resources identified on public, provincially owned, or private land, fall under its protection. Federal lands (including national parks, national historic sites, and First Nations reserve lands) are regulated by the Federal Government and are, therefore, outside of the jurisdiction of *The Heritage Property Act*. Legislation in Saskatchewan will be discussed below. For the purposes of the HRMP, the following definitions as outlined in *The Heritage Property Act* will be used (Government of Saskatchewan 1980; GS 2003):

- Heritage Property: any archaeological object, any palaeontological object, any property that is of interest for its architectural, historical, cultural, environmental, archaeological, palaeontological, aesthetic or scientific value, and any site where any object or property mentioned above is or may reasonably be expected to be found.
- Archaeological object: any object showing evidence of manufacture, alteration or use by humans that is found in or taken from land in Saskatchewan and that is of a value for the information that it may give on prehistoric or early historic human activity in Saskatchewan.
- Paleontological object: a fossil of a vertebrate animal or a macroscopic fossil of an invertebrate animal or plant that lived in the geological past, but does not include:
    - A fossil fuel or fossiliferous rock intended for industrial use; or
    - Any form in addition to those mentioned in subclause (a), of a preserved remain or trace of a multicellular organism that may be prescribed in the regulations.
- Site: any parcel of land or remains of any building or structure.

2.1 Heritage Property Act

In Saskatchewan, Heritage Resources include Precontact period and Historic period archaeological sites, built heritage sites and structures of historical and/or architectural interest, and paleontological sites. According to Section 5(63) (1), if an operation or activity

may result in the alteration, damage, or destruction of heritage property than the person/company may have to:

- carry out an impact assessment to determine the effect of the proposed operation or activity on the heritage property,
- prepare and submit a report to the government summarizing the assessment, and
- undertake any salvage, preservation or protective measures that the minister may require (Government of Saskatchewan 1980).

The third bullet listed above is especially important in regards to the HRMP. These investigations must be carried out by qualified personnel who have been issued an Archaeological Resource Investigation Permit or a Palaeontological Resources Investigation Permit by the Heritage Conservation Branch. The permit holder is responsible for the completion of the assessment, the reporting, and the delivery of artifacts to the Royal Saskatchewan Museum (RSM). All artifacts must be stored at the RSM unless other arrangements are made with the RSM.

In Saskatchewan, both palaeontological and archaeological objects are the property of the Crown (Government of Saskatchewan 1980). If an object was collected prior to November 28th, 1980, then the person should register the object with the government, and the person may be able to maintain ownership of the object (Government of Saskatchewan 1980 Section 5[66.2]). It is illegal to sell, buy, trade, etc. any heritage object found on or taken from land in Saskatchewan (Government of Saskatchewan Section 5 (7)). Any person who identifies a heritage object or site without a permit has 15 days to notify the Government (Government of Saskatchewan 1980 Section 5[71]). This will be discussed under the Chance Finds policy outlined in the HRMP (see section 5.2.2).

Sites of Special Nature (SSN) are offered explicit protection under Section 64 of *The Heritage Property Act* (Government of Saskatchewan 1980). SSN include pictographs, petroglyphs, human skeletal material, burial object, burial place or mound, boulder effigy or medicine wheel (Government of Saskatchewan 1980 Section 5[64]). These sites cannot be altered or moved, and in general must be avoided by development. Additional measures have been outlined in The Archaeological Burial Management Policy in regard to human remains (GS 2003).

2.2 The Archaeological Burial Management Policy

Archaeological burials (including burials, burial places, burial mounds and human skeletal materials) are human remains that are not located in cemeteries recognized under *The Cemeteries Act* and are not under the jurisdiction of criminal investigations (GS 2010).

The Archaeological Burial Management Policy has four steps (GS 2010):

- Discovery and Notification
    - Upon identification of human remains all work must immediately be stopped in the vicinity of the discovery.
    - Unless the burial is in a clear archeological context (i.e. with artifacts) the RCMP (or other appropriate law enforcement) must be notified.
    - The Heritage Resources Branch shall be notified.
- Assessment
    - Within 48 hours it will be determined if the human remains are a police matter or an archaeological matter.
    - If the remains are archaeological then the cultural affiliation must be determined and all applicable interest groups will be advised of the discovery and consulted.
- Preservation or Removal
    - It will be determined if the burial should be removed and relocated (often due to risk of imminent destruction) or preserved in situ.
- Final Disposition
    - If the burial must be removed from its original location the final step will be reburial in an appropriate location in consultation with the appropriate interest groups.

If suspected human remains are identified, the above steps must be followed until their identification is confirmed.

2.3 Heritage Resource Review

Heritage Resource Reviews (HRRs) are completed by the Heritage Conservation Branch (HCB) for proposed projects that are likely to affect Heritage Resources. The HCB has identified two primary triggers for determining if a Heritage Resource Impact Assessment (HRIA) is required for a project (per section 63 of *The Heritage Property Act*) (Government of Saskatchewan 1980). An area is considered heritage sensitive based on the presence of known Heritage Resources and the potential for new Heritage Resources to be discovered. The extent of previous land disturbance and nature and scope of the project are also taken into consideration. Additional screening criteria for northern Saskatchewan (northern parklands and boreal forest) to determine heritage potential, include (GS 2008):

- within 500 m of a Site of a Special Nature (SSN) (per. S. 64 of *The Heritage Property Act*), or other previously recorded site(s), unless the site has been determined to have low interpretive value;
- along dry, upland margins of a major bog or fen;
- within 250 m of watercourses or lakes;
- within 50 m of historic trails;
- within 250 m of strandlines; and
- on escarpments (defined by two or more contour intervals within 200 m), prominent uplands, and hills/ridges (including eskers) within 500 m of a water source.

Developments affecting areas of moderate to high potential will likely require the completion of an HRIA prior to construction. Eskers are especially important in Northern Saskatchewan as they have been interpreted by the HCB as being important travel routes for Precontact period people across a challenging landscape. An esker is defined as long ridge of gravel and other material deposited by a meltwater channel during glaciation (GS 2017). Several prominent eskers are located in the vicinity of the Project.

Additionally, the HCB has developed guidelines around exploration in northern Saskatchewan to help determine if a project requires an HRR (GS 2017). Exploration activities located within 100 m of a waterbody or watercourse, a known heritage site, or on

an esker require an HRR if they will disturb the mineral soils (i.e., soil below the leaf cover/organic duff). Activities that will cause disturbances to the mineral soil include:

- surface blading;
- stump removal; and
- grading.

Developments including permanent and temporary roads, new work camps, staging areas, and drill pads are likely to affect the mineral soil and would require an HRR. Activities that do not affect the mineral soil are unlikely to negatively affect heritage sites. These activities will not normally require an HRR and include:

- line cutting;
- mulching vegetation;
- geophysical survey;
- new work camps, roads, staging areas, drill pads, etc. constructed in areas that have been previously disturbed by development;
- new work camps, roads, staging areas, drill pads etc. constructed in areas that are more than 100 m from a watercourse or waterbody (except if located on an esker);
- drilling during frozen ground conditions or from drill pads located on a frozen lake; and
- any activity that will disturb less than 26 m^2 of mineral soil.

