

Appendix B.11

Stage 1 Archaeological Assessment



ORIGINAL REPORT

Stage 1 Archaeological Assessment

Crawford Nickel Project District of Cochrane, and City of Timmins, Ontario

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Submitted by:

WSP Canada Inc.

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Executive Summary

The Executive Summary summarizes only the key points of the report. For a complete account of the results and conclusions, as well as the limitations of this study, the reader should examine the report in full.

WSP E&I Canada Limited (WSP; formerly Wood Environment & Infrastructure Solutions Canada) was retained by Canada Nickel Company (CNC) to conduct a Stage 1 archaeological assessment as part of the proposed Crawford Nickel Project (the Project). The Project is located in parts of the Geographic Townships of Nesbitt, Beck, Mahaffy, Crawford, Lucas, Carnegie, and Prosser in the District of Cochrane, and partially within the City of Timmins (former Kidd and Wark Townships of District of Cochrane), Ontario (the Project Boundary) (Appendix A: Figure 1, Figure 2, and Figure 3). For the purposes of this study, the Archaeology Study Area (study area) includes the Project Boundary plus a 500-m buffer. In total, the study area covers approximately 16,843 hectares (ha) and is primarily private land.

CNC intends to develop, operate, and eventually reclaim a new open-pit nickel mine in the study area. The mine will be developed in a greenfield location within the study area with no previous history of mining activity. It will consist of an open pit mine and associated processing and stockpiling facilities, as well as rerouting Provincial Highway 655, which bisects the study area, around the project components. This archaeological assessment was undertaken to support a Federal Impact Statement under the Government of Canada *Impact Assessment Act* (S.C. 2019, c.28, s. 1). A preliminary development plan is provided as Appendix A: Figure 4.

The Stage 1 archaeological assessment was conducted according to the Ontario Ministry of Citizenship and Multiculturalism (MCM) 2011 *Standards and Guidelines for Consultant Archaeologists* (MCM 2011) under Project Information Form (PIF) number P327-0017-2021. An optional Stage 1 property inspection was not conducted as part of this assessment, but CNC provided permission to enter the study area for 16-17 May 2023 to conduct a helicopter flyover of areas identified to have archaeological potential. In keeping with CNC's commitment to Indigenous engagement for the Project, draft versions of the Stage 1 archaeological assessment were provided for review and comment to the Wabun Tribal Council (Flying Post, Matachewan, and Mattagami First Nations), Taykwa Tagamou Nation, and the Métis Nation of Ontario. The comments received were addressed in the final version of this report (Supplementary Documentation, Section 1).

The Stage 1 archaeological assessment indicated that approximately 416 ha (2.5%) of the study area has general archaeological potential (Appendix A: Figure 10) for the following reasons: 1) portions of the study area are within 50 m of primary water sources (Mattagami, North Driftwood, and West Buskegau rivers; Jocko Creek; and Martin, Gerry, Jack, Sutherland, Mel, Zed, Boundary, and Feldman lakes); 2) portions of the study area have an elevated topography associated with an esker; 3) a portion of the study area is associated with pockets of sandy soil; and 4) there are archaeologically significant natural resource areas in the study area (medicinal plants).

The Stage 1 archaeological assessment also determined that approximately 461 ha (2.7%) of the study area has no or low archaeological potential (Appendix A: Figure 10) due to recent extensive and deep land alterations during forestry and mining operations and road, transmission line, and generating station construction. Approximately 175 ha (1.0%) of the study area was previously investigated through Stage 1 and Stage 2 archaeological assessments and evaluated to have no or low archaeological potential. Additionally, approximately 11,671 ha (69.3%) of the study area is permanently wet with no or low archaeological potential, and approximately 4,117 ha (24.4%) of the study area is over 50 m from a modern water source and not associated with a historic water source such as a glacial shoreline.

Based on the findings of the Stage 1 archaeological assessment of the study area, the following recommendations are made, subject to the conditions outlined below and in Section 8.0:

- 1) Approximately 416 ha (2.5%) of the study area is identified to have archaeological potential but is a wooded environment where ploughing is not possible or viable (Appendix A: Figure 10). If the Project will impact any areas identified to have archaeological potential, Stage 2 archaeological assessment should include, in addition to standard visual inspection, examining the stream banks in the modelled areas from watercraft to refine the areas of archaeological potential that require Stage 2 test pit survey. The Stage 2 test pit survey should then be conducted through hand digging shovel test pits at distances between 0 m and 50 m from the modern primary water sources at 5-m grid intervals, or at 10-m intervals on the features of archaeological potential (i.e., the esker and sandy area), per Section 2.1.5 Standard 1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011). Per Section 2.1.2 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), the test pit survey must be conducted to within 1 m of built structures or until the test pits reveal evidence of recent ground disturbance, and all test pits must be a minimum of 30-centimetres (cm) diameter and dug to a minimum of 5 cm into subsoil. All excavated soil or sediments must be screened through 6-millimetre (mm) mesh screens to recover artifacts. The excavated test pits should be examined for stratigraphy, cultural features, or evidence of fill, then backfilled to level grade unless directed otherwise by the proponent. If archaeological resources are found, the test pit survey must continue on the established grid to determine if there are other archaeological resources in sufficient quantities to recommend Stage 3 archaeological assessment; if there are insufficient archaeological resources to recommend Stage 3 archaeological assessment, it is required that intensified test-pit survey and test-unit excavations be conducted at the initial find location following Option A or B under Standard 2, Section 2.1.3 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011).

However, per Section 2.1.9 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), test pit excavation may be difficult or impossible in undisturbed forest floors that exhibit shallow soil horizons. At the discretion of the licensed archaeologist, the undisturbed forest floor may be investigated through a combination of methods including surface inspection and test-pit survey, surface investigation as an alternative to test-pit survey, and/or using a soft-toothed leaf rake to clear vegetation over 2-m diameter areas spaced at not more than 5-m intervals between the centres of the cleared areas. In cases where the live vegetation is dense, the surface raking can be augmented with close (“hands and knees”) visual inspections. If archaeological resources are found during these methods, a 10-m-square area centred on the positive area should be cleared of vegetation; if the positive cleared area continues beyond a 10-m square area, vegetation clearing from 2 m diameter areas should continue at 5 m intervals.

If sufficient archaeological resources are found to warrant Stage 3 archaeological assessment, any subsequent Stage 3 archaeological assessment should employ field methods appropriate to First Nation and Métis archaeological sites in northern Ontario.

- 2) As part of any future Stage 2 archaeological assessment(s) for the Project, First Nation and Métis communities with an interest in the Project should be invited to participate in the fieldwork and review the draft Stage 2 report(s). First Nation and Métis communities with an interest in the Project should also be consulted on the field methods employed for the Stage 2 and any subsequent archaeological assessment(s).
- 3) The recommendation by Archaeological Services Inc. (2024) to conduct Stage 1 property inspection to confirm low archaeological potential is still in effect for approximately 4 ha (0.02%) of the study area (Appendix A: Figure 10).

- 4) Approximately 461 ha (2.7%) of the study area was subjected to recent extensive and deep land alterations during forestry and mining operations (Kidd Creek Mine) and road, transmission line, and generating station construction and requires no further archaeological assessment (Appendix A: Figure 10).
- 5) Approximately 175 ha (1.0%) of the study area was previously assessed through Stage 1 and Stage 2 archaeological assessment and requires no further archaeological assessment (Appendix A: Figure 10).
- 6) Approximately 11,671 ha (69.3%) of the study area is permanently low and wet and requires no further archaeological assessment (Appendix A: Figure 10).
- 7) Approximately 4,117 ha (24.4%) of the study area is over 50 m from a modern water source, and not associated with a historic water source such as a glacial shoreline. These areas of low archaeological potential, though not evaluated through Stage 1 property inspection, are in remote locations where there are practical obstacles to achieving access. These obstacles include a lack of available transportation infrastructure (i.e., roads, trails), thick forest, and poorly drained terrain that presents challenges even for tracked vehicles to traverse. Per Section 1.3.4 Standard 1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), these areas are exempt from Stage 2 archaeological survey (MCM 2011) (Appendix A: Figure 10).

The recommendations above are subject to review by the Ministry of Citizenship and Multiculturalism.

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1.0 PROJECT CONTEXT

1.1 Development Context

WSP E&I Canada Limited (WSP; formerly Wood Environment & Infrastructure Solutions Canada) was retained by Canada Nickel Company (CNC) to conduct a Stage 1 archaeological assessment as part of the proposed Crawford Nickel Project (the Project). The Project is located in parts of the Geographic Townships of Nesbitt, Beck, Mahaffy, Crawford, Lucas, Carnegie, and Prosser in the District of Cochrane, and partially within the City of Timmins (former Kidd and Wark Townships of District of Cochrane), Ontario (the Project Boundary) (Appendix A: Figure 1, Figure 2, and Figure 3). For the purposes of this study, the Archaeology Study Area (study area) includes the Project Boundary plus a 500-m buffer. In total, the study area covers approximately 23,985 hectares (ha) and is primarily private land.

CNC intends to develop, operate, and eventually reclaim a new open-pit nickel mine in the study area. The mine will be developed in a greenfield location within the study area with no previous history of mining activity. It will consist of an open pit mine and associated processing and stockpiling facilities, as well as rerouting Provincial Highway 655, which bisects the study area, around the project components. This archaeological assessment was undertaken to support a Federal Impact Statement under the Government of Canada *Impact Assessment Act* (S.C. 2019, c.28, s. 1). A preliminary development plan is provided as Appendix A: Figure 4.

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This report presents the results of the Stage 1 background study and helicopter flyover, analysis of archaeological potential in the study area, and recommendations for further assessment, where appropriate.

1.2 Scope of Work

A Stage 1 archaeological assessment is a qualitative study that systematically assesses the archaeological potential of a study area based on its land use and evidence of possible pre- and early post-contact archaeological resources. Following the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011:13), the objectives of a Stage 1 archaeological assessment are to: 1) provide information about the study area's geography, history, previous archaeological fieldwork and current land conditions; 2) evaluate in detail the study area's archaeological potential to support recommendations for Stage 2 archaeological assessment for all or parts of the study area, if required; and, 3) recommend appropriate strategies for Stage 2 archaeological assessment, where required.

For this Stage 1 archaeological assessment, WSP:

- Contacted the MCM to query the *Ontario Archaeological Sites Database* for all registered archaeological sites within a 1-kilometre (km) radius of the study area.

- Searched the *Ontario Public Register of Archaeological Reports* for reports that detail archaeological assessments conducted within a 50-metre (m) radius of the study area.
- Analyzed the study area's physical characteristics, principally its proximity to water sources, elevated topography, well-drained soils and sediments, distinctive land formations, and resource areas to determine its archaeological potential for pre- and post-contact period archaeological resources.
- Reviewed historical maps and other archival sources to determine the study area's archaeological potential for post-contact period archaeological resources.
- Reviewed confidential Traditional Knowledge studies prepared for the Project.
- Conducted a helicopter fly-over to document existing conditions and identify areas of archaeological potential.
- Recommended appropriate field-testing strategies for areas identified to have archaeological potential, where applicable.
- Prepared a draft report describing the results of the Stage 1 archaeological assessment with recommendations for further archaeological work, where required.
- Prepared a final Stage 1 archaeological assessment report addressing comments received from Wabun Tribal Council, Taykwa Tagamou Nation, and the MNO.

2.0 ARCHAEOLOGICAL CONTEXT

2.1 A Cultural History for Northern Ontario

In early archaeological syntheses, the Indigenous cultures of northern Ontario were often described as isolated and conservative, a response to the harsh environment and limited resources (Dawson 1983a, b). Today, however, archaeologists recognize northern Ontario's cultural history as dynamic, both influenced by and influencing developments to the south and west (Hamilton 2013:81; Fagan 2019:193). The following provides a brief overview of the Indigenous heritage in the boreal forests of the Canadian Shield from those following the receding glaciers to the fur trade at contact with Europeans. In this summary, the "periods" that archaeologists have defined from material culture found in a specific time or place is substituted with "way of life" to reflect the direct Indigenous lineage from those living in the earliest periods to the present day (Julien *et al.* 2010).

Around 10,000 years ago, hunter-gatherers following the Plano way of life (Table 2.1) began moving into northern Ontario, following the foraging herds of bison, muskox, moose, elk, caribou, and deer as well as smaller mammals such as muskrat and beaver attracted to the freshwater lakes and tundra grasses left in the wake of the receding Laurentide Ice Sheet (Brose *et al.* 2021:24; Hamilton 2013:84). To hunt these animals, the Plano used lance-shaped stone projectile points hafted to wood spears, then used large stone scrapers and knives to cut the meat and bone and clean hides (Hamilton 2013:84). Plano-type tools are remarkably similar across large areas, although there are local variations identified in northern Ontario called the Lakehead and Interlakes Composite complexes (Hamilton 2013:85; Langford 2018:28-29). The few known Plano sites suggest these people were highly mobile and favoured lakeshores or the high ground near rivers (Hamilton 2013:85).

As Plano interaction with their surroundings and neighbours increased around 8,000 years ago, they developed local traditions and practices known as the Pre-ceramic or Archaic way of life (Table 2.1) (Sassaman 2010). In northern Ontario, the Pre-ceramic or Archaic toolkit is thought by some to represent a unique "Shield Archaic" culture descended from Plano people moving south from present-day Nunavut, but today the Pre-ceramic or Archaic way of life on the Canadian Shield is understood to have been influenced from developments to the south and may not be that different from other Pre-ceramic or Archaic lifeways (Wright 1972a; Hamilton 2013:87, Langford 2018; Fagan 2019:195). However, Shield Archaic remains a useful label because it typifies the larger developments in the Pre-ceramic or Archaic. Like their Plano ancestors, Shield Archaic people lived in widely dispersed bands of foragers, but their local knowledge meant they could restrict their annual round to a smaller area and both their economy and material culture were more diverse (Fagan 2019:182). Pre-ceramic or Archaic projectile points became shorter through time and made with distinctive side-notches, and there were a range of single- and double-bladed stone knives, endscrapers, and sidescrapers (Clark 1991:99). Whetstones and adzes suggest Pre-ceramic or Archaic people were shaping bone and wood, respectively, and the presence of archaeological sites on islands and along waterways suggests people were using snowshoes and watercraft (McMillan & Yellowhorn 2004:104).

Another key development during the Archaic was copper mining and manufacture. As early as 6,000 years ago, Pre-ceramic or Archaic people had found copper sources in the upper Great Lakes and used it to create implements such as socketed lance heads and knives, adzes and fishhooks, as well as decorative items such as bracelets and disc pendants (Hamilton 2013:88; Langford 2018:25; Wright 1972: 20, 34). Copper was also widely traded, with some making its way to the Indian Knoll Archaic site in Kentucky (Fagan 2019:187).

People living north of Lake Huron and Lake Superior adopted ceramics around 2,200 years ago, during what is known in southern Ontario as the Middle Woodland Period, but in northern Ontario is termed the Initial Woodland (Table 2.1) (Hamilton 2013:89). Despite this marked shift in material culture, known as the Laurel tradition, archaeologists have not found evidence that pottery made a major impact to those continuing a Pre-ceramic or Archaic way of life across most of the region (McMillan & Yellowhorn 2004:104). The same is true of the bow and arrow, which first appear on Laurel tradition sites. It is unclear whether archery was a distinctly Laurel hunting adaptation or practiced much earlier since the bone and wood used to make bows and arrows generally does not survive in the boreal forest conditions (Clark 1991:102-102,133). However, for those following a Laurel way of life west of Lake Superior, adopting pottery does appear to have caused a significant shift in their economic and spiritual existence. In addition to greater reliance on foraging plants such as wild rice, the Laurel way of life as it developed into the Terminal Woodland Period west of Lake Superior included farming maize, establishing extensive trade networks, and building large ceremonial burial mounds that may have been influenced by the Hopewell culture far to the south (Hamilton 2013:92). Although farming and mound building was not pursued north and northeast of Lake Superior and Lake Huron, there is evidence in the form of copper, obsidian, exotic cherts, and other goods found on northern sites—as well as northern minerals and metals uncovered at southern Middle Woodland sites—that Laurel people living across the northern boreal forest were active participants in the Hopewell sphere (Brose et al. 2021:28).

The Terminal Woodland way of life (Table 2.1) in the western Canadian Shield is defined by changes in pottery types, which are assumed to correspond to the linguistic and cultural diversity seen in the contact and post-contact periods (McMillan & Yellowhorn 2004:106; Hamilton 2013:94). Blackduck ceramics, thought to have developed from the Laurel way of life and used by the ancestors of the Anishinaabeg, are found across the Shield in Ontario and into Manitoba and Québec (Côté and Inksetter 2009) while further north is Selkirk type pottery, used by people who would become known as Cree (McMillan & Yellowhorn 2004:106-107). However, these direct lineages are complicated by Sandy Lake pottery (thought to have been made by Siouan speaking people) found in the Blackduck area, sites in northern Ontario where both Blackduck and Selkirk wares have been recovered, and ancestral Cree sites that lack pottery altogether (Hamilton 2013:94; McMillan & Yellowhorn 2004:107).

In contrast to earlier ways of life, far more material evidence survives from the Terminal Woodland and includes not only hunting tools such as barbed bone harpoons, but also stone pipes and amulets with imagery linked to religion (McMillan & Yellowhorn 2004:106). In the Blackduck (known at contact as Anishinaabe) way of life, religious beliefs are also reflected in the low burial mounds found west of Lake Superior and the pictographs created in red ochre on numerous rock outcrops across northern Ontario (McMillan & Yellowhorn 2004:106-107; MCR 1980; Conway 1981).

Table 2.1 Simplified Cultural Chronology of Northern Ontario (based on Munson 2013:13)

Period	Way Of Life
Plano (c. 9,500–8,000 Years B.P.)	Big game hunting over large areas. Lakehead and Interlakes Composite complexes (c. 8,500-8,000 B.P) in upper Great Lakes.
Shield Archaic (c. 8,000-2,200 B.P.)	Greater knowledge of local resources allows for smaller area covered during seasonal round. Diverse hunted and foraged diet. Watercraft and snowshoes introduced. Old Copper Complex (6,000 – 3,000 B.P.) in upper Great Lakes that included long distance trade.
Initial Woodland (c. 2,200–1,300 B.P.)	Laurel based on introduction of pottery, but Archaic hunter-gatherer lifeway continues. Develops to include maize agriculture and mound building in the Late Woodland.
Terminal Woodland (700-1650 Common Era [C.E.]	Sandy Lake (1200-1750 C.E.) in upper Great Lakes. Blackduck (700-1100 C.E.) generally north of Sandy Lake area. Ancestral Anishinaabe. Burial mounds and pictographs. Selkirk (700-1750 C.E.) generally north of Blackduck area. Ancestral Cree.

2.2 Registered Archaeological Sites

To register archaeological sites in the Ontario Archaeological Sites Database, the MCM uses the “Borden system” developed in 1952 by University of British Columbia archaeologist Charles Borden (Borden 1952). The Borden system divides Canada into grid blocks based on longitude and latitude, with each Borden block measuring approximately 13 km east-west by approximately 18.5 km north-south. Each Borden block is referenced with a four-letter designation, with sites found within each block numbered sequentially as they are registered.

The study area is located within the *DfHi*, *DfHh*, *DeHi*, *DeHh*, *DdHi*, and *DdHh* Borden blocks. Correspondence with the MCM on October 25, 2021 and 4 November 2021 and a search of the *Ontario Archaeological Sites Database* on July 25, 2024 determined there are no registered archaeological sites located within the study area and no registered archaeological sites are located within a 10-km radius of the study area. The nearest registered archaeological site is over 12 km east of the study area (MCM 2024a, 2024b).

It is important to note that an absence of registered sites near a study area does not necessarily imply the area was not occupied in the past, but instead may indicate that previous archaeological surveys of the area have been limited, or that extensive land alterations has destroyed evidence of earlier human occupation.

One Traditional Knowledge study prepared for the Project documented a “historically significant site” in the northwest portion of the study area. No details about the site are known, except that it had been recorded in 2018 as on the west side of Highway 655, near a sideroad that “heads west toward the Camp 40 road and the North Driftwood River.” A precise location for this site was not provided in the Traditional Knowledge study, and the general location has not been mapped in this report to respect the wishes of Indigenous communities.

2.3 History of Archaeological Investigations

WSP’s search of the *Ontario Public Register of Archaeological Reports* administered by the MCM determined that six archaeological assessments have been conducted within the study area (Table 2.2). Two of these assessments (WHS 2009; ASI 2024) extend 50 m beyond the study area. Table 2.2 lists the reports in the *Ontario Public Register of Archaeological Reports* that detail archaeological assessments conducted within the study area, and each is described in greater detail below. Appendix A: Figure 5 shows the location of these previous studies.

Table 2.2 Archaeological Reports Detailing Assessments Conducted within the Study Area

Year	Title	Author	PIF
2000	Archaeological and Heritage Impact Assessment, Highway 655 – From Junction with Hwy. 11 south for 27.5 km, Ontario Ministry of Transportation, MTO Agreement # PO 5005-A-000052 for W.P. 112-98-00, and W.P. 224-99-00.	Woodland Heritage Services Ltd. (WHS)	CIF 99-011-049
2001	Stage 1 Archaeological Assessment of Proposed Highway 655 Rehabilitation and of Improvements to Truck Lay-by Areas on Highway 655 and Highway 101, Cochrane District, Ontario (MTO W.P. 113-98-00 and W.P. 225-99-00)	Heritage Quest Inc.	CIF 2001-033-009
2003	Stage 2 Archaeological Assessment, Highway 655, Jocko Creek Crossing 30.4 km North of Highway 101, Carnegie Township, Ontario (MTO W.P. 113-98-00)	Jacques Whitford Environment Limited (JWEL)	CIF 2002-022-007
2009	Stage 1 Project Report: Post Development Assessment of the Kidd Creek Mine Impact on Archaeological and Cultural Heritage Sites	WHS	P016-217-2008
2013	Stage 1 and 2 Archaeological Assessment, Highway 655 Jocko Creek Crossing Rehabilitation, Lot 2, Concession 2, Carnegie Township, District of Cochrane, Ontario	Stantec Consulting Ltd.	P002-306-2012
2024	Stage 1 Archaeological Assessment Wood Pole Replacement Program 2024: Timmins Circuit (Geographical Townships of Dyer, Morrow, Hobson, Valentine, Kilmer, Hamlet, Pitt, Kidd, Wark, Tisdale, Whitney, and Hoyle), City of Timmins, District of Cochrane	Archaeological Services Inc. (ASI)	P1066-0370-2023

- *Archaeological and Heritage Impact Assessment, Highway 655 – From Junction with Hwy. 11 south for 27.5 km, Ontario Ministry of Transportation, MTO Agreement # PO 5005-A-000052 for W.P. 112-98-00, and W.P. 224-99-00.* Prepared for FRI Ecological Services by Woodland Heritage Services Limited and Settlement Surveys Ltd., January 11, 2000, Proj. No. 99-65 (CIF No.: 99-011-049)

To support rehabilitation of the northern portion of Highway 655, Woodland Heritage Services Ltd. (WHS) conducted a Stage 1 and 2 archaeological assessment. The assessment's study area included the right-of-way of Highway 655 between the north border of Crawford Township and Highway 11. After visual survey of the entire corridor, WHS identified areas of general archaeological potential at three crossing sites more than 10 km north of the current study area, two in the north portion of Crawford Township and one in Lennox Township. At these locations WHS conducted Stage 2 test pitting at judgemental intervals but encountered no archaeological resources (WHS 2000:14). Consequently, WHS (2000: 14) recommended no additional archaeological assessment or mitigative measures as part of the Highway 655 rehabilitation project.

- *Stage 1 Archaeological Assessment of Proposed Highway 655 Rehabilitation and of Improvements to Truck Lay-by Areas on Highway 655 and Highway 101, Cochrane District, Ontario (MTO W.P. 113-98-00 and W.P. 225-99-00).* Prepared for Jacques Whitford Environment Limited by Heritage Quest Inc., July 27, 2001, Proj. No. HQ2001-05 (CIF No.: 2001-033-009).

In 2001, Heritage Quest Inc. conducted a Stage 1 archaeological assessment to support rehabilitation of the southern portion of Highway 655 and to improve truck lay-bys on Highway 655 and Highway 101. The assessment's study area included 26.4 km of Highway 655, all within the current study area. After conducting a property inspection, Heritage Quest Inc. concluded that the only area of general archaeological potential was at the Jocko Creek crossing, and for this location recommended Stage 2 test pitting at 5 m intervals prior to any ground disturbance beyond the highway's ditches and within a zone 200 m north and south of the crossing (Heritage Quest Inc. 2001:20).

- *Stage 2 Archaeological Assessment, Highway 655, Jocko Creek Crossing 30.4 km North of Highway 101, Carnegie Township, Ontario (MTO W.P. 113-98-00).* Prepared for Stantec Consulting Ltd. by Jacques Whitford Environment Limited, April 7, 2003, Proj. No. ONT 50225 (CIF No.: 2002-022-007).

Following recommendations of the Heritage Quest Inc. (2001) Stage 1 archaeological assessment, Jacques Whitford Environment Limited (JWEL) conducted a Stage 2 property assessment at the Jocko Creek crossing, in the south-central portion of the current study area. JWEL excavated 40 cm by 40 cm test pits at 5 m intervals within a 30 m wide area in the southeast quadrant of the crossing but encountered low and wet conditions and ceased testing the area after excavating 15 test pits (JWEL 2002:6-7). JWEL found evidence of extensive disturbance from heavy machinery in the northeast quadrant, though could excavate 19 test pits in 5 m intervals in areas outside the disturbance. At the southwest quadrant, 25 test pits were completed on a staggered 5 m interval, while in the northwest judgemental sampling on areas of level ground was conducted with a total of 19 test pits (JWEL 2002:8-9). No artifacts were recovered from any of the test pits; JWEL therefore recommended that no further archaeological assessment be required prior to construction (JWEL 2002:9).

- *Stage 1 Project Report: Post Development Assessment of the Kidd Creek Mine Impact on Archaeological and Cultural Heritage Sites.* Prepared for AMEC Earth & Environmental by Woodland Heritage Services Ltd., January 9, 2009, Proj. No. J2008-37 (PIF# P016-217-2008).

In 2008, WHS conducted a Stage 1 archaeological assessment of the past and current footprint (1960s to 2008) of the Kidd Creek Mine. WHS' background study determined that some areas within the Kidd Creek Mine footprint had not been impacted by mining activities and defined three areas of "high" archaeological potential in the "pre-mine development area" (WHS 2009:26-27). One of these areas (Area 3, Sand Pit) is within the current study area and was identified as having archaeological potential for its elevated topography and pockets of sandy soil (WHS 2009:23). Despite identifying archaeological potential, the WHS report made no recommendations for further assessment within Area 3, nor the other two areas, which follow the East Kidd and Middle Kidd creeks.

- *Stage 1 and 2 Archaeological Assessment, Highway 655 Jocko Creek Crossing Rehabilitation, Lot 2, Concession 2, Carnegie Township, District of Cochrane, Ontario.* Prepared for McIntosh Perry Consulting Engineers by Stantec Consulting Ltd., January 22, 2013, Proj. No. 122510738 (PIF# P002-306-2012).

As part of a full rehabilitation of the Jocko Creek crossing to replace the original 1970 and 2004 culvert sections, Stantec Consulting Ltd. (Stantec) conducted a Stage 1 and 2 archaeological assessment. Although archaeological concerns for the crossing had been partially addressed through JWEL's 2002 Stage 2 property assessment (JWEL 2002), the proposed works for the culvert rehabilitation extended beyond JWEL's 2002 study area. To investigate the expanded study area, test pitting and pedestrian survey was conducted in August 2012 in 20 m wide by 150 m long transects placed at the crossing's four quadrants (Stantec 2013:6). Within 50 m of Jocko Creek the testing was at 5-m intervals, while the remainder was tested at 10-m intervals. Since none of the test pits identified archaeological resources, Stantec recommended that no further work be required (Stantec 2013:7).

- *Stage 1 Archaeological Assessment Wood Pole Replacement Program 2024: Timmins Circuit (Geographical Townships of Dyer, Morrow, Hobson, Valentine, Kilmer, Hamlet, Pitt, Kidd, Wark, Tisdale, Whitney, and Hoyle), City of Timmins, District of Cochrane.* Prepared for Hydro One Networks Inc. by Archaeological Services Inc. (ASI), January 29, 2024, Proj. No. 23EA-185 (PIF# P1066-0370-2023).

To inform Hydro One's planning to replace wood utility poles on its Timmins Circuit transmission line, ASI was commissioned in 2023 to conduct a desktop Stage 1 Archaeological Assessment for seven line sections. One of these sections—the Warkus JCT - Kidd Minesite line section—is within the south portion of the current study area and runs east from Kidd Mine to end in the hydro corridor east of Highway 655. Overall, the Warkus JCT - Kidd Minesite line section covers 12.9 ha, of which approximately 4 ha is within the current study area. ASI evaluated most of the Warkus JCT - Kidd Minesite line section to be either disturbed or have low archaeological potential but recommended that a property inspection be conducted to confirm the extent of disturbance and the presence or absence of features of archaeological potential (ASI 2024:37-38).

2.4 Environmental Context

The study area (Appendix A: Figure 1, Figure 2, and Figure 3) is situated in the south portion of the Canadian Shield, in the Abitibi Upland subregion of the James physiographic region (Dredge and Cowan 1989). On the north and west, the Abitibi Upland extends to the Hudson Bay Lowland, while on the east it extends into Quebec and borders the Laurentian Highlands. The Abitibi Upland is underlain by Pre-Cambrian gneisses, granites, metasedimentary and metavolcanic rocks, with surface material in the study area of silty and clayey till or glacial lake deposits of mainly clay, as well as surface features such as eskers, moraines, and ice flow lineation (Dredge and Cowan 1989:217). These surface features were created when the glaciers and associated glacial Lake Barlow-Ojibway advanced and retreated, with ice-free areas appearing in the study area by around 10,000 years ago (Sims and Baldwin 1991:7). A small section of beach ridge formed by glacial Lake Barlow-Ojibway survives in the southeast portion of the study area (OGS 2005) (Appendix A: Figure 6).

Today, the study area is primarily wooded with a low and undulating topography and since it is within the Southwestern Hudson Bay watershed, this topography trends to higher elevation in the south, with the west portion within the Missinaibi and Mattagami River secondary watershed, and the east and north portions within the Abitibi River secondary watershed. An esker—formed as sediment deposited within a glacial meltwater tunnel then exposed on the surface as the glacier receded—runs north/south through the central-west portion of the study area at approximately 290 m above sea level (Appendix A: Figure 3).

As many as eight soil types are within the study area. In the north, these include poorly drained Ford orthic humic gleysol (silt loam to silty clay loam calcareous till) and Harley Fibric Mesisol (fibric over mesic organic material more than 160 cm thick), while in the central portion of the study area is moderately poorly drained Audrey Orthic Humic Gleysol (silt loam to silty clay loam calcareous till). In the south is the poorly drained Sunstrum Terric Mesisol (mesic organic material 4-160 cm thick over mineral soil) and Larder Typic Humisol (humic organic material more than 160 cm thick) (Land Resource Research Institute 1978).

The study area is within the Lake Abitibi Eco-region, which supports a wide range of mammal species including moose, black bear, grey wolf, lynx, and beaver, bird species that include common loon, bald eagle, geese, spruce grouse, and raven, and fish species of brook trout, sturgeon, whitefish, northern pike, walleye and yellow perch (Crins *et al.* 2009:25). It is characterized as boreal forest of primarily coniferous tree species such as black and white spruce and jack pine (Crins *et al.* 2009:25). However, wetland communities with species of *Populus balsamifera*, *Populus deltoides*, and *Populus tremuloides* (often referred to as aspen or poplars by non-specialists) cover over 70% of the study area (WSP 2024). Traditional Knowledge studies prepared for the Project have documented the diversity of mammal, bird, and fish species that are harvested in the study area, and have identified that berries, birchbark, and floral species used as medicines are collected in the study area.

One of the most important factors influencing human land use is proximity to water. The *Standards and Guidelines for Consultant Archaeologists* (MCM 2011) lists the presence of water sources as a key indicator of archaeological potential since potable water is critical to human and animal life, and because lakes and waterways have enabled movement of people and goods in the pre- and post-contact periods. In the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), potential for pre- and post-contact archaeological sites in northern Ontario is considered high for lands within 50 m of an extant or historical primary or secondary water source. Primary water sources are defined as lakes, rivers, streams or creeks, while secondary sources include intermittent streams and creeks, springs, marshes, and swamps.

Primary water sources with numerous tributaries and secondary water sources are located throughout the study area, all in the primary watershed of Southwestern Hudson Bay. In the north and east, the North Driftwood River and West Buskegau River are within the Abitibi River secondary watershed and those in the south —Jocko Creek and Kidd Creek and tributaries— are in the Missinaibi River and Mattagami River secondary watershed. Also within the study area are eight named lakes; from north to south these are Martin Lake, Gerry Lake, Jack Lake, Sutherland Lake, Mel Lake, Zed Lake, Boundary Lake, and Feldman Lake (Appendix A: Figure 2 and Figure 3).

3.0 HISTORICAL CONTEXT

3.1 Review of Historical Records

At contact with Europeans in the early 17th century, northeastern Ontario was home to a diverse number of Anishinaabeg Ojibwe, Nipissing, Odawa, and Algonquin groups as well as Cree (Native Land Digital 2023; Bishop 1994a:276). Anishinaabeg and Cree groups had a varied diet of moose, deer, and bear, several fish species, and plant foods such as maple sap, berries, and wild rice (McMillan & Yellowhorn 2004:110-111). To access these resources, the Anishinaabe and Cree had to be seasonally mobile, which determined the form and materials of their lightweight wigwam housing and a reliance on birchbark canoes (McMillan & Yellowhorn 2004:112).

To French traders, northeastern Ontario was part of the vast *pays d'en haut* (the “Upper Country”) while for the English it was within Prince Rupert’s Land, a region defined by the Hudson Bay watershed that the Crown had established in 1670 as part of its charter for the Hudson Bay Company (HBC). Though limited and unsupported by the colonial government, French commercial expansion into northern Ontario was more successful than English efforts because it was based on knowledge of Indigenous languages and kin networks (Berthelette 2022:66). In contrast, an English presence in the area through the late 17th to early 18th centuries was limited to isolated trading posts near the river mouths on the coasts of Hudson Bay and James Bay, and this peripheral influence continued in northeastern Ontario even after the fall of New France and 1763 Peace of Paris, when the HBC could expand their operations into the former French territories (Nassaney 2015:55). A sustained French presence in the north after 1763 also led to *métissage*, Indigenous-French exchanges in material culture, beliefs, lifeways, kinship, and partnerships from which emerged a distinct cultural identity known as Métis (Berthelette 2022:223). This identity included a common language of *Michif*, a combination of French and Cree (McMillan & Yellowhorn 2004:302).

From the second half of the 18th century onward, Anishinaabeg, Cree, and Métis groups were spending a greater part of the year near the Hudson Bay Company (HBC) and the North West Company (NWC) “factories”, both supporting the traders with a wide range of supplies beyond furs—birchbark canoes, caribou meat, pemmican, even wild rice—and transporting goods over hundreds of kilometres (Bishop 1994b:292; Supernant 2018). Archaeological research on the critical role of Métis communities in the history of the fur trade in Ontario is severely limited, with most investigations focused primarily on either the trading posts or overwintering or *hivernant* sites in the north-central United States and Canadian Prairies (Supernant 2018; Nassaney 2015: 130-131). However, as Supernant (2018) has shown, artifact assemblages from Métis sites often reflect a selective integration of certain European-produced goods, such as a high number of glass-blown beads.

By the late 18th century, depleted fur supplies and competition from other fur trading companies forced the HBC to establish new posts further inland (Arthurs 1980:38) (Appendix A: Figure 7). This shift in policy was initially explored with the Albany and Moose-Missinainbi River systems, the latter of which includes the Mattagami River. Wapiscogamy House, approximately 290 km northwest of the study area, was the first inland post established on the Moose-Missinainbi system in 1776 and was followed by other posts on the Missinaibi River as far south as Missinaibi Lake, approximately 240 km east of the study area from the late 18th and into the early 19th century (Arthurs 1980:38). At the same time, the HBC established the Frederick House post on the Frederick House River, approximately 40 km east of the study area, in 1785 to counter the NWC presence on Lake Abitibi to the east and Flying Post to the west (OHT 2022). Competition between the HBC and NWC often escalated to violence—several people at the Frederick House post were murdered in 1813—but this ended in 1821 when the HBC acquired the NWC (Bishop 1994b:293; OHT 2021a). The same year, the HBC abandoned Frederick House, but retained administration of the area as the “Moose” fur trade district through the 1830s (Rogers 1994:308).

Euro-Canadian incursions into the area were sporadic through the remainder of the 19th century and principally connected to the fur trade and forestry. However, with the transfer of Rupert's Land into the Dominion of Canada in 1870 and improved rail communications, prospectors and non-Indigenous traders were drawn to the area, a development viewed with concern by Cree (Omushkegowuk) and Anishinaabeg communities, who lobbied for formal land agreements to protect their territories and natural resources (MPBSD 2015). However, when the James Bay Treaty (Treaty No. 9) was finally drafted in 1905, it was primarily an agreement between the Canadian and Ontario governments for mining, timber, rail, and hydro-electric interests. None of the Treaty was translated into Indigenous languages and it was presented to the affected communities during the Treaty Expedition as a final document with no opportunity for further negotiation. Additionally, the Treaty commissioners made verbal promises that Indigenous interests would be protected even though this was clearly misleading as non-Indigenous development within the Treaty lands continued apace (MPBSD 2015). Despite these government efforts at assimilation and settlement through 19th and 20th centuries, many Anishinaabe in northwestern Ontario continue their traditional land use, cultural and belief systems, and artistic expression.

A major incursion into the Treaty lands was the Porcupine Gold Rush, set off in 1909 by the discovery of large gold ore bodies at present-day Timmins by Jack Wilson (Dome Mine) and Benny Hollinger and Alec Gillies (Hollinger Gold Mine) (Torlone 1979:16-17). Despite a devastating fire in 1911 that destroyed the mine operations and may have killed as many as 200 people, by 1 January 1912 the town of Timmins had been incorporated with 600 residents (Torlone 1979:18-19). By this time, the initial surveys for Nesbitt, Beck, Mahaffy, Crawford, Lucas, Carnegie, Prosser, Kidd and Wark Townships were underway in what was initially the District of Sudbury, then District of Timiskaming, and now District of Cochrane (Stantec 2013:5) (Kidd and Wark Townships were incorporated into the City of Timmins in 1973, see Rayburn 1997:344).