Denison followed all regulatory procedures as outlined above and submitted the Project to the HCB for review in 2017 and 2019. The results of the HRRs and the subsequent HRIAs are detailed in section 4.2.2.

3.0 PROJECT BACKGROUND

The Project is a proposed uranium mine and processing plant located in northern Saskatchewan, approximately 35 km north-northeast of Cameco Corporation's Key Lake Operation (Figure 1 and Figure 2). For the development of the Phoenix uranium deposit, Denison is planning on using ISR mining with on-site processing. Supporting components for the Project include the construction, operation, and decommissioning of a 7-km access road from Highway 914, an accommodation complex, operations centre, airstrip, a 5-km long road from site to the airstrip, site access roads, lined pads for storage of impurities from the processing plant and mineralized drill cuttings from the wellfield development, water treatment ponds, and potable, sewage, and wastewater treatment plants.

Any activity that affects the ground surface may negatively affect Heritage Resources. As such, all ground disturbance activities associated with the construction and operation of the Project should be considered potentially harmful to Heritage Resources and the HRMP will be consulted.

3.1 Environment

The Project is located in the Athabasca Basin of northern Saskatchewan. The Athabasca Basin is the world's leading source of high-grade uranium. The Athabasca Basin covers approximately 100,000 km^2 extending from just south of Lake Athabasca in the west to just east of Wollaston Lake.

The Project is located in the Wheeler Upland Landscaper Area of the Athabasca Plain Ecoregion (Acton et al. 1998). The most important factor in creating this physical landscape area is glaciation. This region is characterized by drumlinoid moraine that is largely covered by hummocky glaciofluvial outwash. The hummocky terrain creates well drained uplands and areas of small, poorly drained swales and flats. Eskers cross the region from northeast to southwest. Some of these eskers are more than 100 km long. These eskers would have provided Precontact period groups with effective travel routes through a rough and challenging landscape. Drainage in this region is weakly developed and water flows from lake to lake through small creeks. This area would have been deglaciated approximately 8,500 years before present (B.P.), providing a baseline for the earliest human habitation of the area (Dyke 2004).

The area is prone to forest fires and most of the area is in some state of regeneration (Acton et al. 1998). The uplands are dominated by jack pine and black spruce with an understory of lichen, Canada blueberry, and green alder. Low lying areas are dominated by bogs that may have black spruce, white birch, and willow, depending on the stage of regeneration.