To power the extensive mining operations in Timmins, private companies built dams, storage lakes, and hydro-electric plants, with the first at Sandy Lake by the Hollinger Syndicate in 1911 and followed by Northern Canada Power's Lower Sturgeon Generating Station west of the study area in 1923 (Manore 1995:159). By 1927, Cochrane (northeast of the study area) was linked by road to North Bay, enabling further development in the area (MTO 1984:65). The transmission line through the study area had been erected by 1954 (Heritage Quest Inc. 2001:11).

In 1964, an Archean volcanogenic massive sulphide deposit containing over 150 million tons of copper and zinc ore, the largest such deposit in the world, was discovered on Kidd Creek in the southwest portion of the study area (Berger *et al.* 2011:1). Open pit excavations to access the deposit, known as the Kidd Creek Mine, began in 1966 and spurred infrastructure in the surrounding area, beginning with the southern section of Highway 655 between the mine and Highway 101 in 1966, the Ontario Northland Railway in 1969, and the northern extension of Highway 655 through the study area and terminating at Highway 11 from 1975 to 1978 (Bever 2014). Forestry was also active throughout the study area during the second half of the 20th century and continuing into the 21st century.

Historical records and mapping were searched for evidence of post-contact period archaeological evidence within the study area. Like previous archaeological and cultural heritage studies (see Section 2.3), no maps could be identified of sufficient scale to identify historical features in the study area. An inquiry to the City of Timmins Museum also did not identify visual sources that would be useful for analysis of the study area (Dubeau 2022: pers. comm). Maps of the area before 1870 were primarily focussed on Canada West, south of the Rupert's Land boundary, while those dating to the late 19th century and early 20th century were drawn at large scale except when depicting the core of major northern communities such as Timmins.

In addition to mapping, the *Abandoned Mine Information System (AMIS) Database* maintained by the Ministry of Mines was searched for indications of historical mining activities in the study area. Apart from post-1964 features associated with the Kidd Creek Mine, no abandoned mines are recorded within the study area, with the nearest ones located over 20 km to the south and west of the study area.

3.2 Commemorative Plaques and Heritage Properties

Section 1.3.1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011) notes that features or characteristics of archaeological potential can be identified through the presence of: commemorative markers, monuments, or heritage parks; properties listed on a municipal register or designated under the *Ontario Heritage Act*; federal, provincial, or municipal historic landmarks or sites; and properties that local histories or informants have identified with possible archaeological sites, historical events, activities, or occupations.

Search of the *Ontario Heritage Trust Plaque Database* and *Ontario Heritage Act Register* indicated that no historical plaques or heritage properties are located within a 1-km radius of the study area (OHT 2021a, b).

3.3 Recent Land Use History

A review of historical documentation, previous archaeological reports, and Google Earth satellite and aerial imagery dating from between 1984 and 2020 indicates that several extensive and deep land alterations in the study area severely damaged the integrity of archaeological resources in portions of the study area (Appendix A: Figure 2 and Figure 8). These include:

- Construction for the Lower Sturgeon Generating Station in the west extent of the study area in 1923.
- Establishing the two transmission line corridors that run north-south through the study area in the early 1950s.
- Initiating and expanding the Kidd Creek Mine operation and laying associated roads in the south portion of the study area beginning in the mid-1960s.
- Building the Highway 655 right-of-way through the centre of the study area from the mid-to-late 1970s.
- Logging and forestry operations through the second half of the 20th century and into the 21st century that involved mechanized clearing and grubbing and laying numerous access roads throughout the study area.

Several published sources (e.g., Wildesen 1982; Dalla Bona 1999; Hamilton 2000; Gibson 2019; Bereziuk *et al.* 2021) including the Ministry of Natural Resources (MNR) *Forest Management Guide for Cultural Heritage Values* (MNR 2007), have outlined the extent, severity, and duration of impacts on archaeological sites from forestry operations. Hamilton (2000:41-43), for example, has noted that “Modern forest harvest and regeneration practices can cause significant damage to archaeological and other heritage resources. This derives from the large scale of mechanized harvest operations, the road-based transportation infrastructure, and reforestation involving scarification.”

Although current forestry practices and management have aimed to reduce these impacts, timber harvest in the study area was established by Abitibi as early as 1930 (Abitibi River Forest Management Inc. 2022). Prior to 1988, harvesting in the Abitibi River Forest Management area was done in congregations of larger blocks, which created large disturbance patches. This changed after release of the MNR’s *Timber Management Guideline for the Provision of Moose Habitat* (1988), which prescribed the size and rate of occurrence of different cutover sizes in the Abitibi River Forest Management Area and directed the cutting of an increased amount of smaller blocks and a decreased amount of large blocks in the forest, causing fragmentation and expanded disturbed areas. Due to this long history of forestry, some portions of the study area are likely to have been subjected to at least two harvesting and planting events and associated land disturbance.

3.4 MNR Heritage Assessment Tool

The MNR developed the Heritage Assessment Tool (HAT) to model archaeological potential for forestry management units across northern Ontario. A key variable in the modelling is proximity to water, with archaeological potential identified for a 50-m wide zone associated with major rivers and ponds in the study area. However, this modelling is often based on recent raster imagery or other contemporary hydrographic conditions, not those documented in earlier mapping and satellite and aerial imagery. HAT modelling is not intended to be an archaeological master plan.

On October 21, 2021, WSP contacted Renée Bellini, Cultural Heritage Specialist at MNR, to request the Abitibi River Forest management unit archaeological potential modelling and was provided with shapefiles on October 29, 2021. This modelling plots areas of archaeological potential within the study area yet in some cases omits potential in areas surrounding named lakes and sections along major watercourses such as the lower Jocko Creek. Since the Project is not related to forest management, the HAT archaeological predictive modelling was considered but not reproduced in this report.

3.5 Archaeological Potential Modelling

To identify zones within the study area with higher probability to be associated with human land use and corresponding archaeological resources, WSP generated a GIS archaeological potential model based on proximity to optimal water sources, elevated topography, vegetation type, and drainage. The data sources used for this modelling included:

- 2023 Ontario Hydro Network (OHN) watercourse, waterbody, and wetland mapping accessed through the Land Information Ontario (LIO) Geohub
- Abitibi River Forest Resource Inventory (FRI) mapping
- Ministry of Mines Northern Ontario Engineering Geology Terrain Study (NOEGTS) mapping
- Light detection and ranging (LiDAR) imagery available for the east portion of the study area
- Seasonably navigable watercourse mapping provided by CNC

The Appendix A: Figure 9 map series shows the archaeological potential model generated from large-scale GIS datasets listed above. The Appendix A: Figure 10 map series shows the archaeological potential model as refined by the results of the helicopter flyover (see Section 4.2).

Although general proximity to primary and secondary water sources is listed as an indicator of archaeological potential in the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), for northern Ontario this presents a challenge due to the abundance and broad range of water sources, from intermittent brooks and swampland to large lakes and wide, fast flowing rivers. Small watercourses and inundated areas are known to be used by Indigenous groups to gather animal and plant resources that favour wetlands, such as waterfowl and wild rice, but archaeological research in the region has assumed—despite the risks of overemphasizing certain site locations—that the larger and permanent waterbodies and fast flowing watercourses were preferred by human groups since they tend to attract game species, support fish populations, provide higher quality and consistent potable water, and in winter offer flat and tree-less corridors to traverse the landscape (Julig and Long 2021: 20-21; Hamilton 2000:45; Dalla Bona 1999).

WSP's archaeological potential model for proximity to primary and secondary water sources is therefore based on stream order. Stream order developed in hydrology as a means to create a hierarchy of tributaries within a river system, from low concentration and largely overland flow in an outer tributary to the high volume, high velocity flow within a main channel. A number of ways to define stream orders have been proposed. One is the Strahler method, which assigns a relative numerical value to each branch of a river system: the smallest and outermost tributaries are called "first order" while the higher-flow channel where the first order tributaries merge is referred to as "second order." This relative index increases as the channels reach the main path of a river from third order to globally as high as 12th order. Stream order classification using the Strahler method is available in the data provided by the LIO data.

The WSP model was limited to Strahler third order or higher watercourses, as commonly applied to archaeological potential modelling (e.g., Golder 2018), and—following parameters used for the HAT—identified only those lands within 50 m of third order or higher watercourses as having archaeological potential. This 50 m buffer applied to the large-scale OHN watercourse dataset also captures the confluence of second and third-order streams, which members of Mattagami, Matachewan, and Flying Post First Nations indicated during consultation with CNC are typical locations for camps. While the potential model is based on current watercourse mapping, it can be assumed that the hydrological conditions in the study area are similar to those in the past, given the hard substrate resistant to erosion, and since no flood control measures have been established in the study area apart from a limited zone near the Lower Sturgeon Generating Station on the Mattagami River (Hamilton 2000:50; Connelly and Lake 2006:260-262). WSP's use of Strahler third order or higher exceeds the guidance in the MCM's *Criteria for Evaluating Marine Archaeological Potential: A Checklist for Non-Marine Archaeologists* (MCM 2016), which states that "*Fourth order* [emphasis added] and higher watercourses (on the Strahler scale) have potential association with human activity around narrows, rapids, waterfalls and proximity to waterbodies such as lakes".

In addition to using Strahler third order or higher, WSP modelled potential along the named streams since it was assumed these have some level of potential cultural significance; some of the named streams are lower than third order. At the request of Wabun Tribal Council, archaeological potential was also modelled for stream sections that CNC identified from field studies to be seasonally navigable by canoe (i.e., greater than 2-m wide) but not associated with ecosites associated with low archaeological potential (Supplementary Documentation, Section 1). Archaeological potential was additionally modelled within 50 m of lakes (primary water sources) using the large-scale 2023 LIO waterbody dataset.

The NOEGTS layer contains an evaluation of near-surface geological conditions such as material, landform, topography and drainage, with data including landform type, geomorphology, primary material, secondary material, topography and drainage condition, point features such as sand and gravel pits, sand dunes, drumlins, eskers, landslide scars and index maps to study areas. This dataset was used to identify the esker in the central portion of the study area, the boundaries of which could be refined with WSP's geotechnical analysis (Steven Hales, personal communication 2023). Analysis of available LiDAR (Appendix A: Figure 6) combined with results from WSP's geotechnical investigations (Steven Hales, personal communication 2023) indicate that the beach ridges mapped by the OGS (2005) in the southeast portion of the study area are isolated survivals of glacial Lake Barlow-Ojibway.

WSP used the large-scale Abitibi River Forest FRI mapping and 2023 LIO wetland mapping correlated with WSP's ecological fieldwork and the provincial Natural Heritage Information Centre (NHIC) and Ontario Wetland Evaluation System guidance (OWES Northern Manual) to identify permanently wet areas with low to no potential for archaeological resources. The NHIC assigns a Coefficient of Wetness to vegetation species, which defines the estimated probability for which a species is likely to occur in wetland soils; a "5" indicates the species is "Almost Always in Uplands", a "0" indicates "Found in Uplands and Wetlands", and a "-5" indicates "Almost Always in Wetlands." Similarly, the OWES Northern Manual includes a "Wetland Plant List" that includes species that occur primarily in wetlands (identified as "wetland indicators") as well as those "water tolerant" plant species that can occur in both wetlands and uplands. The three species of *Populus* trees found to cover over 70% of the mixed forest in the study area —*Populus balsamifera*, *Populus deltoides*, and *Populus tremuloides*— are all considered to be swamp-type species in the Wetland Plant List and therefore indicators for permanently wet areas with low or no archaeological potential.

In the Appendix A: Figure 9 map series, the areas that fall outside the buffers are either depicted as low and wet (purple – classified using the FRI mapping) or over 50 m from modern water sources (green). The green areas may in some cases be wooded (as classified in the RFI mapping) but also include other land cover types. The key element is that the areas shaded in green indicate all lands (not just wooded areas) that are not permanently wet and are over 50 m from modern water sources.

As mentioned above, the Appendix A: Figure 9 map series shows the modelled archaeological potential in the study area, while the Appendix A: Figure 10 map series indicates where further archaeological work is required based on the archaeological potential modelling and observations made during the helicopter flyover (see Section 4.0).

4.0 HELICOPTER FLY-OVER

4.1 Methods

Due to the scale and remote location of the study area, an optional pedestrian property inspection was not conducted for this Stage 1 archaeological assessment. However, to gain first-hand knowledge of the study area's geography, topography, and current conditions, evaluate areas of archaeological potential modelled through the Stage 1 background study (see Section 3.5 and Appendix A: Figure 9) and identify and document additional features of archaeological potential, areas of disturbance or permanent saturation (e.g., open and treed muskeg), WSP completed a helicopter flyover survey on 16 and 17 May 2023.

WSP archaeologist William Kearney (R1248) conducted the flyover survey of the entire study area and its periphery from a Bell Jet Ranger III travelling at speeds varying from 50 to 150 km per hour at altitudes between approximately 100 m and 200 m above ground surface. Weather during the fieldwork was overcast and cold with a maximum temperature of 1°C, with southerly wind speeds between 10 and 20 km per hour, but permitted good visibility of land features for both days of the assessment, per Section 1.2 Standard 2 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011).

The survey thoroughly documented areas that were modelled to have archaeological potential within the study area (see Section 3.5), including within 50 m to 150 m on both sides of the watercourses. Field observations were recorded through digital written notes and mapping, and the extensive photo-documentation completed using a Canon EOS Rebel T7 with GP-E2 GPS Receiver.

4.2 Results

The results of the helicopter flyover are provided in the Appendix A: Figure 10 map series, and represent a more refined picture of archaeological potential in the study area than presented in the archaeological potential model created as part of the Stage 1 background study (see Section 3.5 and Appendix A: Figure 9).

Conditions in the study area are typical of the Boreal Shield ecozone, which is characterized by extensive coniferous tree cover in both the rolling terrain of the uplands and the low muskeg scrublands of the lower elevations. Numerous shallow lakes and meandering, stagnant watercourses are scattered throughout the study area, but prominent water sources are the named rivers and a cluster of lakes situated along an esker in the central-south portion of the study area.

Terrain observed surrounding the watercourses in the northern, eastern, and central portions of the study area was typically permanently wet areas of swampy soil (bogs, swamps, muskeg). Permanently wet areas were observed along West Buskegau River, North Driftwood Creek, Jocko Creek, and within 50 m of the smaller water courses (Appendix A: Figure 10; Appendix B: Photographs 1-8, 19-22). When saturated ground conditions were not directly visible from above due to dense tree canopy and brush, wet areas could be identified from the presence of wetland vegetation, primarily *Populus tremuloides*, a species common to swamps in northern Ontario. A few small dry locations along the watercourses indicated archaeological potential, most of them located near modern transportation routes and structures (Appendix A: Figure 10; Appendix B: Photographs 2, 21, 24-25).

Areas of archaeological potential are also located in the central-southern portion of the study area where there is elevated terrain associated with an esker and a cluster of large lakes with sandy shores (Appendix A: Figure 10; Appendix B: Photographs 9, 11-12, 13, 14, 15-18, 26-28).

Despite the general appearance of a naturalized environment, there is evidence in the study area of the extensive and deep land alterations documented in the aerial photographs (see Section 3.3). Extensive land alteration during forestry operations likely damaged or removed archaeological resources within these portions of the study area. Other indications for disturbance are Highway 655, two transmission line corridors that traverse the lands parallel to Highway 655, and activity areas related to logging, mining (Appendix A: Figure 10; Appendix B: Photographs 9, 10, 11, and 13), and access road construction (Appendix A: Figure 10; Appendix B: Photographs 2, 9, 10, 11, 13, 24-25, and 27).

5.0 DOCUMENTARY RECORD

The inventory of documentary records compiled as part of this assessment is provided in Table 5.1.

Table 5.1 Inventory of Documentary Record

Study Area	Map and Photo(s)	Field Notes
WSP E&I Canada Limited 3450 Harvester Road, Suite 100 Burlington, Ontario, Canada L7N 3W5	Copy of one historical aerial photograph, 734 helicopter flyover photographs	One page of written notes, digital photo log and field maps

Documentation related to the archaeological assessment of this project will be curated by WSP until such time that arrangements for their ultimate transfer to His Majesty the King in Right of Ontario, or other public institution, can be made to the satisfaction of the project owner, the MCM, and any other legitimate interest groups.

6.0 ANALYSIS AND CONCLUSIONS

6.1 Potential for Archaeological Resources

Archaeological potential is defined in the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011:163) as the likelihood a study area contains archaeological resources. In land use planning, identifying archaeological potential is used to determine where sites may be found within a study area, and indicate whether time and resources will need to be allocated for archaeological survey and mitigation.

The features and characteristics indicating archaeological potential are listed in Section 1.3.1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011):

- Previously identified archaeological sites.
- Water sources (it is important to distinguish types of water and shoreline, and to distinguish natural from artificial water sources, as these features affect site locations and types to varying degrees):
 - Primary water sources (e.g., lakes, rivers, streams, creeks).
 - Secondary water sources (e.g., intermittent streams and creeks, springs, marshes, swamps).
 - Features indicating past water sources (e.g., glacial lake shorelines indicated by the presence of raised sand or gravel beach ridges, relic river or stream channels indicated by clear dip or swale in the topography, shorelines of drained lakes or marshes, cobble beaches).
 - Accessible or inaccessible shoreline (e.g., high bluffs, swamp or marsh fields by the edge of a lake, sandbars stretching into marsh).
- Elevated topography (e.g., eskers, drumlins, large knolls, plateaus).
- Pockets of well-drained sandy soil, especially near areas of heavy soil or rocky ground.
- Distinctive land formations that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases. There may be physical indicators of their use, such as burials, structures, offerings, rock paintings or carvings.
- Resource areas, including:
 - Food or medicinal plants (e.g., migratory routes, spawning areas, prairie).
 - Scarce raw materials (e.g., quartz, copper, ochre or outcrops of chert).
 - Early Euro-Canadian industry (e.g., fur trade, logging, prospecting, mining).
- Areas of early Euro-Canadian settlement. These include places of early military or pioneer settlement (e.g., pioneer homesteads, isolated cabins, farmstead complexes), early wharf or dock complexes, pioneer churches and cemeteries. There may be commemorative markers of their history, such as local provincial, or federal monuments or heritage parks.
- Early transportation routes (e.g., trails, passes, roads, railways, portages).
- Property listed on a municipal register or designated under the *Ontario Heritage Act* or that is a federal, provincial or municipal historic landmark, or

- property that local histories or informants have identified with possible archaeological sites, historical events, activities or occupations.

The *Standards and Guidelines for Consultant Archaeologists* (MCM 2011) also outline indicators for no or low archaeological potential. These can include areas that are permanently wet or have exposed bedrock or steep slopes, as well as where an area that has undergone extensive and deep land alterations that may have severely damaged the integrity of any archaeological resources (Section 1.3.2, MCM 2011:18, 28). These latter areas have often been “disturbed” through:

- quarrying
- major landscaping involving grading below topsoil
- building footprints; and
- sewage and infrastructure development

However, activities such as agricultural cultivation, gardening, minor grading, and landscaping do not necessarily affect archaeological potential (Section 1.3.2, MCM 2011:28, 18).

6.1.1 Results

The study area has general archaeological potential for pre- and post-contact Indigenous land use. Table 6.1 and Appendix A: Figure 10 summarize the potential for archaeological resources in the study area based on the results of the background study, archaeological potential modelling, helicopter flyover survey, and MCM archaeological potential criteria.