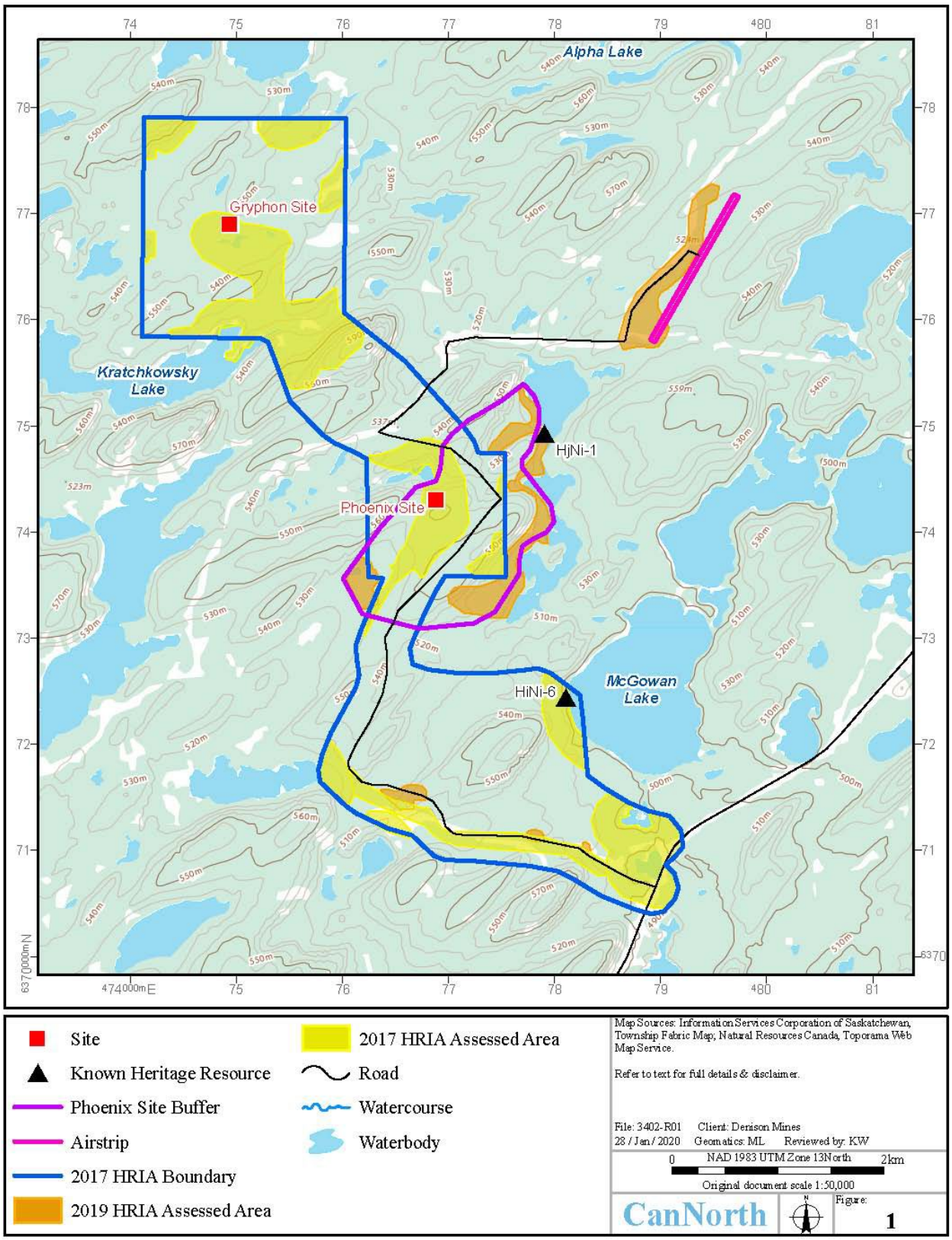


Figure 1. Heritage Resources near the Wheeler River Project

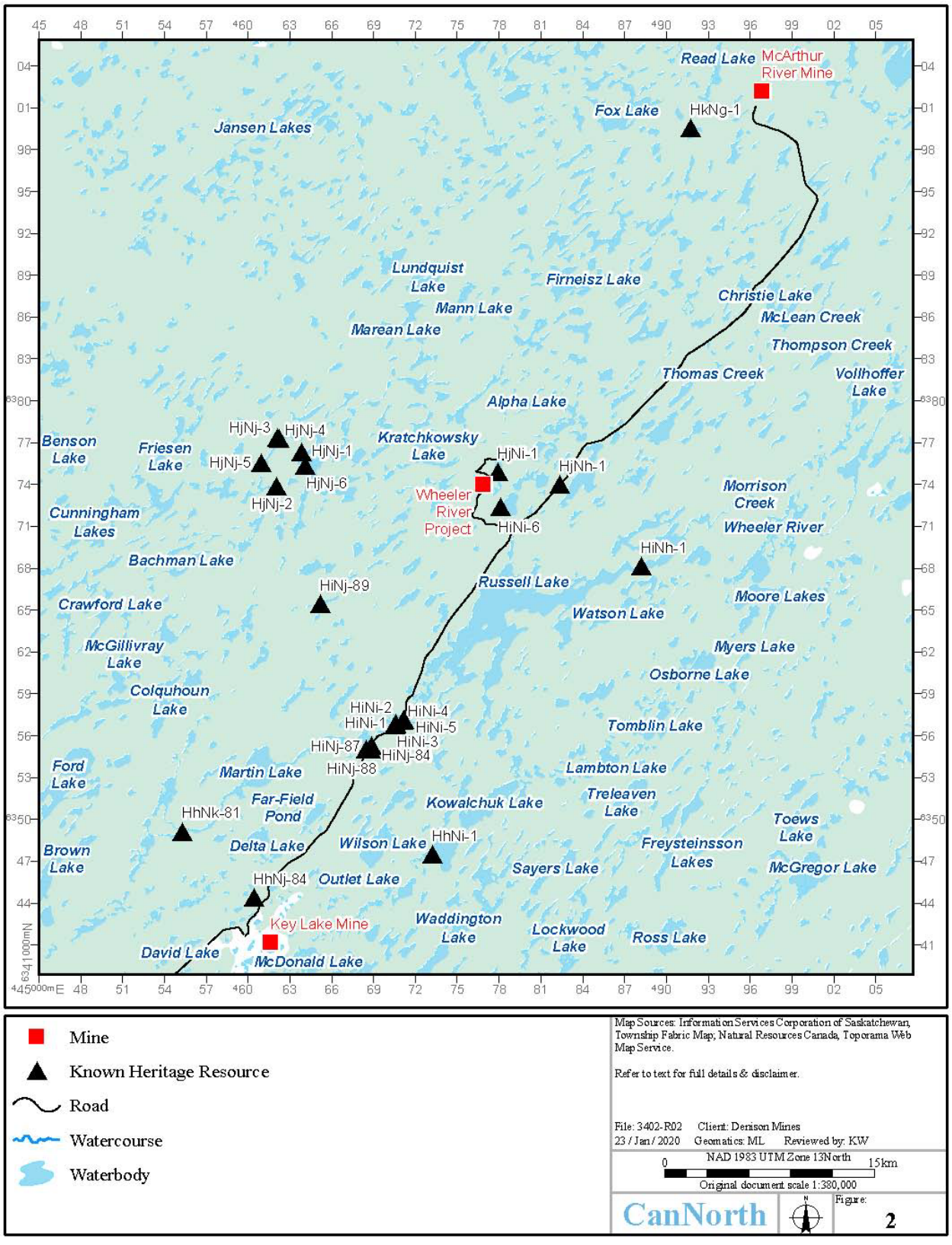


Figure 2. Heritage Resources associated with Mining Projects.

4.0 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 Culture History

In general, the culture histories, ancient land-use patterns, and ancient lifeways of northern Saskatchewan, including the Project area, are poorly understood because of the many problems associated with boreal forest archaeology. These problems include poor organic preservation, a lack of stratified sites and a paucity of archaeological work conducted in the north (Wright 1972; Hamilton 1988; Reid 1988; Ives 1993; Meyer 1995). Present knowledge of this area borrows heavily from archaeological research conducted in adjacent areas such as northeastern Alberta, Northwest Territories, Nunavut, northwestern Manitoba, and the more southern Northern Plains regions of the Prairie Provinces and northern United States. No culturally or temporally diagnostic archaeological materials have been discovered in the Project area, and the following discussion of the culture history, ancient land-use patterns, and lifeways of northern Saskatchewan should be seen as a temporary guide of current research until our knowledge base is broadened from future archaeological research in this region.

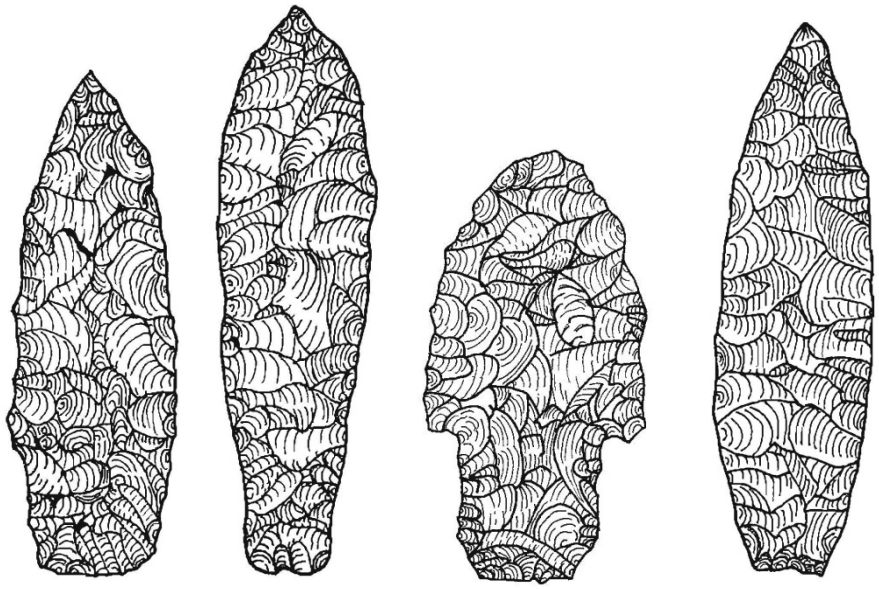
Deglaciation and draining of the associate proglacial lakes in the Project area would have been necessary in the Project area. The Project area would have been deglaciated approximately 8,500 years before present (B.P.), providing a baseline for the earliest human habitation of the area (Dyke 2004). In general, the culture history of northern Saskatchewan can be divided into four temporal periods (from earliest to latest): the Early Precontact period (9,500 to 7,500 B.P.); the Middle Precontact period (7,500 to 1,000 B.P.); the Woodland period (1,000 to 170 B.P.); and the Contact period, which commenced with arrival of early explorers and fur traders into the region approximately 170 years ago.

4.1.1 Early Precontact period (10,000 to 7,500 B.P.)

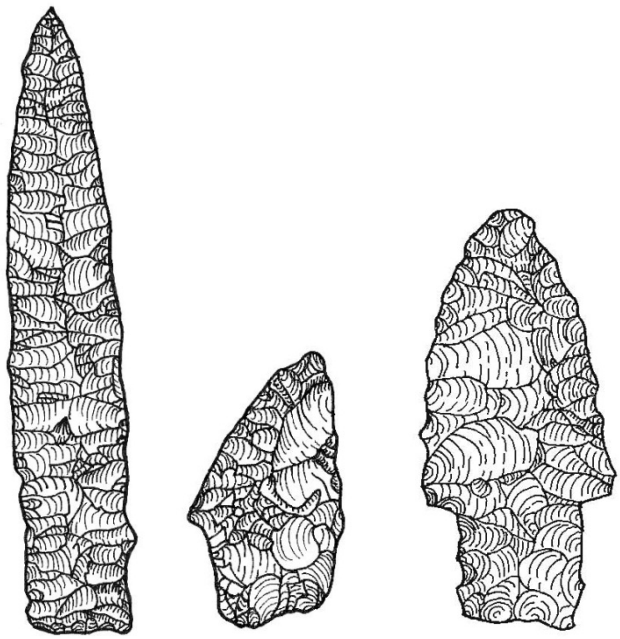
Environmental conditions at the beginning of this period would have been harsher than present conditions, supporting tundra-like vegetation and large fauna, including extinct species such as mammoth, horse, camel, elk, caribou, musk oxen, and early bison species (MacDonald and McLeod 1996; Meyer and Russell 2007). During this period, the Project area would likely have been occupied by small bands of mobile hunter gathers that would have depended on the available plant and faunal resources of the area shortly after deglaciation ~8,500 B.P.

Diagnostic artifacts of the Early Precontact period found in northern Saskatchewan include projectile points and tools from the Agate Basin complex (10,500 to 9500 B.P.), Goshen-Plainview complex (9,500 to 9,000 B.P.), Alberta complex (9,500 to 9,000 B.P.), Cody complex (8,800 to 8,400 B.P.), Hell Gap complex (10,000 to 9,500 B.P.), and Angostura complex (8,400 to 7,500) (Millar 1997; Meyer 1999; Amundson and Meyer 2003). The majority of these projectile points and tools have been discovered on the surface or have been excavated from an un-dateable context; however, an exception is a lanceolate point resembling the Angostura projectile point style excavated from the St. Louis site (FfNk-7), an archaeological site near the Town of St. Louis, Saskatchewan. Bone associated with this projectile point produced a date of 7,810 B.P. (Amundson and Meyer 2003).

Evidence of the Early Precontact period has not been found in the Project area or even nearby. Two Early period archaeological sites nearest to the Project area are GkNg-1, which is located along the Churchill River near Misinipe, Saskatchewan, and is represented by a projectile point resembling the Northern Plano / Angostura point style (~8,400 to 7,500 B.P), and the Old Beach site located near Buffalo Narrows, Saskatchewan, where a projectile point resembling the Alberta point style was discovered (9,500 to 9,000 B.P.).



Agate Basin, Hell Gap, Alberta, and Angostura projectile points.



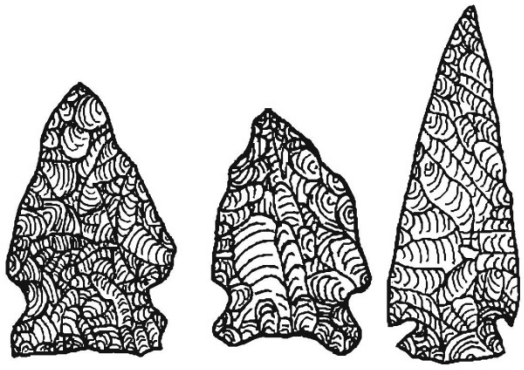
Cody complex: Eden projectile point, Cody knife, and Scottsbluff projectile point.

4.1.2 Middle Precontact period (7,500 to 1,000 B.P.)

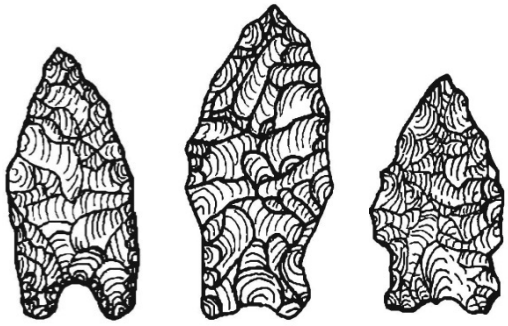
At approximately 7,500 B.P., a relatively hot and dry period known as the Hypsithermal caused a northern expansion of the Aspen Parklands, plains grasslands, plains bison, and subsequent plains/bison adapted people into portions of the southern zone of northern Saskatchewan (Johnson 1989; Ritchie 1989; Meyer 1999). Projectile points found in northern Saskatchewan from this period are indistinguishable from ones found in southern Saskatchewan; however, unlike the specialized bison hunting strategies used in southern Saskatchewan, people in the southern zone of northern Saskatchewan developed their own unique, more generalized, hunter-gatherer strategies (FMA 1992).

The Mummy Cave/Early Side-notched culture (7,500 to 5,000 B.P.) represents the earliest Middle Precontact period archaeological group to occupy this region (Meyer 1999). Projectile points of this style have been found at Lac La Loche (Steer 1977; Meyer 1995), the Near Norbert archaeological site (GlNp-1), located at the confluence of the Norbert and Haultain rivers (Meyer 1999) and at Brabant Lake (Pentney 2002). Archaeological groups that followed the Mummy Cave/Early Side-notched culture include the Oxbow culture (4,700 to 3,800 B.P.), the McKean culture (4,100 to 3,100 B.P.), and the Pelican Lake culture (3,300 to 2,000 B.P.). Projectile points affiliated with these archaeological cultures

have been found throughout the southern zone of northern Saskatchewan (Gryba 1974; Steer 1977; Hanna 1982; Meyer 1995; Millar 1997; Markowski and Wolfe 2013).



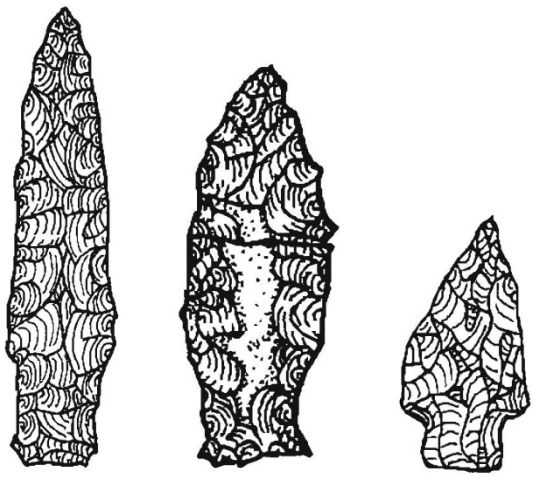
Mummy Cave, Oxbow, and Pelican Lake projectile points.



McKean Complex: McKean, Duncan, and Hanna projectile points.

In addition to the influence of plains-adapted archaeological cultures from the south, the southern zone of northern Saskatchewan was also influenced by barrenland adapted cultures from the north. The Taltheilei culture is typically divided into the Early period (2,600 to 2,100 B.P), Middle period (2,100 to 1,500 B.P.), and Late period (1,200 to Historic Period) (Gordon 1996; Meyer 1999) (Appendix C). It is believed that the Taltheilei archaeological culture represents ancestral Dené who continue to live and hunt in northern Saskatchewan (Noble 1971; Meyer 1999). Taltheilei projectile points have been discovered throughout the upper Churchill River basin and in Alberta, including the Primrose Weapons Range and the Cold Lake area (FMA 1992; Meyer 1995; Millar 1997). Taltheilei people used a strategy of following migratory barrenground caribou from their winter range north of the Thelon River and Beverly Lake in Nunavut to their summer range in northern Saskatchewan (Gordon 1996; Meyer 1999). The presence of Taltheilei archaeological sites as well as oral histories from the southern zone suggests that the southernmost range of

barrenland caribou during this time was much further south than it is at present (Holland and Kkailther 2003; Millar 2009; Korejbo 2011).