Table 6.1 Summary of Archaeological Potential for the Study Area

Indicators of Archaeological Potential	Yes/No	Description
1. Are archaeological sites located within, or within 300 m, of the study area?	No	<ul style="list-style-type: none"> ▪ No archaeological sites have been registered within the study area or within 300 m of the study area. Additionally, no archaeological sites have been registered within a 10-km radius of the study area. However, Traditional Knowledge studies conducted for the Project indicate that a “historically significant site” is located on the west side of Highway 655 in the northwest portion of the study area. Additionally, the lack of registered archaeological sites in the area may reflect that archaeological surveys in the wider area have been limited.
2. Is there an extant or formerly mapped primary or secondary water source within the study area?	Yes	<ul style="list-style-type: none"> ▪ <u>Primary water sources</u>: five rivers or creeks (Mattagami River, North Driftwood River, West Buskegau River, Jocko Creek, and Kidd Creek) and eight named lakes (north to south: Martin Lake, Gerry Lake, Jack Lake, Sutherland Lake, Mel Lake, Zed Lake, Boundary Lake, and Feldman Lake) are located within the study area. ▪ <u>Secondary water sources</u>: numerous intermittent creeks, seasonal ponds, and bogs are located throughout the study area. Note that these have not been associated with archaeological potential for the purposes of this report.
3. Are there areas of elevated natural topography within the study area?	Yes	<ul style="list-style-type: none"> ▪ An esker runs north-south through the central portion of the study area.
4. Are there pockets of well drained sandy soil in the study area?	Yes	<ul style="list-style-type: none"> ▪ One pocket of sandy soil was previously identified in the south portion of the study area (Area 3, WHS 2009).
5. Are there distinctive land formations in the study area that might have been special or spiritual places, such as waterfalls, rock outcrops, caverns, mounds, and promontories and their bases?	No	<ul style="list-style-type: none"> ▪ Traditional Knowledge studies prepared for the Project do not indicate that there are distinctive land formations in the study area that are known to have been special or spiritual places.
6. Are there archaeologically significant natural resource areas in the study area (e.g., medicinal plants, lithic or metal outcrops, scarce raw materials, or resources associated with post-contact industries)?	Yes	<ul style="list-style-type: none"> ▪ Traditional Knowledge studies prepared for the Project indicate that medicinal plants are collected in the study area.
7. Are there areas of early post-contact settlement in the study area or within 300 m of the study area?	No	<ul style="list-style-type: none"> ▪ No areas of early post-contact settlement are within the study area, nor within 300 m of the study area. Mining activity at Kidd Creek Mine within the southwest boundary of the study area dates to after 1966. The Ontario Northland Railway line, within 300 m of the south extent of the study area, dates to after 1969.
8. Are there early historic transportation routes in the study area or within 100 m of the study area?	Yes	<ul style="list-style-type: none"> ▪ The Mattagami River, at the west boundary of the study area, was used as a transportation route during the post-contact period (Arthurs 1980) and likely also utilized throughout the pre-contact period.

Table 6.1 Summary of Archaeological Potential for the Study Area

Indicators of Archaeological Potential	Yes/No	Description
9. Is there municipally, provincially, or federally listed or designated heritage property or landmarks in the study area?	No	<ul style="list-style-type: none"> No municipally, provincially, or federally listed or designated heritage properties or landmarks are within the study area.
10. Is the study area identified in an Archaeological Management Plan as having general archaeological potential?	Yes	<ul style="list-style-type: none"> The HAT indicates areas of archaeological potential within the study area primarily associated with the main channels of the Mattagami River, North Driftwood River, and West Buskegau River, and sections of Jocko Creek and Kidd Creek. Since the Project is not related to forest management, the HAT archaeological predictive modelling was considered but not reproduced in this report.
11. Are there areas within the study area that are permanently wet, have exposed bedrock, or steep slopes?	Yes	<ul style="list-style-type: none"> LIO wetland mapping indicates that extensive areas within the study area are permanently wet, particularly in the north portion of the study area.
12. Are there areas in the study area that have undergone extensive and deep land alterations that may have severely damaged the integrity of any archaeological resources?	Yes	<ul style="list-style-type: none"> Extensive and deep land alteration occurred as part of the Kidd Creek Mine operation in the southwest portion of the study area. The Lower Sturgeon Generating Station, two transmission line corridors, Ontario Northland Railway, and numerous logging and access roads involved extensive and deep land alteration to construct (WHS 2006). Extensive vegetation clearance evident in recent aerial imagery for the study area would have severely damaged the integrity of any archaeological resources within their development footprint, although the extent of each disturbance is unknown.
13. Has the study area, or portions of the study area, been previously assessed?	Yes	<ul style="list-style-type: none"> Portions of the study area were previously assessed between 2000 and 2023 (Appendix A: Figure 5).
14. Has previous assessment of the study area fully mitigated archaeological resources within the study area?	No	<ul style="list-style-type: none"> Previous archaeological assessments have determined that there is no archaeological potential in the Highway 655 right-of-way (WHS 2000; Heritage Quest 2001; JWEL 2003; Stantec 2013; ASI 2024), nor in areas associated with the Kidd Creek Mine operation (south portion of the study area) (WHS 2009). No archaeological resources have been identified in the study area through previous assessments.
15. Does the study area require additional archaeological assessment?	Yes	<ul style="list-style-type: none"> The undisturbed and locally well-drained portions of the study area within 50 m of the major watercourses and permanent lakes, as well as areas associated with the esker and pocket of sandy soil (Area 3), exhibit general potential for the presence of archaeological resources (Appendix A: Figure 10). If these areas will be impacted by the Project, a Stage 2 archaeological assessment is required.

6.2 Conclusions

Based on the Stage 1 background research, WSP determined that archaeological potential has been removed from approximately 461 ha (2.7%) of the study area (Appendix A: Figure 10). These areas have been disturbed by extensive and deep land alterations that would have destroyed the integrity of any archaeological resources. These areas include the Kidd Creek Mine operation in the south portion of the study area, the transmission line, highway, and rail rights-of-way, and areas disturbed by forestry operations and construction of associated access roads throughout the study area.

An indicator of areas with highly disturbed soils impacted by forestry operations is the presence of *Populus* species, specifically *Populus tremuloides*. *Populus tremuloides* is a successional species that establishes quickly, grows rapidly, and often the first to colonize artificially disturbed zones such as harvested areas, especially in northern Ontario. Overall, the vegetation community in the study area is young, a result of initial timber harvesting in the Timmins area, mining operations established by Abitibi in 1930, and subsequent activities relating to mining, hydroelectric developments, and forestry that have changed the forest composition and structure to what is present on the landscape today. This conclusion is supported in the 2022-2032 Abitibi River Forest Management Plan, which notes that the primary focus is on the conifer harvest, since mature poplar is limited on the landscape. In general, the current condition of the Abitibi River Forest lacks large, contiguous, and denser areas of mature and old forest and large patch sizes. Areas of dense *Populus tremuloides* in the study area are considered young; even if one could find mature areas of *Populus tremuloides*, they represent growth post-1930.

Approximately 11,671 ha (69.3%) of the study area has no or low archaeological potential due to permanently low-lying and wet conditions (Appendix A: Figure 10). Stands of *Populus tremuloides* are also an indicator of these areas, since the species is common in swamps in northern Ontario and not an upland-dependent species.

Per Section 2.1.5, Standard 2 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), approximately 4,117 ha (24.4%) of the study area is over 50 m from a modern water source and not associated with a historic water source such as a glacial shoreline. These areas of low archaeological potential, though not evaluated through Stage 1 property inspection, are in remote locations where there are practical obstacles to achieving access. These obstacles include a lack of available transportation infrastructure (i.e., roads, trails), thick forest, and poorly drained terrain that presents challenges even for tracked vehicles to traverse. Per Section 1.3.4 Standard 1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), these areas are exempt from Stage 2 archaeological survey.

Previous Stage 1 and Stage 2 archaeological assessments concluded that approximately 175 ha (1.0%) of the study area has no or low archaeological potential (Appendix A: Figure 10). These areas are associated with Highway 655 and its Jocko Creek crossing in the central portion of the study area, and the Kidd Creek Mine, in the south portion of the study area.

The remainder of the study area (416 ha or 2.5% of the study area) has general archaeological potential and warrants Stage 2 archaeological assessment in advance of ground disturbance. These areas of archaeological potential include 50 m both sides of the North Driftwood River, West Buskegau River, Jocko Creek, and Kidd Creek and associated permanent tributaries, and within 50 m of the lakeshores of Martin Lake, Gerry Lake, Jack Lake, Sutherland Lake, Mel Lake, Zed Lake, Boundary Lake, and Feldman Lake. The esker in the central portion of the study area and "Area 3" northeast of the Kidd Creek Mine are also identified to have archaeological potential as elevated topography and area with pockets of sandy soil, respectively. Additionally, Traditional Knowledge studies prepared for the Project indicate there are archaeologically significant natural resource areas (i.e., medicinal plants) in the study area (Appendix A: Figure 10).

Since the areas of general archaeological potential are in a wooded environment where ploughing is not possible or viable, per Section 2.1.5 Standard 1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), these should be visually inspected, including by examining the stream banks in the modelled areas from watercraft to refine the areas of archaeological potential that require Stage 2 test pit survey. The Stage 2 test pit survey should then be conducted hand shovel test pitting at distances between 0 m and 50 m from the modern primary water sources at 5-m grid intervals. All test pits should be a minimum of 30 centimetres (cm) in diameter and dug to a minimum of 5 cm into the subsoil. To recover artifacts, all soil or sediments should be screened through 6-millimetre (mm) mesh screens. Test pit profiles should be examined for cultural deposits prior to backfilling. Test pitting should be conducted to within 1 m of all disturbances and all test pits should be backfilled to level grade, with any sod caps replaced and tamped by foot.

However, per Section 2.1.9 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), test pit excavation may be difficult or impossible in undisturbed forest floors that exhibit shallow soil horizons. At the discretion of the licensed archaeologist, these areas may be investigated through a combination of methods including surface inspection of the forest floor in addition to test pit survey, surface investigation as an alternative to test pit survey, and clearing vegetation using a soft-toothed leaf rake over a 2-m diameter area and augmenting with close (“hands and knees”) visual inspections. If archaeological resources are found during these methods, a 10-m-square area centred on the positive cleared area should be cleared of vegetation; if positive cleared areas continue beyond the 10-m-square area, clearing vegetation from 2-m diameter areas should continue at 5-m intervals.

7.0 RECOMMENDATIONS

Based on the findings of the Stage 1 archaeological assessment of the study area, the following recommendations are made, subject to the conditions outlined below and in Section 8.0:

- 1) Approximately 416 ha (2.5%) of the study area is identified to have archaeological potential but is a wooded environment where ploughing is not possible or viable (Appendix A: Figure 10). If the Project will impact any areas identified to have archaeological potential, Stage 2 archaeological assessment should include, in addition to standard visual inspection, examining the stream banks in the modelled areas from watercraft to refine the areas of archaeological potential that require Stage 2 test pit survey. The Stage 2 test pit survey should then be conducted through hand digging shovel test pits at distances between 0 m and 50 m from the modern primary water sources at 5-m grid intervals, or at 10-m intervals on the features of archaeological potential (i.e., the esker and sandy area), per Section 2.1.5 Standard 1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011). Per Section 2.1.2 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), the test pit survey must be conducted to within 1 m of built structures or until the test pits reveal evidence of recent ground disturbance, and all test pits must be a minimum of 30-centimetres (cm) diameter and dug to a minimum of 5 cm into subsoil. All excavated soil or sediments must be screened through 6-millimetre (mm) mesh screens to recover artifacts. The excavated test pits should be examined for stratigraphy, cultural features, or evidence of fill, then backfilled to level grade unless directed otherwise by the proponent. If archaeological resources are found, the test pit survey must continue on the established grid to determine if there are other archaeological resources in sufficient quantities to recommend Stage 3 archaeological assessment; if there are insufficient archaeological resources to recommend Stage 3 archaeological assessment, it is required that intensified test-pit survey and test-unit excavations be conducted at the initial find location following Option A or B under Standard 2, Section 2.1.3 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011).

However, per Section 2.1.9 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), test pit excavation may be difficult or impossible in undisturbed forest floors that exhibit shallow soil horizons. At the discretion of the licensed archaeologist, the undisturbed forest floor may be investigated through a combination of methods including surface inspection and test-pit survey, surface investigation as an alternative to test-pit survey, and/or using a soft-toothed leaf rake to clear vegetation over 2-m diameter areas spaced at not more than 5-m intervals between the centres of the cleared areas. In cases where the live vegetation is dense, the surface raking can be augmented with close (“hands and knees”) visual inspections. If archaeological resources are found during these methods, a 10-m-square area centred on the positive area should be cleared of vegetation; if the positive cleared area continues beyond a 10-m square area, vegetation clearing from 2 m diameter areas should continue at 5 m intervals.

If sufficient archaeological resources are found to warrant Stage 3 archaeological assessment, any subsequent Stage 3 archaeological assessment should employ field methods appropriate to First Nation and Métis archaeological sites in northern Ontario.

- 2) As part of any future Stage 2 archaeological assessment(s) for the Project, First Nation and Métis communities with an interest in the Project should be invited to participate in the fieldwork and review the draft Stage 2 report(s). First Nation and Métis communities with an interest in the Project should also be consulted on the field methods employed for the Stage 2 and any subsequent archaeological assessment(s).

- 3) The recommendation by Archaeological Services Inc. (2024) to conduct Stage 1 property inspection to confirm low archaeological potential is still in effect for approximately 4 ha (0.02%) of the study area (Appendix A: Figure 10).
- 4) Approximately 461 ha (2.7%) of the study area was subjected to recent extensive and deep land alterations during forestry and mining operations (Kidd Creek Mine) and road, transmission line, and generating station construction and requires no further archaeological assessment (Appendix A: Figure 10).
- 5) Approximately 175 ha (1.0%) of the study area was previously assessed through Stage 1 and Stage 2 archaeological assessment and requires no further archaeological assessment (Appendix A: Figure 10).
- 6) Approximately 11,671 ha (69.3%) of the study area is permanently low and wet and requires no further archaeological assessment (Appendix A: Figure 10).
- 7) Approximately 4,117 ha (24.4%) of the study area is over 50 m from a modern water source, and not associated with a historic water source such as a glacial shoreline. These areas of low archaeological potential, though not evaluated through Stage 1 property inspection, are in remote locations where there are practical obstacles to achieving access. These obstacles include a lack of available transportation infrastructure (i.e., roads, trails), thick forest, and poorly drained terrain that presents challenges even for tracked vehicles to traverse. Per Section 1.3.4 Standard 1 of the *Standards and Guidelines for Consultant Archaeologists* (MCM 2011), these areas are exempt from Stage 2 archaeological survey (MCM 2011) (Appendix A: Figure 10).

The recommendations above are subject to review by the Ministry of Citizenship and Multiculturalism.

8.0 ADVICE ON COMPLIANCE WITH LEGISLATION

- 1) This report is submitted to the Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part IV of the *Ontario Heritage Act*, R.S.O. 1990, c O.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Citizenship and Multiculturalism, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.
- 2) It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such a time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the *Ontario Heritage Act*.
- 3) Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the *Ontario Heritage Act*.
- 4) The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 requires that any person discovering human remains must notify the local police or coroner and the Registrar, *Funeral, Burial and Cremation Services Act*, at the Ministry of Public and Business Service Delivery.

9.0 STUDY LIMITATIONS

WSP E&I Canada Limited (WSP) prepared this report solely for the use of the intended recipient, Canada Nickel Company, in accordance with the professional services agreement. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

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- 1) The work performed in the preparation of this report and the conclusions presented are subject to the following:
 - a) The Standard Terms and Conditions which form a part of our Professional Services Contract;
 - b) The Scope of Services;
 - c) Time and Budgetary limitations as described in our Contract; and,
 - d) The Limitations stated herein.
- 2) No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
- 3) The conclusions presented in this report were based, in part, on visual observations of the Study Area. Our conclusions cannot and are not extended to include those portions of the Study Area which were not reasonably available, in WSP's opinion, for direct observation.
- 4) The potential for archaeological resources, and any actual archaeological resources encountered, at the Study Area were assessed, within the limitations set out above, having due regard for applicable heritage regulations as of the date of the inspection.
- 5) Services including a background study and fieldwork were performed. WSP's work, including archival studies and fieldwork, were completed in a professional manner and in accordance with the Ministry of Citizenship and Multiculturalism guidelines. It is possible that unforeseen and undiscovered archaeological resources may be present at the Study Area.
- 6) The utilization of WSP's services during the implementation of any further archaeological work recommended will allow WSP to observe compliance with the conclusions and recommendations contained in the report. WSP's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.

- 7) This report is for the sole use of the parties to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or in part, or any reliance thereon, or decisions made based on any information or conclusions in the report, is the sole responsibility of such third party. WSP accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report, or anything set out therein.
- 8) This report is not to be given over to any third-party other than a governmental entity, for any purpose whatsoever without the written permission of WSP, which shall not be unreasonably withheld.

10.0 ASSESSOR QUALIFICATIONS

This report was prepared and reviewed by the undersigned, employees of WSP. The qualifications of the assessors involved in the preparation of this report are provided below.

Peter Popkin, Ph.D., CAHP, MCIfA, Principal Archaeologist (P362) – Dr. Peter Popkin is a Principal Archaeologist and Team Lead at WSP and he has over 20 years of professional experience in both consulting and academic archaeology within Canada and internationally. In Ontario he has successfully undertaken hundreds of consultant archaeology projects triggered by: the Environmental Assessment Act (individual and Class EAs, provincial and federal EAs), the Planning Act (subdivisions, site plans, re-zoning, official plan amendments, consent), the Environmental Protection Act (Renewable Energy Approvals O. Reg 359/09), as well as the Aggregates Resources Act (aggregate pit extensions), and has managed projects under the National Energy Board Act (now the Canadian Energy Regulator Act). Dr. Popkin holds the position of Contract Manager for WSP's Vendor of Record contract with Metrolinx for Emergent Archaeological Consulting Services (2019-2024) and holds the position of Principal Archaeologist for WSP's Professional and Consultant Services Roster 2022-2024, Category 18: Archaeology contract with the City of Hamilton. He has also completed numerous archaeological assessments on behalf of Infrastructure Ontario. Dr. Popkin holds a Professional Archaeology Licence (P362) from the Ontario Ministry of Citizenship and Multiculturalism, is a Professional Member of the Canadian Association of Heritage Professionals (CAHP) and is a full Member of the Chartered Institute for Archaeologists (MCIfA). Dr. Popkin received his Ph.D. from the Institute of Archaeology, University College London, London, UK (2009).

Henry Cary, Ph.D., CAHP, RPA, Lead Archaeologist (P327) – Dr. Henry Cary is a Lead Archaeologist at WSP with over 23 years of public- and private-sector experience directing archaeological and cultural heritage projects in urban, rural, Arctic and Sub-Arctic environments in Canada. He has produced over 100 Stage 1 through Stage 4 archaeological assessment reports, heritage evaluations, impact assessments, and conservation plans for a wide range of properties and sites across Ontario, including for projects undertaken by Hydro One Networks Inc., Ontario Power Generation, Ministry of Natural Resources, Metrolinx, and the Ministry of Transportation Ontario. Henry is skilled in analysis using GIS, digital survey and mapping, and other documentation of complex, multi-component archaeological sites, structures, and landscapes, and has developed and implemented standardized approaches to field recording, project and data management, and reporting for archaeological assessments compliant with the Standards and Guidelines for Consultant Archaeologists (2011). Dr. Cary studied Indigenous and historical-period archaeology and anthropology at Wilfrid Laurier University (B.A., with distinction), Memorial University (M.A.), and the Royal Military College of Canada (Ph.D.) and earned a Certificate in Project Management from the University of British Columbia and Certificate in Technical Writing from Dalhousie University. In addition to being an Adjunct Professor in the Anthropology Department at Saint Mary's University, he has taught courses at Mount Allison University over the past five years. Dr. Cary is a professionally licenced archaeologist in Ontario (P327) and a full member of the Canadian Association of Heritage Professionals (CAHP) and Register of Professional Archaeologists (RPA).

William Kearney, M.A., Staff Archaeologist (R1248) – Mr. William Kearney has been working as an archaeologist and researcher in the cultural-resource management industry since 2017. With experience conducting archaeological fieldwork in Ontario and British Columbia, he brings a dynamic skill set to development and remediation projects. In the field, Mr. Kearney has supervised archaeological site assessments, excavations, and mitigations with small to large teams (2-30 personnel) in a variety of environmental and cultural contexts. Outside of the field, he has experience analyzing lithic artifacts, conducting historical background research, preparing technical reports, and drafting project proposals. Mr. Kearney has developed valuable stakeholder management and communication skills through direct client communications, subcontractor organization, and First Nation engagement. Mr. Kearney is committed to fostering strong relationships with First Nation communities through honesty and good work. Mr. Kearney's education and work experience has equipped him with practical and theoretical knowledge of cultural resource management. Mr. Kearney has received a master's degree in history from McMaster University and a bachelor's degree in history from Wilfrid Laurier University. Mr. Kearney is a licensed archaeologist, currently holding an Applied Research License (R1248) issued by the Ontario Ministry of Citizenship and Multiculturalism.

11.0 CLOSURE

This report was prepared for the exclusive use of Canada Nickel Company and is intended to provide a Stage 1 archaeological assessment of the study area. The property is located in the Geographic Townships of Nesbitt, Beck, Mahaffy, Crawford, Lucas, Carnegie, Prosser in the District of Cochrane, and former Kidd and Wark Townships in the District of Cochrane, now City of Timmins, Ontario, Ontario.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. Should additional parties require reliance on this report, written authorization from WSP will be required. With respect to third parties, WSP has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The report is based on data and information collected during the Stage 1 background study conducted by WSP. It is based solely a review of historical information and data obtained by WSP as described in this report. Except as otherwise maybe specified, WSP disclaims any obligation to update this report for events taking place, or with respect to information that becomes available to WSP after the time during which WSP conducted the archaeological assessment. In evaluating the property, WSP has relied in good faith on information provided by other individuals noted in this report. WSP has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information provided by the current owner/occupant. WSP accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted.

WSP makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

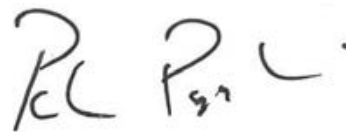
We trust that the information presented in this report meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact the undersigned.

Signature Page

WSP Canada Inc.



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Lead Archaeologist



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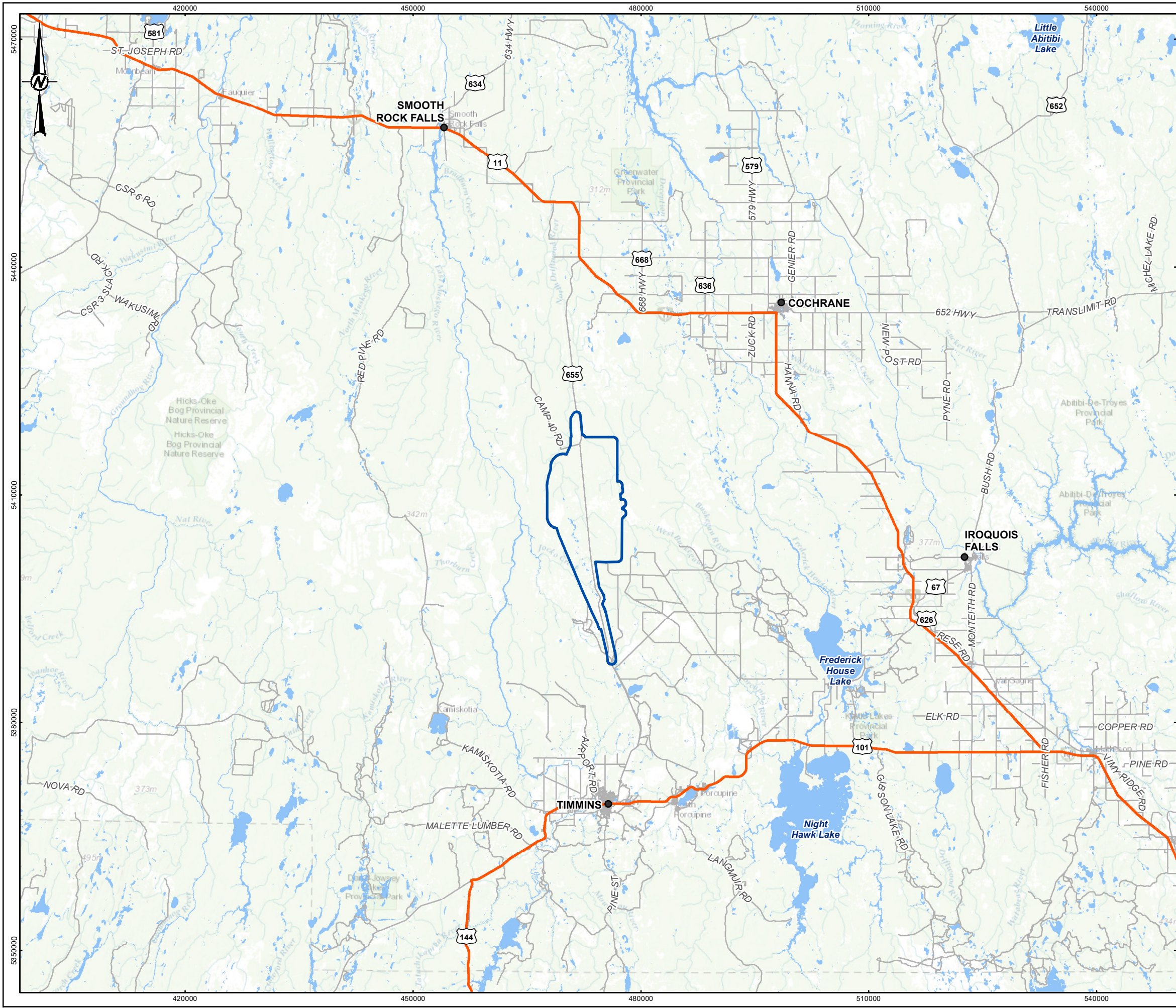
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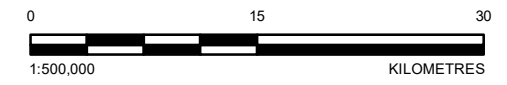
APPENDIX A

Figures



LEGEND

- HIGHWAY
- ROAD
- ARCHAEOLOGY STUDY AREA
- WATERBODY



REFERENCE(S)

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CLIENT

CANADA NICKEL COMPANY

PROJECT

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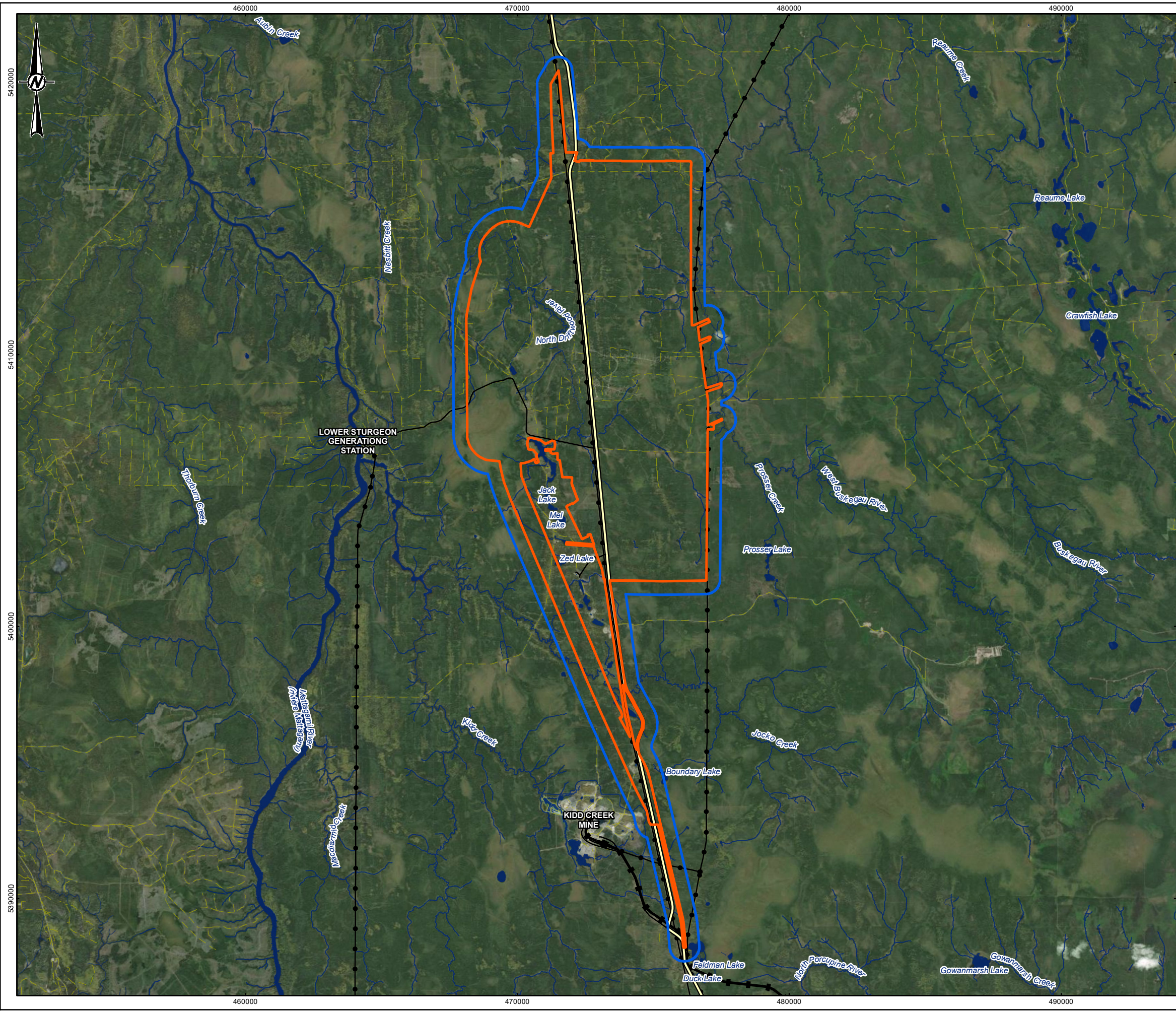
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	APPROVED	HC

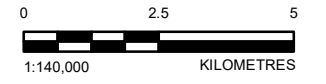
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LEGEND

- RAILWAY
- PRIMARY ROAD / HIGHWAY
- SECONDARY / LOCAL ROAD
- RESOURCE / RECREATION ROAD
- UTILITY LINE
- WATERCOURSE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY
- WATERBODY



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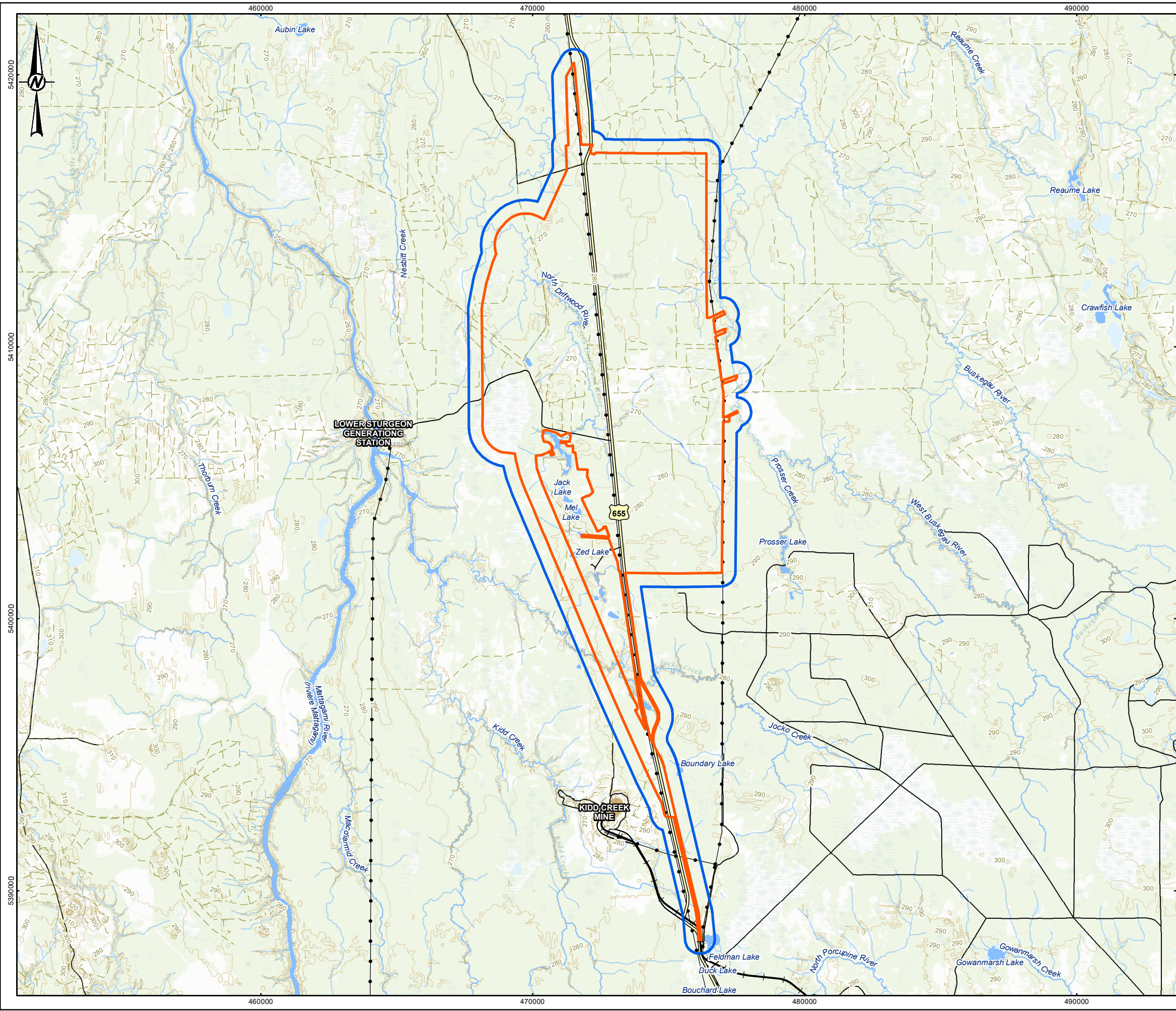
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DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

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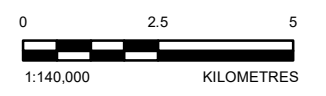
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- LEGEND**
- CONTOUR (5m)
 - RAILWAY
 - PRIMARY ROAD / HIGHWAY
 - SECONDARY / LOCAL ROAD
 - RESOURCE / RECREATION ROAD
 - UTILITY LINE
 - WATERCOURSE
 - ARCHAEOLOGY STUDY AREA
 - PROJECT BOUNDARY
 - WATERBODY



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DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

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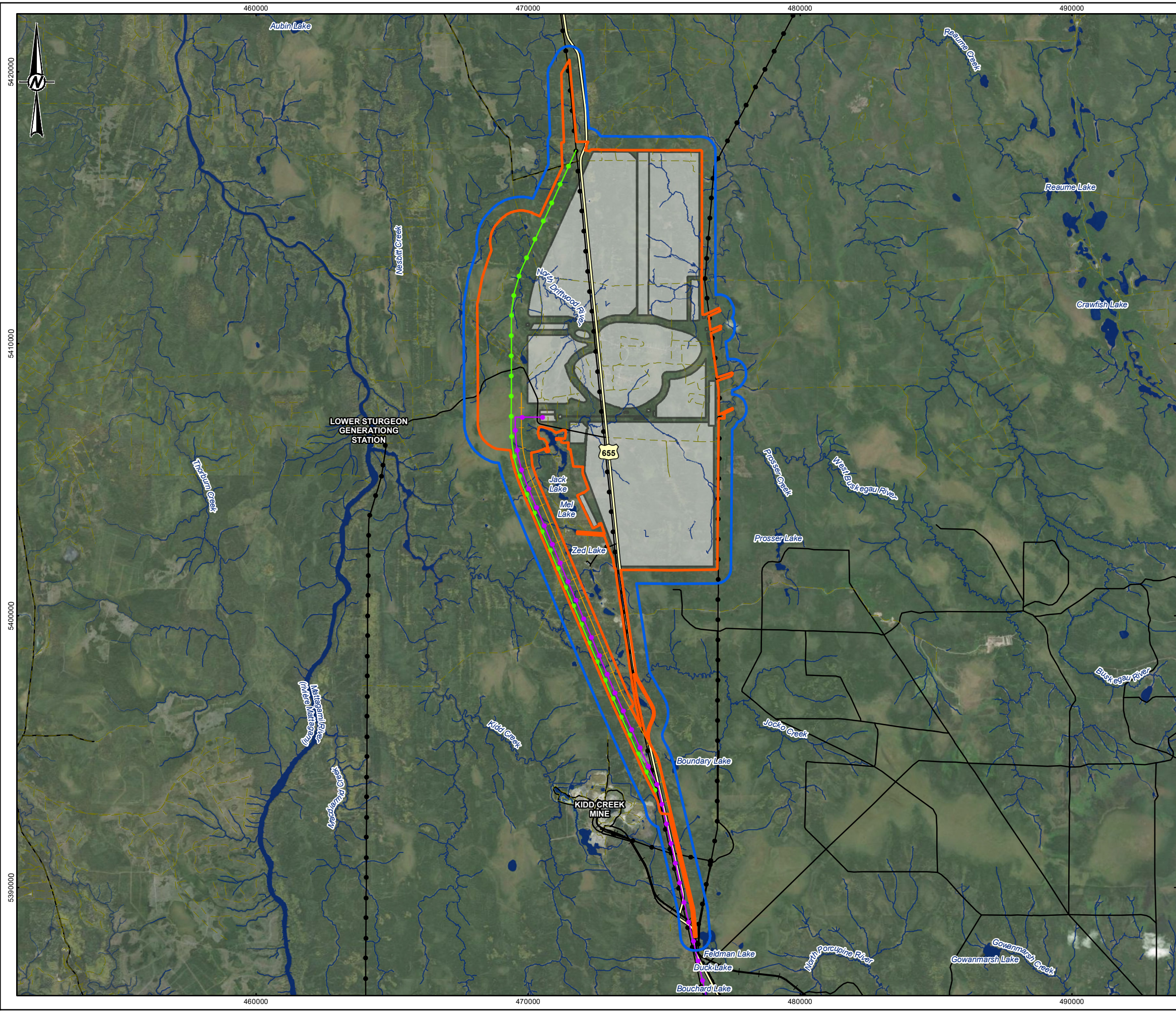
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PROJECT NO. 23599771 CONTROL 007 REV. 2 FIGURE 3