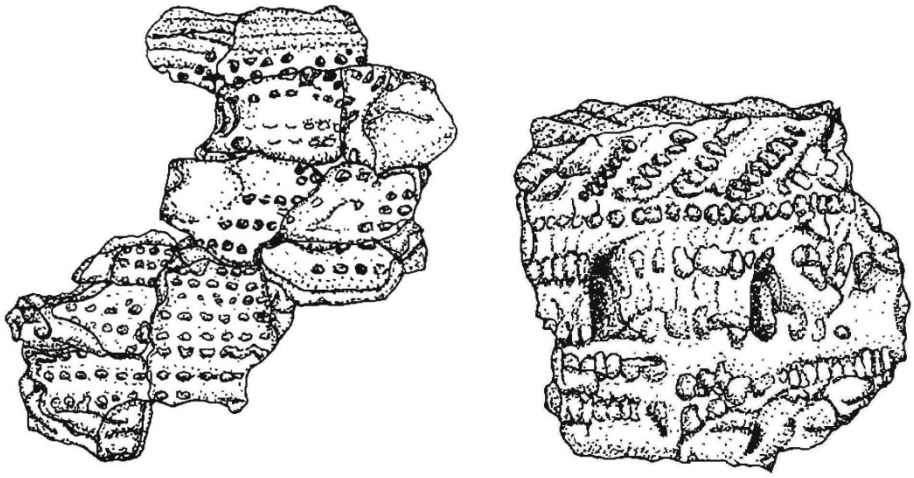


Early, Middle, and Late Taltheilei projectile points.

4.1.3 The Woodland period (1,000 to 170 B.P.)

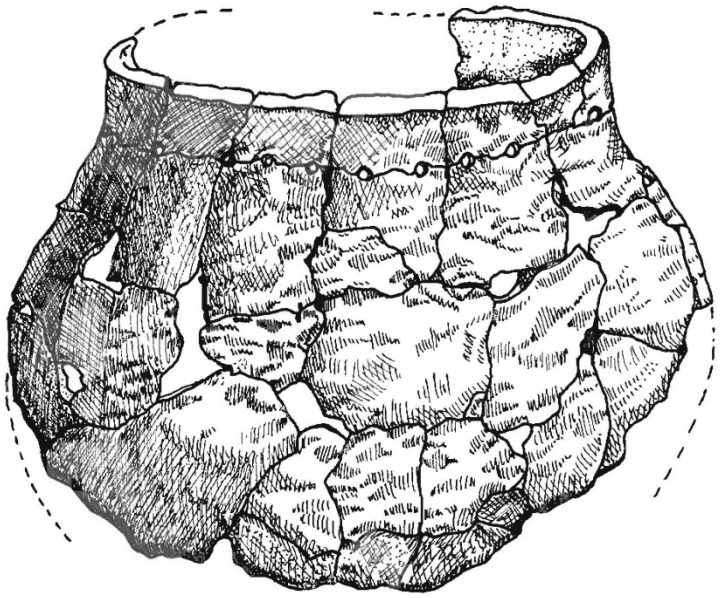
The Woodland period is generally divided into Early, Middle, and Late periods. Previous archaeological cultures throughout the Early Precontact period and Middle Precontact period are defined by diagnostic projectile points, whereas Woodland period groups are defined by pottery styles. Early Woodland period groups first appear approximately 2,500 years B.P. in the eastern United States, but do not appear to be present in Saskatchewan (Meyer 1999).

The earliest Woodland period group in northern Saskatchewan is defined by a Middle Woodland period group known as Laurel. In Saskatchewan, Laurel sites have been recorded along the Sturgeon Weir, Churchill, and Reindeer rivers (Meyer 1999). Although a precise time period of occupation remains unknown, a Laurel pottery sherd from the Spruce Rapids site on Amisk Lake has been dated to approximately 1,000 years B.P. The River House complex (1,220 to 850 B.P.), contemporaneous with later expressions of Laurel, was an archaeological culture that was present along the lower North Saskatchewan River valley and east and southeast into west-central Manitoba (Meyer 1999; Meyer et al. 2008). A third archaeological group known as the Blackduck culture (1,000 to 650 B.P.) was also present in northern Saskatchewan during the Laurel and River House occupations (Meyer 1999).



Laurel and Blackduck pottery sherds.

The Selkirk culture (700 to 300 B.P.) is considered a Late Woodland period group (Young 2006). Selkirk pottery styles recovered from the southern edge of the boreal forest and in the Buffalo Narrows region provide evidence for interactions and influences from plains groups in southern Saskatchewan (Meyer 1999). Selkirk likely signals the introduction of a distinct group of people from the eastern woodlands (Young 2006). A Selkirk composite pottery sherd recovered from the northern extent of Lac La Loche indicates a possible ethnic boundary between the Athabasca River drainage and the Churchill River drainage during the Late Woodland period (Korejbo 2011). In addition, rock paintings in northern Saskatchewan are also believed to have been made by the Algonquian speaking Selkirk culture throughout the Woodland Period (Meyer 1999; Jones 2006). It is believed that the Selkirk archaeological culture represents Algonquian-speaking people, who are ancestral to the Cree (Meyer and Russell 1987).



Selkirk pottery.

4.1.4 The Contact period: The Fur Trade

The Contact period in western Canada began with the arrival of early explorers and fur traders from the coasts of Hudson Bay. The first permanent inland trading post was established at Churchill, Manitoba, in 1717, nearly 100 years following the arrival of European goods, by William Steward of the Hudson's Bay Company (HBC) (SRC 1983). The Historic period in the southern zone begins as early as the earliest reconnaissance exploration into what is now eastern Saskatchewan by Henry Kelsey via the Red Deer River in 1691 (Russell 1999a). The Dené of northern Saskatchewan were perhaps the earliest group in Saskatchewan to be affected by the fur trade. David Meyer (SRC 1983a) suggests that the Dené likely obtained European goods as early as the 1620s. Although no inland trading posts had been established at this time, European goods made their way inland as a result of fur traders wintering and trading along Hudson Bay.

Trading posts were established in the southern zone of northern Saskatchewan following the establishment of trading posts along the Saskatchewan River during a period of intense competition among fur trade companies. Among the first trading posts in the southern zone of northern Saskatchewan was Fort St. Louis I established by French traders (1753-1757) near the present day James Smith Reserve (Russell and Meyer 1999). The establishment of

Cumberland House by the Hudson's Bay Company (HBC) in 1774 opened up trading activities in the southern zone of northern Saskatchewan. The Sturgeon Weir River and the Churchill River became crucial travel routes to access trading posts established in the Athabasca region (Russell and Meyer 1999). Fur trade explorers, including Peter Pond in 1778-1779, David Thompson in 1798-1799, and Peter Fidler in 1790-1792 travelled along the Sturgeon Weir River (Russell and Meyer 1999). Later expeditions that travelled along the Sturgeon Weir River include John Franklin in 1819-1822, J.B. Tyrell in 1894, and William McInnes in 1910 (Russell 1999b; Russell 2006).