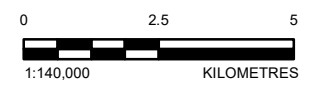
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LEGEND

- RAILWAY
- PRIMARY ROAD / HIGHWAY
- SECONDARY / LOCAL ROAD
- RESOURCE / RECREATION ROAD
- UTILITY LINE
- WATERCOURSE
- PROPOSED 500 kV TRANSMISSION LINE RELOCATION
- PROPOSED NEW 230 kV TRANSMISSION TO SITE
- PROPOSED NEW RAIL LINE TO SITE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY
- PROPOSED SITE LAYOUT (FEBRUARY 24, 2024)
- WATERBODY



NOTE(S)

1. PROPOSED SITE LAYOUT CORRECT AS OF 24 FEBRUARY 2024.
2. PROPOSED SITE FEATURES & LAYOUT MAY BE SUBJECT TO CHANGE.

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DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

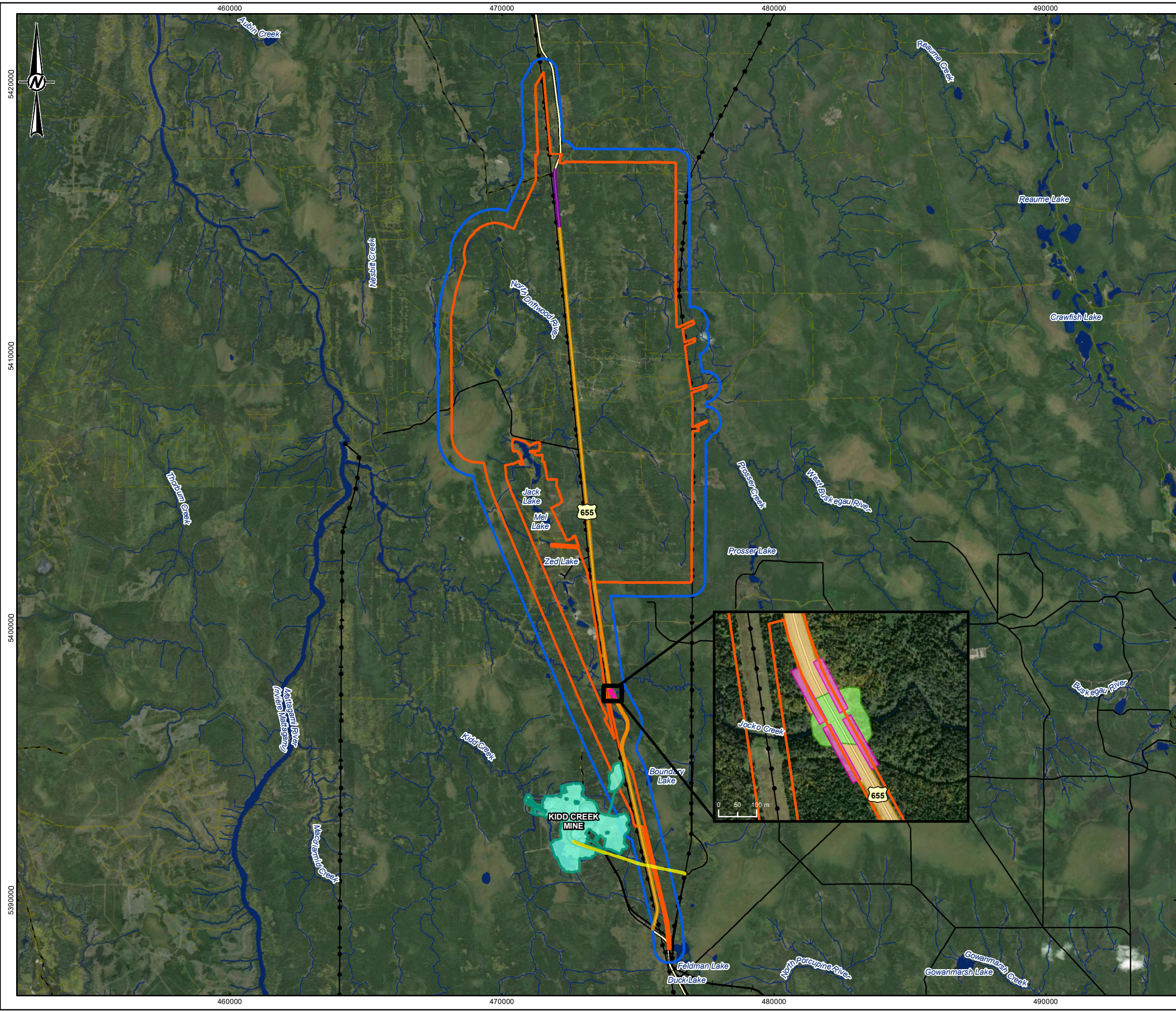
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PROJECT NO. 23599771 CONTROL 007 REV. 2 FIGURE 4

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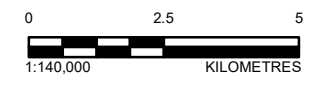


LEGEND

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- RESOURCE / RECREATION ROAD
- UTILITY LINE
- WATERCOURSE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY
- WATERBODY

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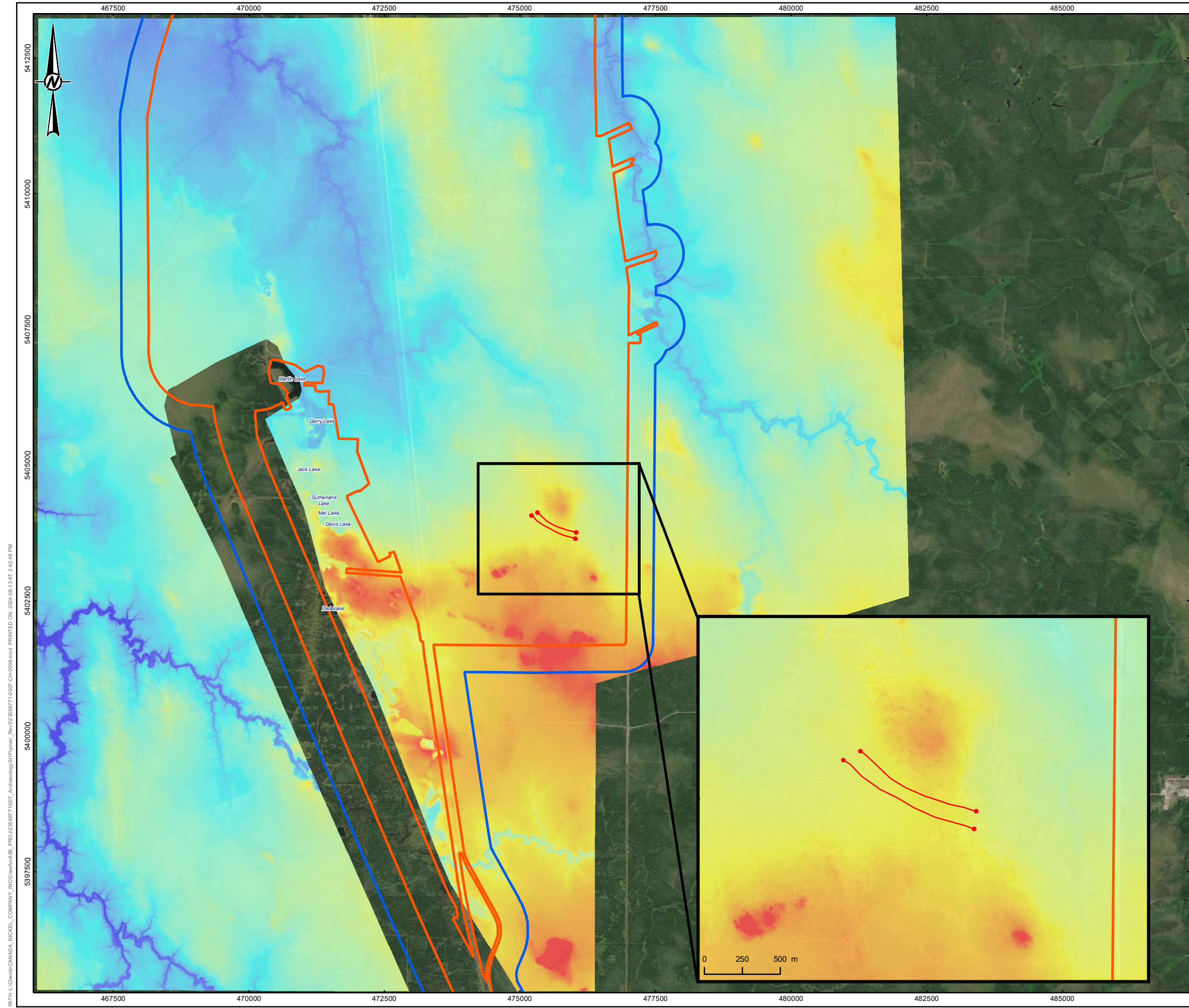
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DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

TITLE
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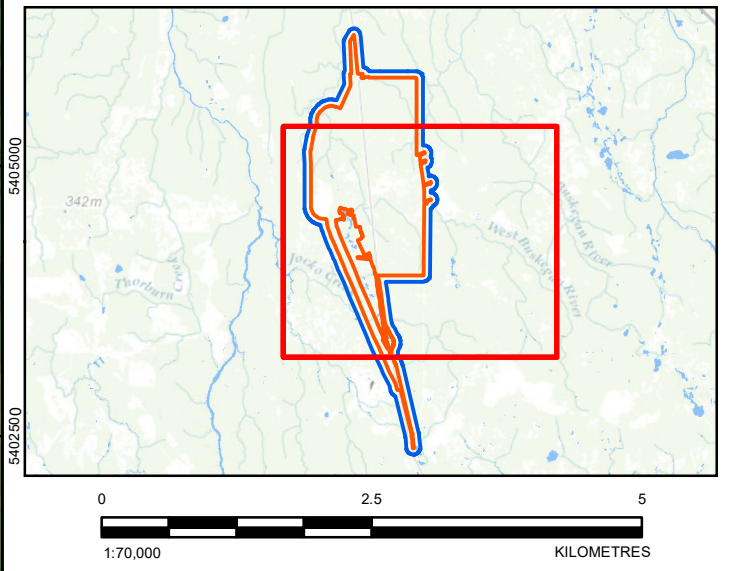
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LEGEND

- HISTORICAL BEACH RIDGE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY

ELEVATION (m)



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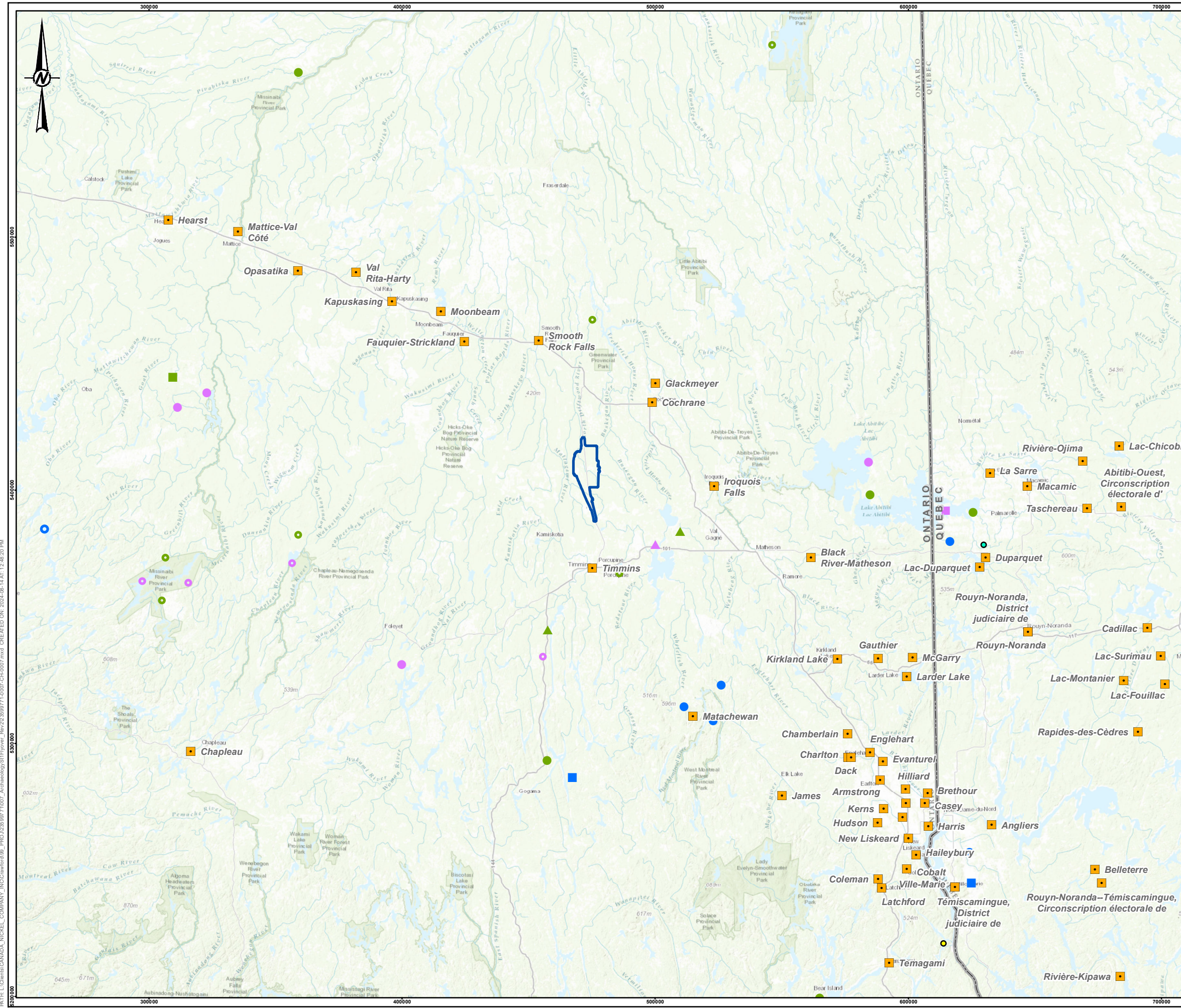
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RIDGE ON LIDAR (2023)**

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	PREPARED	VMB
	REVIEWED	HC
	APPROVED	HC

PROJECT NO. 23599771 CONTROL 007 REV. 2 FIGURE 6

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- LEGEND**
- NAMED LOCATION
 - ARCHAEOLOGY STUDY AREA
- POSTS OF THE CANADIAN FUR TRADE, 1600 TO 1870**
 1ST KNOWN OWNER OF POST*, KNOWN LENGTH OF OPERATION OF POST
- NORTH WEST COMPANY, 1 TO 3 YEARS
 - NORTH WEST COMPANY, 4 TO 15 YEARS
 - ▲ NORTH WEST COMPANY, 16 TO 50 YEARS
 - NORTH WEST COMPANY, OVER 50 YEARS
 - FRENCH, 4 TO 15 YEARS
 - CANADIAN INDEPENDENT, 1 TO 3 YEARS
 - CANADIAN INDEPENDENT, 4 TO 15 YEARS
 - CANADIAN INDEPENDENT, OVER 50 YEARS
 - HUDSON'S BAY COMPANY, 1 TO 3 YEARS
 - HUDSON'S BAY COMPANY, 4 TO 15 YEARS
 - ▲ HUDSON'S BAY COMPANY, 16 TO 50 YEARS
 - HUDSON'S BAY COMPANY, OVER 50 YEARS
 - BRITISH, OVER 50 YEARS

REFERENCE(S)

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PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83.
 COORDINATE SYSTEM: UTM ZONE 17 VERTICAL DATUM: CGVD28

CLIENT

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT CRAWFORD NICKEL PROJECT DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

TITLE

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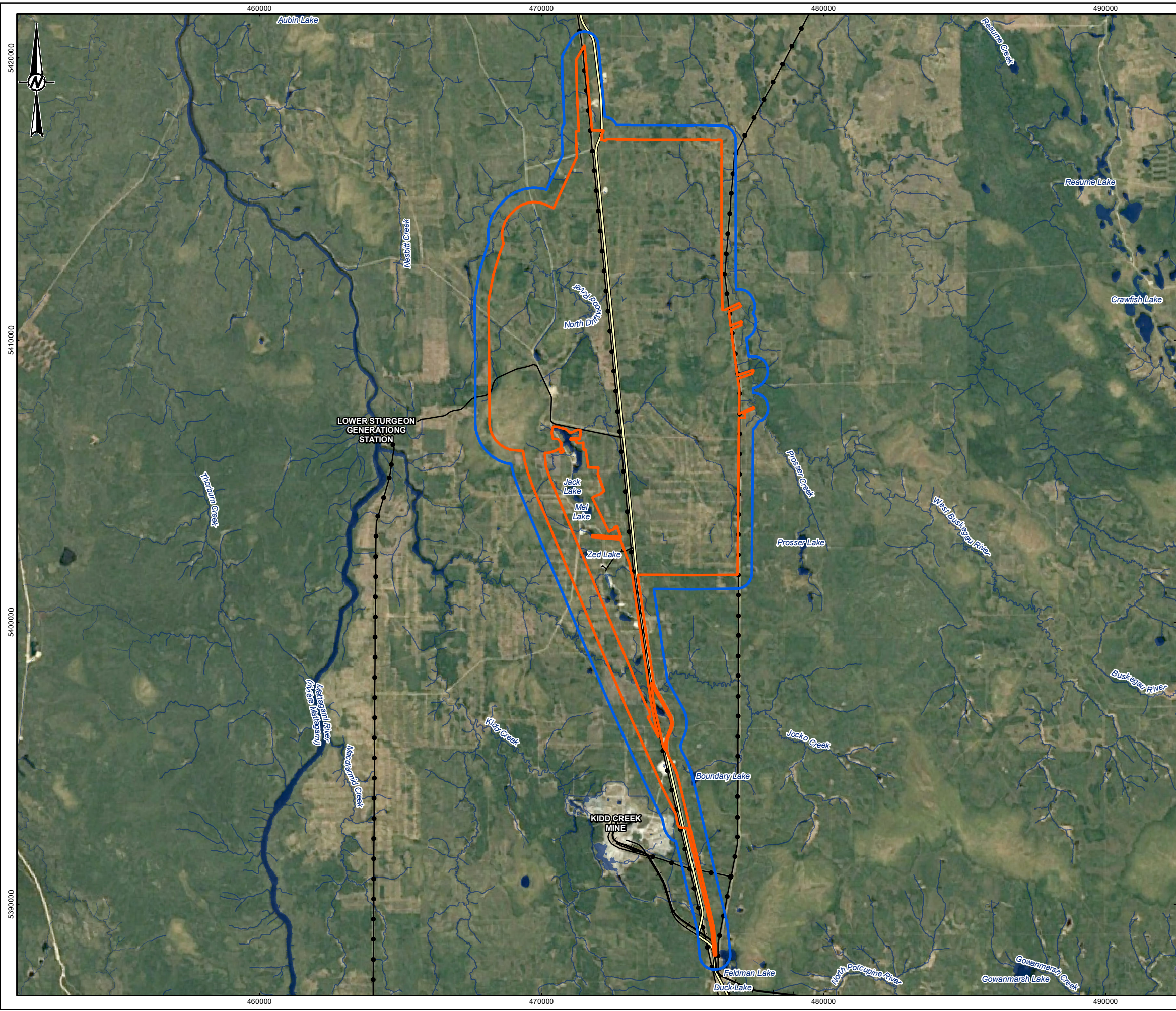
CONSULTANT

YYYY-MM-DD	2024-08-14
DESIGNED	HC
PREPARED	VMB
REVIEWED	HC
APPROVED	HC

PROJECT NO. CONTROL REV. FIGURE

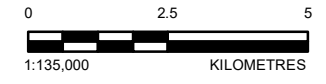
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LEGEND

- RAILWAY
- PRIMARY ROAD / HIGHWAY
- SECONDARY / LOCAL ROAD
- UTILITY LINE
- WATERCOURSE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY
- WATERBODY



REFERENCE(S)

1. BASE DATA - CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO.
[HTTPS://WWW.ONTARIO.CA/GOVERNMENT/OPEN-GOVERNMENT-LICENCE-ONTARIO](https://www.ontario.ca/government/open-government-licence-ontario)
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PROJECTION: TRANSVERSE MERCATOR
DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT CRAWFORD NICKEL PROJECT
DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

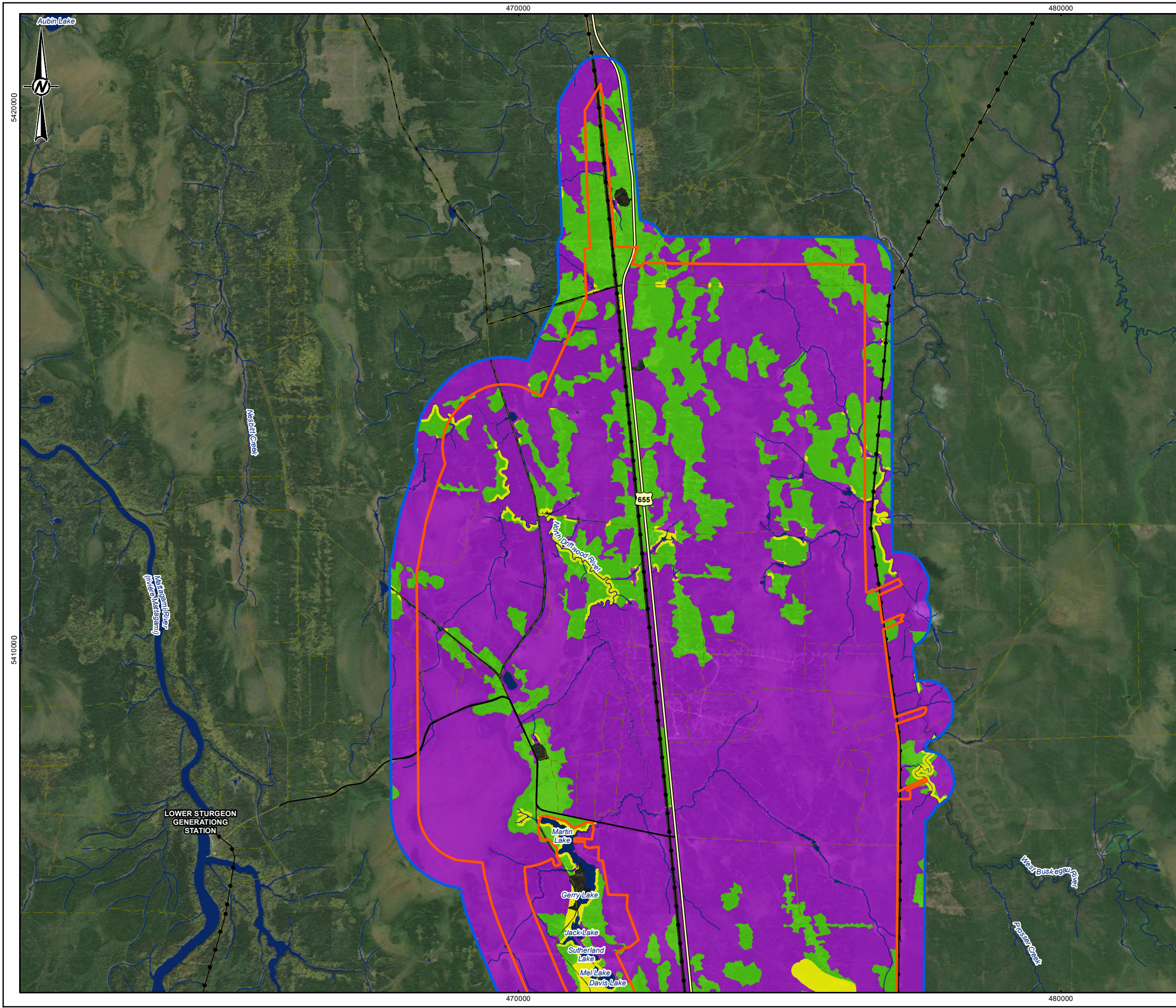
TITLE
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CONSULTANT	YYYY-MM-DD	2024-08-13
	DESIGNED	HC
	PREPARED	VMB
	REVIEWED	HC
	APPROVED	HC

PROJECT NO. 23599771	CONTROL 007	REV. 2	FIGURE 8
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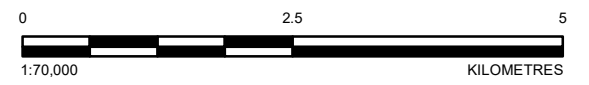
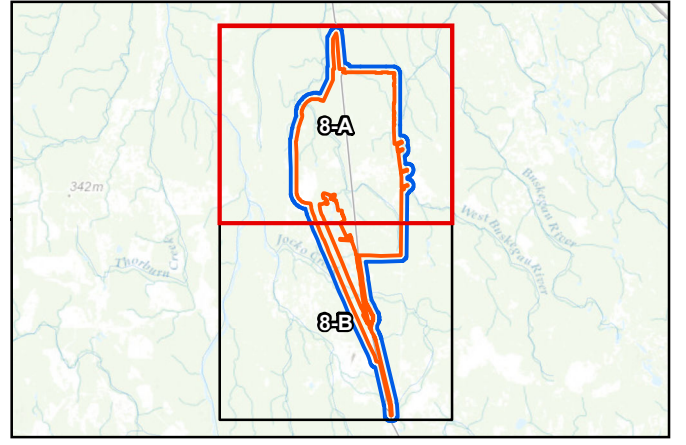


LEGEND

	PRIMARY ROAD / HIGHWAY		ARCHAEOLOGY STUDY AREA
	SECONDARY / LOCAL ROAD		PROJECT BOUNDARY
	RESOURCE / RECREATION ROAD		WATERBODY
	UTILITY LINE		
	WATERCOURSE		

ARCHAEOLOGICAL POTENTIAL MODEL

	DISTURBED (FORESTRY ACTIVITY AND ROADS): NO FURTHER ASSESSMENT REQUIRED
	MODELLED ARCHAEOLOGICAL POTENTIAL
	OVER 50 M FROM MODERN WATER SOURCES: NO FURTHER ASSESSMENT REQUIRED
	PREVIOUSLY ASSESSED: NO FURTHER ASSESSMENT REQUIRED
	PERMANENTLY LOW AND WET: NO FURTHER ASSESSMENT REQUIRED



REFERENCE(S)

1. BASE DATA - CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO. [HTTPS://WWW.ONTARIO.CA/GOVERNMENT/OPEN-GOVERNMENT-LICENCE-ONTARIO](https://www.ontario.ca/government/open-government-licence-ontario)
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CLIENT

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT CRAWFORD NICKEL PROJECT DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

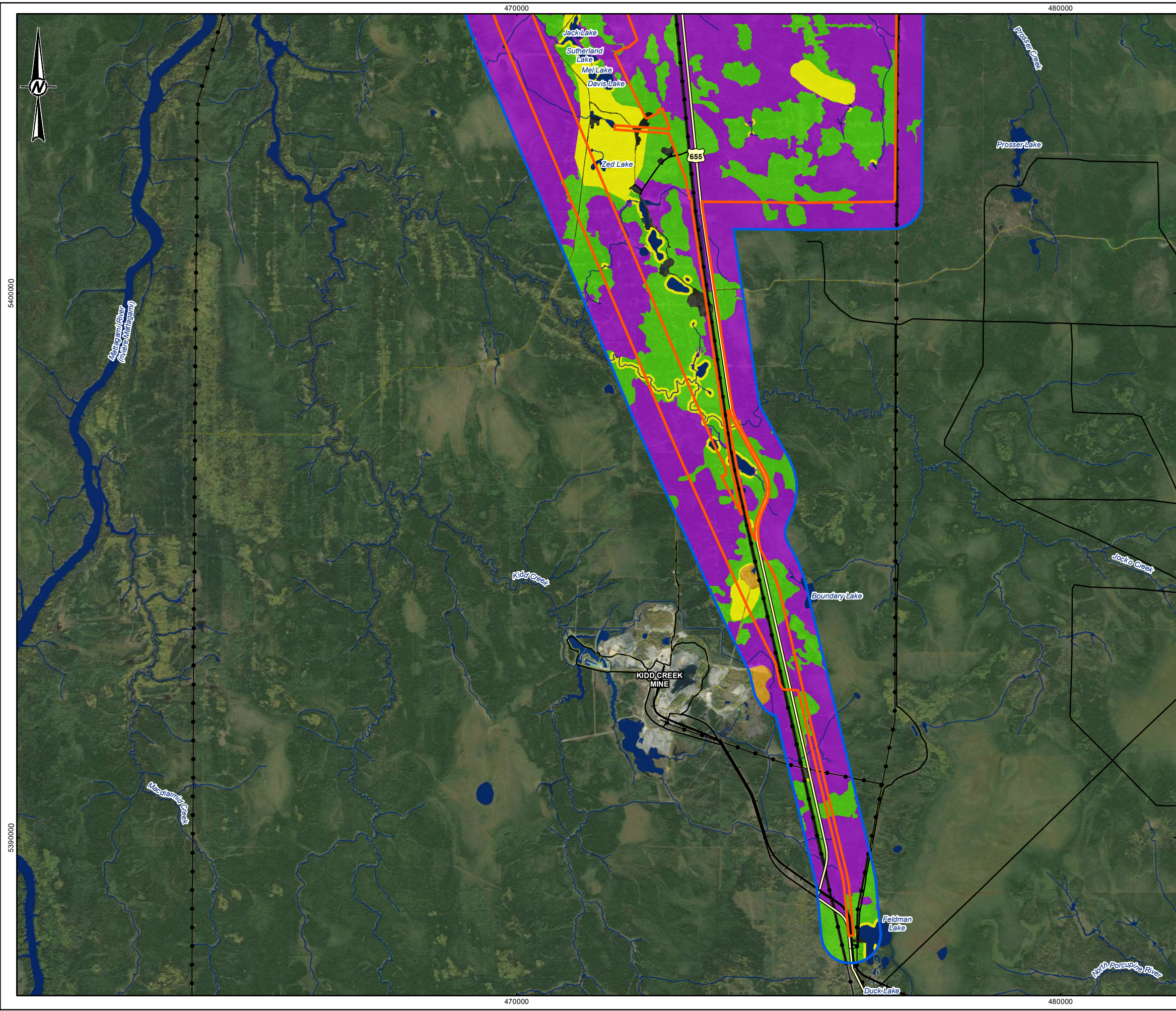
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CONSULTANT		YYYY-MM-DD	2024-08-14
		DESIGNED	HC
		PREPARED	VMB
		REVIEWED	HC
		APPROVED	HC

PROJECT NO.	CONTROL	REV.	FIGURE
23599771	007	2	9-A

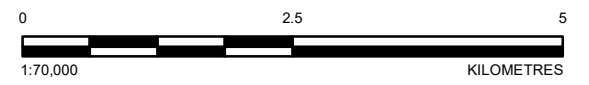
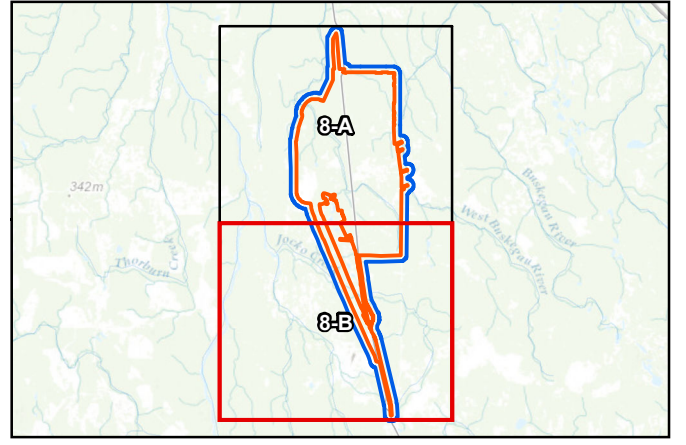
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- LEGEND**
- RAILWAY
 - PRIMARY ROAD / HIGHWAY
 - SECONDARY / LOCAL ROAD
 - RESOURCE / RECREATION ROAD
 - UTILITY LINE
 - WATERCOURSE
 - ARCHAEOLOGY STUDY AREA
 - PROJECT BOUNDARY
 - WATERBODY

- ARCHAEOLOGICAL POTENTIAL MODEL**
- DISTURBED (FORESTRY ACTIVITY AND ROADS): NO FURTHER ASSESSMENT REQUIRED
 - MODELLED ARCHAEOLOGICAL POTENTIAL
 - OVER 50 M FROM MODERN WATER SOURCES: NO FURTHER ASSESSMENT REQUIRED
 - PREVIOUSLY ASSESSED: STAGE 1 PROPERTY INSPECTION RECOMMENDED
 - PREVIOUSLY ASSESSED: NO FURTHER ASSESSMENT REQUIRED
 - PERMANENTLY LOW AND WET: NO FURTHER ASSESSMENT REQUIRED



REFERENCE(S)

1. BASE DATA - CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO. [HTTPS://WWW.ONTARIO.CA/GOVERNMENT/OPEN-GOVERNMENT-LICENCE-ONTARIO](https://www.ontario.ca/government/open-government-licence-ontario)
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CLIENT

PROJECT

STAGE 1 ARCHAEOLOGICAL ASSESSMENT CRAWFORD NICKEL PROJECT DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

TITLE

ARCHAEOLOGICAL POTENTIAL MODEL

CONSULTANT	YYYY-MM-DD	2024-08-14
	DESIGNED	HC
	PREPARED	VMB
	REVIEWED	HC
	APPROVED	HC

PROJECT NO.	CONTROL	REV.	FIGURE
23599771	007	2	9-B

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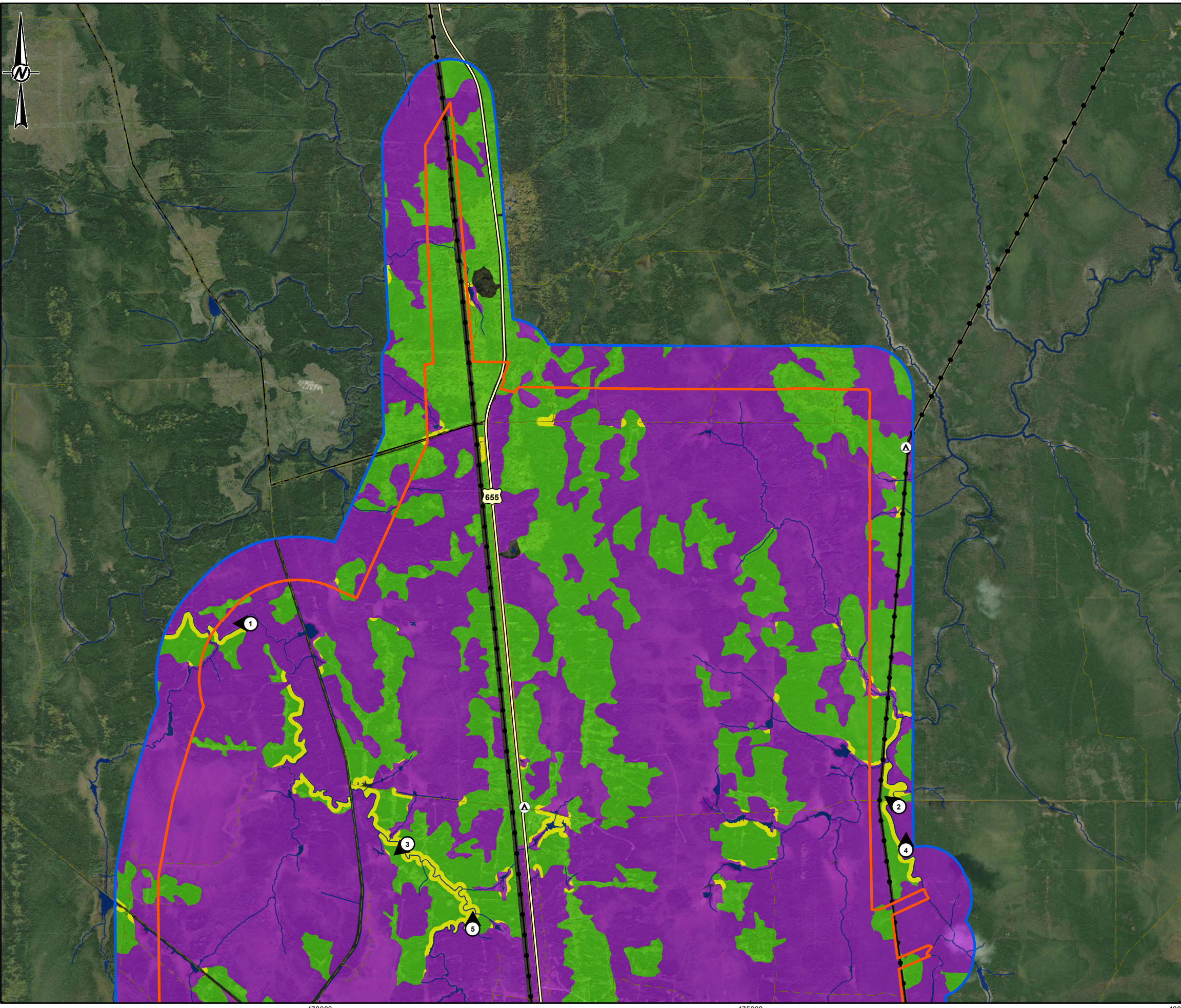
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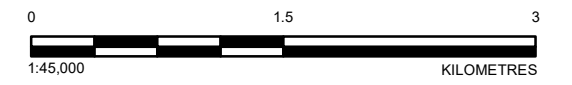
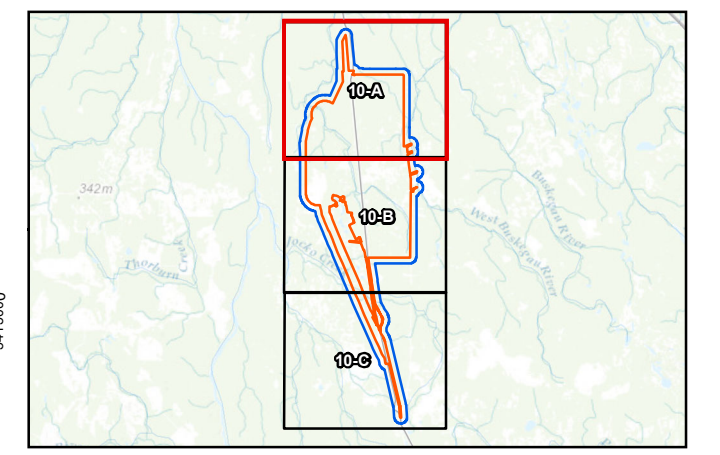