4.2 Archaeological Background

The HCB's archaeological site database was consulted to determine the type and number of known sites recorded near the Project. In addition, the extent of previous archaeological work in the area was reviewed (Figure 2). Given the remote location of the Project, the record of archaeological sites is quite slim. This paucity of archaeological sites does not mean that there are not archaeological sites in the region but rather reflects the lack of archaeological research. The majority of the archaeological sites found in the region were identified in relation to resource development. In general, known archaeological sites in the north are clustered around mines or along roadways, reflecting the development pattern in the area and not the settlement patterns of past peoples.

In addition to the remote nature of the area, archaeological research is hampered by additional factors: a lack of stratified sites and a lack of organic materials. There has been little to no soil deposition in the project area since the advent of human occupation, and therefore, sites in the region do not exhibit distinct occupation layers (Meyer 1979). Stratification allows archaeologists to examine chronological changes at a site and to examine large-scale archaeological patterns in a regional and chronological context. Archaeologists also rely on carbon dating to date sites. However, the acidic soil in the region hampers preservation of organic materials in an archaeological site and organics (i.e., bones) are rarely found in the boreal forest. Therefore, the only way to reliably date sites in the region is through the use of diagnostic artifacts (Meyer 1979).

4.2.1 Previous Archaeological Research

Archaeological research in the Project area did not begin until the 1960s when archaeologists from the Saskatchewan Museum of Natural History (now the Royal

Saskatchewan Museum [RSM]) briefly visited Cree Lake in 1964 (approximately 40 km east of the Project). The first, large-scale archaeological research project in the area was conducted in 1978 by Dr. David Meyer in the Key Lake-Zimmer Lake region as part of the Environmental Impact Statement (EIS) for the proposed Key Lake Project (now the Key Lake Mine). The Key Lake Mine is located approximately 35 km south of the Project. During the multi-year project, Meyer identified and recorded 76 sites and 9 find areas (Meyer 1979). This project formed the baseline for all archeological research in the area and is still considered the single most important archaeological survey in the area to date.

4.2.2 Denison Baseline Heritage Resource Impact Assessment

Two HRIAs have been completed for the Project in 2017 and 2019 (Figure 1). The Project was submitted to the Heritage Conservation Branch (HCB) in 2017 and 2019 and HRRs were completed. The HRRs determined that portions of the project were located on heritage sensitive terrain and HRIAs were required.

A baseline HRIA was completed in 2017 under Archaeological Investigation Permit No. 17-091 (Golder 2017). A preliminary project footprint was initially reviewed by the HCB, and it was determined that portions of the project were located in heritage sensitive terrain (i.e., previously undisturbed, hilly terrain with prominent uplands in close proximity to permanent water sources) and an HRIA was required (HCB File No. 16-2102). A baseline HRIA was completed during the summer of 2017 under Archaeological Investigation Permit No. 17-091. The goal of baseline field assessments is to help to determine the nature of archaeological sites, the types of landforms in which sites are located, and the characteristics of artifacts that may be found within the baseline study area. This survey investigated several proposed access roads for the Project and approximately 393 ha were surveyed by archaeologists and a local assistant from the English River First Nation. The survey utilized pedestrian survey (walking and looking for visible evidence of past human behavior), the inspection of areas where soil and sediment were exposed (i.e., natural and mechanical disturbances to the soil), and the excavation of 258 shovel probes (approximately 40 cm by 40 cm, 40 cm deep holes dug by hand and sorted through by hand), and 5 shovel tests (approximately 50 cm by 50 cm, 40 cm deep holes dug by hand and sorted through a ¼” mesh screen).

A single site, HiNi-6, was identified after one flake (fragment of stone produced as a result of stone tool manufacture) was found in a shovel test on a terrace overlooking McGowan

Lake (Figure 1). The site is located near, but not in conflict with, the proposed access road for the Phoenix Site. The artifact was identified approximately 15 cm below the surface (dbs). Further shovel tests were excavated in order to assess the size, nature, and significance of the site, however, no further artifacts or Heritage Resources were discovered during the assessment. HiNi-6 is summarized below in section 3.2.2.1. Based on the results of the HRIA, the HCB determined that HiNi-6 was of limited interpretive value, and there were no concerns with the development proceeding as planned within the surveyed areas (HCB File No. 16-2102, December 14th, 2017). Regulatory approval as per section 63 of *The Heritage Property Act* (Government of Saskatchewan 1980) was granted for the Project (HCB File No. 16-2102, December 14, 2017). Furthermore, Denison will not be developing the proposed access road adjacent to HiNi-6 and the site will not be affected.

The project footprint was refined in 2019 and was resubmitted to the HCB for their review. The majority of the refined footprint overlapped with the footprint that was reviewed in 2017; however, the HCB determined that several areas of the refined footprint would have the potential to affect heritage sensitive terrain that had not been previously surveyed during the 2017 fieldwork and an HRIA was required. Approximately 284 ha were surveyed in the Phoenix Project buffer area, as well as additional areas along the previously assessed access roads, and near the air strip (Permit No. 19-065; Golder 2020).

The survey was completed by archaeologists and a local assistant from the English River First Nation utilizing pedestrian survey, the inspection of areas where soil and sediment were exposed, and the excavation of 212 shovel probes and 5 shovel tests. A single archaeological site, HjNi-1, was identified just outside the Phoenix buffer area after a single flake single flake was identified on the surface of an existing road that overlooks the confluence of a lake and a creek (Figure 1). To assess the site, the road was further examined for additional artifacts and additional shovel tests were excavated near the road, however, no additional artifacts or Heritage Resources were identified during the assessment. HjNi-1 is summarized below in section 3.2.2.2. Based on the results of the HRIA, the HCB determined that HjNi-1 was of limited interpretive value, and there were no concerns with the development proceeding as planned within the surveyed areas. Regulatory approval as per section 63 of *The Heritage Property Act* (Government of Saskatchewan 1980) was granted for the Project (HCB File No. 19-933 February 12th, 2020).

4.2.3 Known Heritage

In total, 16 archaeological sites have been identified with a 20-km radius around the project area (the Regional Study Area). Of the 16 sites, 15 were identified during heritage and environmental surveys for mining industry projects. The remaining site was identified by a local informant. The sites consist of artifact finds (n=10), artifact scatters (n=4), an artifact/feature combination (n=1), and a multiple feature site (n=1). Six of the sites could not be assigned a cultural or temporal affiliation. Nine of the sites are Precontact period sites and the last site is a Historic First Nation Site. Diagnostic artifacts were not identified at the sites to allow for a more specific cultural affiliation.

Table 1. Known archaeological sites within a **20-**kilometre radius of the project area.

Borden No.	Site Type	Cultural Affiliation	Permit No.
HiNh-1	Artifact/Feature Combination	Unknown	03-000
HiNi-1	Artifact Find	Unknown Precontact	78-000
HiNi-2	Artifact Find	Unknown Precontact	78-000
HiNi-3	Multiple Features	Historic First Nation	78-000
HiNi-4	Artifact Scatter	Unknown Precontact	90-037
HiNi-5	Artifact Find	Unknown Precontact	99-072
HiNi-6	Artifact Find	Unknown Precontact	17-091
HiNj-89	Artifact Find	Unknown Precontact	11-000
HjNh-1	Artifact Find	Unknown	93-058
HjNi-1	Artifact Find	Unknown Precontact	19-065
HjNj-1	Artifact Find	Unknown	07-183
HjNj-2	Artifact Scatter	Unknown Precontact	07-183
HjNj-3	Artifact Scatter	Unknown	07-183
HjNj-4	Artifact Find	Unknown	07-183
HjNj-5	Artifact Find	Unknown	07-183
HjNj-6	Artifact Scatter	Unknown Precontact	10-187

Two sites, HiNi-6 and HjNi-1 were identified during HRIAs conducted for the Project and are discussed below.

4.2.3.1 HiNi-6

HiNi-6 was identified during a baseline HRIA for Denison under Archaeological Resource Investigation Permit No. 17-091 (Golder 2017). The site is a Precontact period artifact find located on a terrace edge that overlooks a lake to the east. The terrace is flat, with

undulating terrain and a small drainage to the west, and a steep slope down to a sandy beach along the lake to the east.

A single large, grey secondary flake was identified in a shovel test. The flake exhibited retouching along the concave edge. Four additional shovel tests were excavated adjacent to the positive shovel test. No additional artifacts were identified. Given the low density of artifacts, it was determined that the site had limited interpretive value, and no further work was required at the site.

4.2.3.2 HjNi-1

HhiNi-1 was identified during a HRIA of the Phoenix buffer area under Archaeological Resource Investigation Permit No. 19-065 (Golder 2020). The site is a Precontact period artifact find identified on the surface of an access road. Terrain in the area consists of flat forested uplands with a rock escarpment to the east. The confluence of a creek and a lake is located just north of the site.

A single quarzitic sandstone flake was identified. Subsurface exposures along the access road were examined and five shovel tests were excavated along the boundaries of the area disturbed by the access road. No additional artifacts or paleosols were identified in the shovel tests. Given the low density of artifacts, it was determined that the site had limited interpretive value, and no further work was required at the site.

5.0 HERITAGE RESOURCES MANAGEMENT POLICY

The following section outlines the HRMP developed for the Project. The legislation outlined above, the HCB's guidelines for mining and forestry work, the results of past HRIAs completed for the Project, previous archaeologic research, and the heritage potential of the area have been taken into consideration when developing this policy. The HRMP consists of a chance find procedure and then outlines the management of Heritage Resources should they be identified during the life of the project. The HRMP also identifies activities which may require submission to the HCB for further review.

This HRMP will be considered a living document and will be updated as needed. These updates may include concerns and suggestions from Indigenous Communities, updated heritage requirements from the HCB, changes to methodology, and the recording of additional archaeological sites within the Project area.

5.1 Chance Finds Procedure

The following steps and procedures should be followed in the case of any incidental or chance find, including archaeological or palaeontological sites, or human remains. For the purpose of this proposed procedure, a "Designated Person" is someone involved in the Project (e.g., Denison supervisor) and assigned responsibility for the protection of the find and the steps going forward, and an "Indigenous Community" is any Indigenous Community who Denison commits to engage in the event of a chance find.

1. If a chance find is suspected, all activity in the area of the discovery site is to stop immediately and the steps below are to be followed:

    a. All artifacts and features will be left in the same position in which they were discovered, and no objects will be removed from the location.
    b. A supervisor or the Designated Person must be informed immediately.
    c. Denison will isolate and protect the area by establishing a temporary buffer of 30 m around the discovery (i.e., staking, flagging, snow fencing, etc.) to prevent further disturbances in the area.
    d. The Designated Person will provide the following information to the HCB or a qualified archaeologist for evaluation: the GPS location of the discovery and photographs of the site location, identified artifacts, objects, or soil discolourations.

e. The Designated Person will inform the Indigenous Communities of the find, and provide updates of any relevant changes, decisions, or new information.
f. The professional archaeologist will work with Denison and the Designated Person to assess the significance of the discovery through surface inspection and ensure adequate protection measures are in place for the discovery. These protection measures will be communicated by the Designated Person to the Indigenous Communities.
g. If the archaeologist, in consultation with the Designated Person, determines that the object is archaeological in nature, the Designated Person will inform the Indigenous Communities and the steps outlined below will be followed.
h. If the object or feature is not archaeological in nature, then the work may proceed as planned.

2. Should a staff member encounter a suspected archaeological find during their leisure time (e.g., walking along a path or a beach) they will inform Denison who will commence the chance finds procedure outlined above.

3. If the object has been determined to be human remains, or if they are suspected to be human remains, the RCMP, the coroner, and the HCB must be contacted immediately, as per the Archaeological Burial Management Policy (2010) and under the authority of *The Heritage Property Act* (Government of Saskatchewan 1980).
   a. The Designated Person will promptly communicate with the Indigenous Communities, and shall provide updates of any relevant changes, decisions, or new information.
   b. If the remains are modern, requirements from the RCMP must be followed.
   c. If the remains are determined to be archaeological, then the HCB and Indigenous Communities will be consulted to determine how to proceed.

4. If the object is archaeological in nature, but not human remains, the archaeologist will contact the HCB and will obtain an Archaeological Resources Investigation Permit if necessary.
   a. The professional archaeologist, in consultation with the HCB, will conduct a HRIA in accordance with all site health and safety protocols and the regulatory requirements of *The Heritage Property Act* (Government of Saskatchewan 1980).

5. The results of the HRIA will be discussed with Denison, the HCB, the Designated Person, and the Indigenous Communities.
    a. Recommendations for protecting the archaeological site, the archaeological object, and mitigation measures will be determined in consultation with these above communities.

6. The archaeologist will work with Denison and the Designated Person to prepare written instructions for recommencement of work in the area, which will become part of the clearance recommendations in the HRIA permit report.
7. The archaeologist will prepare a draft of a HRIA permit report and a Saskatchewan Archaeological Resource Record (SARR) form to obtain regulatory approval for the Project for submission to Denison, the Designated Person, Indigenous Communities, and the HCB.
    a. Following approval of the HRIA permit draft report, final submission to the HCB, and regulatory approval, final copies will be provided to Denison, the Designated Person, and the Indigenous Communities.

8. Preservation of archaeological objects will follow requirements as outlined by the HCB, the RSM, and the Indigenous Communities, including the agreed upon cultural protocols.

5.1.1 Staff Education

All staff working at the Project should be informed of the possibility that they could encounter archaeological resources during their work/leisure time and the proper procedure to follow in the case of a chance find. This could be facilitated by a short archaeological education section in the employee orientation, outlining the types of sites and artifacts that could be encountered in the area, as well as what to do when a potential artifact or site is found.