LEGEND

- PHOTO LOCATION AND DIRECTION
- CAMPS & HUNTING BLINDS
- PRIMARY ROAD / HIGHWAY
- RESOURCE / RECREATION ROAD
- UTILITY LINE
- WATERCOURSE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY
- WATERBODY

ARCHAEOLOGICAL POTENTIAL MODEL

- DISTURBED (FORESTRY ACTIVITY AND ROADS): NO FURTHER ASSESSMENT REQUIRED
- UNPLOUGHABLE LAND (WOODED): STAGE 2 TEST-PIT SURVEY REQUIRED
- OVER 50 M FROM MODERN WATER SOURCES: NO FURTHER ASSESSMENT REQUIRED
- PREVIOUSLY ASSESSED: STAGE 1 PROPERTY INSPECTION RECOMMENDED
- PREVIOUSLY ASSESSED: NO FURTHER ASSESSMENT REQUIRED
- PERMANENTLY LOW AND WET: NO FURTHER ASSESSMENT REQUIRED



REFERENCE(S)

1. BASE DATA - CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO.
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PROJECTION: TRANSVERSE MERCATOR
DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT CRAWFORD NICKEL PROJECT
DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

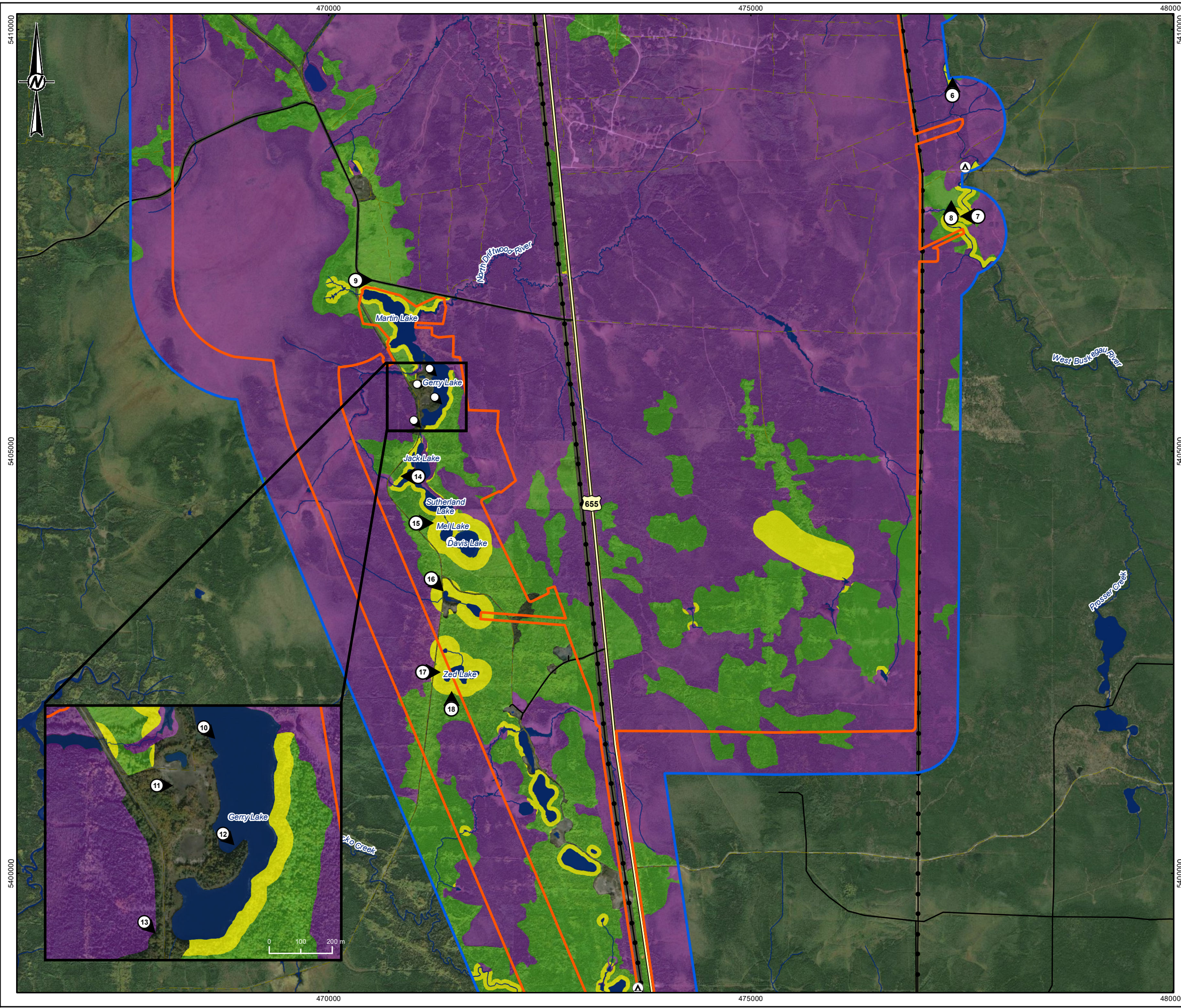
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CONSULTANT		YYYY-MM-DD	2024-08-13
DESIGNED		HC	
PREPARED		VMB	
REVIEWED		HC	
APPROVED		HC	

PROJECT NO. 23599771 CONTROL 007 REV. 2 FIGURE 10-A

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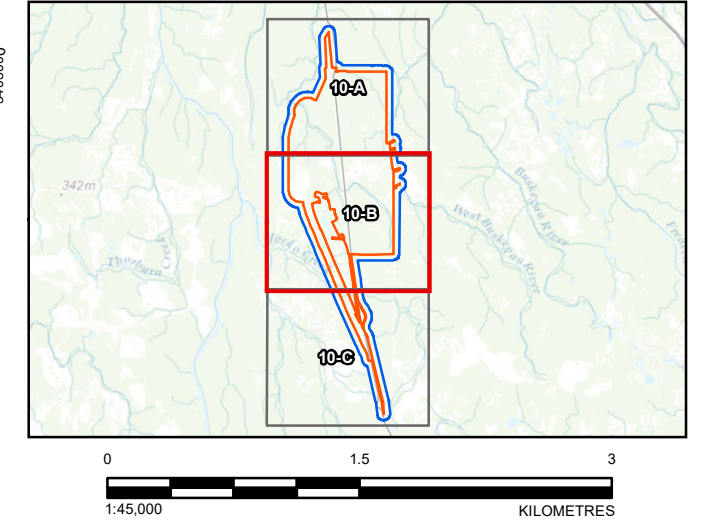


LEGEND

- PHOTO LOCATION AND DIRECTION
- CAMPS & HUNTING BLINDS
- PRIMARY ROAD / HIGHWAY
- SECONDARY / LOCAL ROAD
- RESOURCE / RECREATION ROAD
- UTILITY LINE
- WATERCOURSE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY
- WATERBODY

ARCHAEOLOGICAL POTENTIAL MODEL

- DISTURBED (FORESTRY ACTIVITY AND ROADS): NO FURTHER ASSESSMENT REQUIRED
- UNPLOUGHABLE LAND (WOODED): STAGE 2 TEST-PIT SURVEY REQUIRED
- OVER 50 M FROM MODERN WATER SOURCES: NO FURTHER ASSESSMENT REQUIRED
- PREVIOUSLY ASSESSED: STAGE 1 PROPERTY INSPECTION RECOMMENDED
- PREVIOUSLY ASSESSED: NO FURTHER ASSESSMENT REQUIRED
- PERMANENTLY LOW AND WET: NO FURTHER ASSESSMENT REQUIRED



REFERENCE(S)

1. BASE DATA - CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO. [HTTPS://WWW.ONTARIO.CA/GOVERNMENT/OPEN-GOVERNMENT-LICENCE-ONTARIO](https://www.ontario.ca/government/open-government-licence-ontario)
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CLIENT

PROJECT
STAGE 1 ARCHAEOLOGICAL ASSESSMENT CRAWFORD NICKEL PROJECT DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

TITLE
STAGE 1 ARCHAEOLOGICAL ASSESSMENT RESULTS WITH PHOTOGRAPH LOCATIONS AND DIRECTIONS

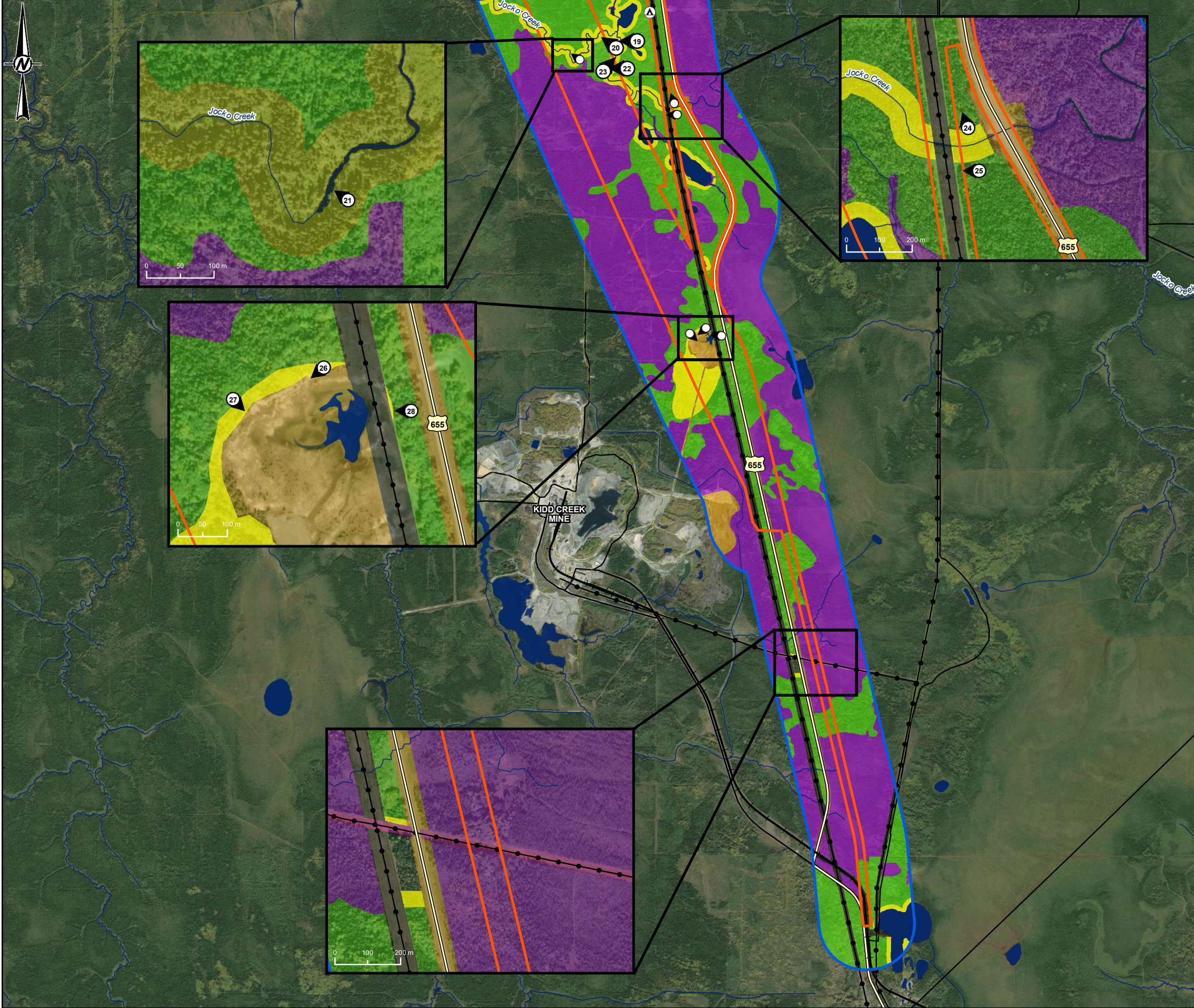
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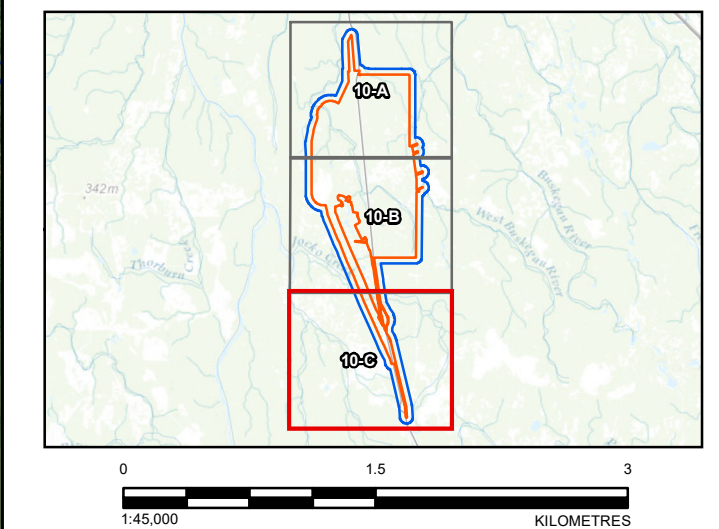


LEGEND

- PHOTO LOCATION AND DIRECTION
- CAMPS & HUNTING BLINDS
- RAILWAY
- PRIMARY ROAD / HIGHWAY
- SECONDARY / LOCAL ROAD
- UTILITY LINE
- RESOURCE / RECREATION ROAD
- WATERCOURSE
- ARCHAEOLOGY STUDY AREA
- PROJECT BOUNDARY
- WATERBODY

AREA OF ARCHAEOLOGICAL POTENTIAL

- DISTURBED (FORESTRY ACTIVITY AND ROADS): NO FURTHER ASSESSMENT REQUIRED
- UNPLOUGHABLE LAND (WOODED): STAGE 2 TEST-PIT SURVEY REQUIRED
- OVER 50 M FROM MODERN WATER SOURCES: NO FURTHER ASSESSMENT REQUIRED
- PREVIOUSLY ASSESSED: STAGE 1 PROPERTY INSPECTION RECOMMENDED
- PREVIOUSLY ASSESSED: NO FURTHER ASSESSMENT REQUIRED
- PERMANENTLY LOW AND WET: NO FURTHER ASSESSMENT REQUIRED



REFERENCE(S)
 1. BASE DATA - CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO.
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 DATUM: NAD 83 COORDINATE SYSTEM: UTM ZONE 17N

CLIENT

PROJECT
 STAGE 1 ARCHAEOLOGICAL ASSESSMENT CRAWFORD NICKEL PROJECT DISTRICT OF COCHRANE, AND CITY OF TIMMINS, ONTARIO

TITLE
STAGE 1 ARCHAEOLOGICAL ASSESSMENT RESULTS WITH PHOTOGRAPH LOCATIONS AND DIRECTIONS

CONSULTANT	YYYY-MM-DD	2024-08-14
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	REVIEWED	HC
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APPENDIX B

Photographs



PHOTOGRAPH 1: View facing west in the centre-west portion of the study area showing permanently wet lands within 50 m of a modern water source.



PHOTOGRAPH 2: View facing northwest in the centre-west portion of the study area along the West Buskegau River showing areas of archaeological potential.



PHOTOGRAPH 3: View facing southwest in the centre of the study area west of Highway 655 along the North Driftwood River showing permanently wet lands within 50 m of a modern water source.



PHOTOGRAPH 4: View facing north in the centre-east portion of the study area along the West Buskegeau River showing permanently wet lands within 50 m of a modern water source.



PHOTOGRAPH 5: View facing north in the centre portion of the study area along the North Driftwood River showing permanently wet lands within 50 m of a modern water source.



PHOTOGRAPH 6: View facing north of the centre-east portion of the study area along the West Buskegau River showing permanently wet lands within 50 m of a modern water source.



PHOTOGRAPH 7: View facing west in the centre-east portion of the study area along the West Buskegeau River showing permanently wet lands within 50 m of a modern water source.

The growth form and contrasting canopy of deciduous trees visible in this photograph indicate they are likely *Populus tremuloides*.



PHOTOGRAPH 8: View facing north of the centre-east portion of the study area along the West Buskegeau River showing permanently wet lands within 50 m of a modern water source.

The growth form and contrasting canopy of deciduous trees visible in this photograph indicate they are likely *Populus tremuloides*.



PHOTOGRAPH 9: View facing east of the centre portion of the study area showing areas of archaeological potential within 50 m of the northern shoreline of Martin Lake. Note the deforestation disturbance activities in the foreground.



PHOTOGRAPH 10: View facing southeast in the centre portion of the study area showing disturbance along the western shore of Gerry Lake.



PHOTOGRAPH 11: View facing east of the central portion of the study area showing the disturbed area on the west side of Gerry Lake (foreground) and areas of archaeological potential within 50 m of the eastern shoreline (centre).



PHOTOGRAPH 12: View facing southeast in the centre of the study area showing areas of archaeological potential within 50 m of the east shore of Gerry Lake (centre).



PHOTOGRAPH 13: View facing southeast in the centre-south portion of the study area showing areas of archaeological potential within 50 m of the eastern shore of Gerry Lake and disturbance from forestry activities along the western shore.



PHOTOGRAPH 14: View facing west in the centre-south portion of the study area showing areas of archaeological potential within 100 m of Sutherland Lake.



PHOTOGRAPH 15: View facing east in the centre-south portion of the study area showing areas of archaeological potential within 100 m of the shores of Mel Lake and David Lake.



PHOTOGRAPH 16:

View facing southeast in the centre-south portion of the study area. Within 100 m of the waterbody in the top centre of the photograph are areas of archaeological potential. The waterbody in the bottom centre of the photograph is an aggregate extraction area; no areas of archaeological potential were modelled within 100 m of this artificial waterbody.

The service road (bottom centre) runs along the west shore of the artificial waterbody.



PHOTOGRAPH 17: View facing east in the centre-south portion of the study area showing areas of archaeological potential within 100m of the shore of Zed Lake.



PHOTOGRAPH 18: View facing north in the centre-south portion of the study area showing areas of archaeological potential within 100m of the shore of Zed Lake.



PHOTOGRAPH 19: View facing west in the centre-south portion of the study area showing permanently wet lands within 50 m of Jocko Creek.



PHOTOGRAPH 20: View facing northwest in the centre-south portion of the study area showing permanently wet lands within 50 m of Jocko Creek.



PHOTOGRAPH 21: View facing northwest in the centre-south portion of the study area showing areas of archaeological potential within 50 m of the northern edge of Jocko Creek.



PHOTOGRAPH 22: View facing west in the centre-south portion of the study area showing permanently wet lands within 50 m of Jocko Creek.



PHOTOGRAPH 23: View facing northeast of the centre-south portion of the study area showing permanently wet lands within 50 m of Jocko Creek.



PHOTOGRAPH 24: View facing northwest in the centre-south portion of the study area showing areas of archaeological potential along Jocko Creek between the disturbed hydro-corridor and Highway 655.



PHOTOGRAPH 25: View facing west in the centre-south portion of the study area showing areas of permanently wet lands within 50 m of Jocko Creek west of the hydro-corridor.



PHOTOGRAPH 26: View facing southwest in the southern portion of the study area showing areas of archaeological potential on the northern shore of the former aggregate extraction site west of Highway 655.



PHOTOGRAPH 27: View facing southeast in the southern portion of the study area showing areas of archaeological potential along the southern shores of the former aggregate extraction site west of Highway 655.



PHOTOGRAPH 28: View facing west in the southern portion of the study area showing areas of archaeological potential on the northern shore of the former aggregate extraction site west of Highway 655. Note Kidd Creek Mine in the background.

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