5.2 Heritage Resources Impact Assessment

As explained above, if the chance find is deemed to be an archaeological site, then a HRIA is required, and a qualified archaeologist must complete the assessment. The archaeologist will apply for an Archaeological Resource Investigation Permit (Permit) from the HCB. It takes a minimum of two business days to receive a Permit; however, the amount of time

required to receive a Permit from the HCB is dependent on their current workload and may take up to one week or longer. The HRIA fieldwork will be completed following the requirements outlined in the Heritage Resource Review (HRR) as well as any additional requirements from the HCB (if any) following the receipt of the Permit. The HCB may also add additional requirements during this stage of the process if they deem necessary. A SARR form is completed and submitted to the HCB to register the find as an archaeological site if a new site is identified, or if a known site is investigated further. A report outlining the results of the HRIA fieldwork will be completed and will include archaeological resource management recommendations to the HCB. Recommendations can include full heritage clearance, or conditional heritage clearance based on avoidance of the archaeological resource(s) (preferred), or that further archaeological investigations are completed to mitigate the affects of the project to archaeological resources. These recommendations will be discussed in management options. The HCB will issue a formal clearance letter granting either full heritage clearance for the Project to proceed, or conditional heritage clearance following the review and receipt of the final report.

5.3 Management of Heritage Resources

Heritage Resources can be managed in several ways including avoidance (preferred), mitigation, post-impact assessments, and altered work practices. In many cases a combination of management practices is utilized. SSN are offered additional protection and avoidance may be considered the only option. Each Heritage Resource should be considered unique as should the specific management of each resource. Management options will be discussed by the archaeologist and the HCB, in consultation with Denison. Management options will also be presented to the applicable Indigenous Communities for feedback and discussion regarding management of the resource and to ensure that the proper cultural protocols are being followed. Additionally, the management of Heritage Resources will include consultation with Indigenous communities and the submission of any new development to the HCB for review. Management options are discussed below.

5.3.1 Consultation with Indigenous Communities

The appropriate Indigenous Communities should be consulted prior to archaeological fieldwork regarding Heritage Resources and to determine what the proper cultural protocol would be if Heritage Resources are discovered. Protocols should be discussed regarding the initial discovery of the heritage resource, potential mitigation of the heritage resource,

and the curation of the resource. Indigenous Communities may have preferences regarding how the HRIA is conducted, for example, they may ask that tobacco be placed in shovel tests where artifacts are identified, for an elder to bless artifacts, or they may request that artifacts are stored in a specific manner (e.g., with sage or tobacco). These protocols should be followed if possible; however, it should be noted that some protocols may affect future curation of Heritage Resources, and that it may be necessary to discuss these protocols with the HCB, RSM, or the Canadian Conservation Institute (CCI).

It is understood that many Indigenous Communities have an interest in repatriating artifacts to their traditional territories. The RSM does have a repatriation and shared stewardship policy and can be contacted by interested Indigenous Communities to discuss the long-term storage and repatriation of artifacts (RSM 2020). These discussions may include storage requirements from the RSM to ensure the stability of the artifacts and legal procedures that will need to be followed to allow for the permanent storage of artifacts outside of RSM properties.

5.3.2 Avoidance

Avoidance or partial avoidance of Heritage Resources through route or project location alterations are often the preferred method of management as other management methods (e.g., mitigative excavations) result in the destruction of the heritage resource. Avoidance may entail moving portions of the project (e.g., altering road alignments) to avoid Heritage Resources or changing construction processes to minimize ground disturbance (e.g., completing vegetation clearing in frozen conditions, boring pipelines/culverts). Avoidance buffers around sites can range from as small as 5 m to as large as 250 m (e.g., for SSN), but are more commonly approximately 25 m. Buffers around heritage sites will be established in consultation with the HCB. If construction plans are altered and the site can no longer be avoided, the HCB must be informed, and other management strategies will need to be employed. In the case of SSN, avoidance is recommended unless there is no other option.

5.3.3 Mitigation

Mitigation may be a viable option if Heritage Resources cannot be avoided. Two common forms of mitigation include intensive and detailed systematic shovel testing and

archaeological excavation. These mitigative options generally follow a progression of archaeological investigations and will be discussed further in the paragraphs below.

The mitigation of a heritage resource can also occur through simple assessment during a HRIA. During these assessments, it may be determined that further archaeological investigations would be unlikely to result in the recovery of significant interpretive/scientific data, and no further work would be recommended. If the results of simple assessment suggest that the site is more significant and that further archaeological investigations would likely result in the recovery of significant interpretive data, then a higher level of assessment may be recommended.

A further level of assessment would involve a more detailed systematic and intensive shovel testing assessment program to further determine the extent, nature, and significance of the Heritage Resources at the site. This level of assessment may be determined and conducted during the initial HRIA assessment, or it may be determined later on by the HCB. If sufficient testing is required at a site, and the results suggest that further investigations are unlikely to result in the recovery of significant interpretive/scientific data, it might be recommended that further work is not needed at the site. However, the results of the testing, as well as any recommendations, will need to be presented to, and approved by the HCB. The HCB may require a further stage of work based on the results. If the results of the detailed systematic and intensive shovel testing program identifies that the site is significant, or if any artifact concentrations or features are present that might contain important interpretive data, a further level of archaeological investigations (usually mitigative excavations) will likely be recommended.

Although the excavation of an archaeological site is inherently destructive, when done in a controlled manner, meaningful data can be gathered to contribute to the overall knowledge of past peoples in the Project area. Mitigative excavations require a mitigation permit from the HCB and the methodology for the excavation should be discussed with the HCB prior to conducting the fieldwork. Excavations often go through several stages with additional excavations required based on results (i.e., if the known significance/extent of the site is increased during excavations, more excavations/investigations may be required). The site and any finds are recorded in detail throughout the excavation process. Any artifacts/ecofacts discovered will be taken to a lab to be analysed and recorded in detail, and may be submitted for further analysis (e.g., radiocarbon dating, blood residue analysis, thermoluminescence dating, etc.). Any additional requirements for analysis should be

discussed with the HCB. The results of the excavations are summarized in a report that is submitted to the HCB for approval. Final approval of the mitigations will be made by the HCB. Any formal heritage clearances will be issued by the HCB following their approval and receipt of the final report.

Finally, at any point in the assessment process, the HCB may recommend construction monitoring. Construction monitoring involves a qualified archaeologist observing construction and continually inspecting disturbances created during construction. The archaeologist may stop construction at any point to examine potential artifacts. If an artifact is identified, the archaeologist will assess and record the artifact so that construction can continue. Construction monitoring can occur in both frozen and unfrozen conditions. The results of the construction monitoring are summarized in a report that is submitted to the HCB for approval. Final approval of the construction monitoring will be made by the HCB. Any formal heritage clearances will be issued by the HCB following their approval and receipt of the final report.

5.3.4 Altered Work Practices

Potential effects to sites can often be mitigated by adjusting the timing and approach to construction. This may include scheduling vegetation clearing during frozen conditions to reduce effects to the soil or using rig matting to avoid rutting up areas with sites, etc.

5.3.5 Additional Heritage Resource Reviews

Any new developments during the operational life of the mine that might affect Heritage Resource should be submitted to the HCB for an HRR. Changes to the project may include the expansion of the Project footprint or the addition of new infrastructure (e.g., roads). If the proposed developments are within the areas addressed during the baseline HRIAs conducted in 2017 and 2019, additional work may not be required; however, submission is still recommended.

6.0 CLOSURE

If you have any questions or require additional information regarding this HRIA, please contact the undersigned.

Sincerely,

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Archaeologist

Canada North Environmental Services

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