



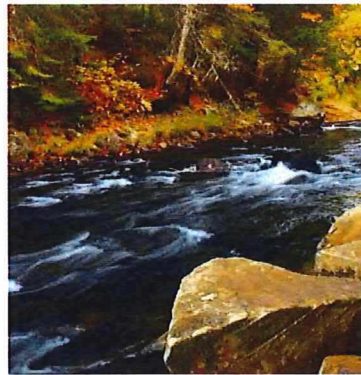
Natural Environment Level 2 Study

John Rintala Trucking Quarry
Fairbank Lake Rd, City of Greater Sudbury

Project # 191439

11 January 2021

Version 1.0





VERSION HISTORY

Version	Date	Modifications
Version 1.0	11-Jan-2021	Report Finalized

Contents

1.	Introduction	1
1.1	Project Description and Study Area	1
1.2	Natural Heritage	2
2.	Natural Environment Level 1 (NEL1) Results	5
3.	Impact Assessment, Avoidance and Mitigation	14
3.1	Habitat Loss and Preservation	14
3.2	Wetlands	15
3.2.1	A Priori Avoidances	16
3.2.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	16
3.2.3	Avoidance and Mitigation Commitments	17
3.2.4	Net Impacts (After Avoidance and Mitigations)	18
3.3	Eastern Whip-poor-will	19
3.3.1	A Priori Avoidances	20
3.3.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	20
3.3.3	Avoidance and Mitigation Commitments	20
3.3.4	Net Impacts (After Avoidance and Mitigations)	21
3.4	Bank Swallow	22
3.4.1	Preventing Bank Swallow Nesting	22
3.4.2	Reacting to Bank Swallow Nesting on Site	22
3.5	Blanding's Turtle and Turtle Habitat	22
3.5.1	A Priori Avoidances	23
3.5.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	24
3.5.3	Avoidance and Mitigation Commitments	24
3.5.4	Net Impacts After Avoidance and Mitigation	25
3.6	Endangered Bats and Bat Habitat	26
3.6.1	A Priori Avoidances	27

3.6.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	27
3.6.3	Avoidance and Mitigation Commitments	27
3.6.4	Net Impacts After Avoidance and Mitigation	28
3.7	Migratory Birds and Bird Habitat	29
3.7.1	A Priori Avoidances	29
3.7.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	29
3.7.3	Avoidance and Mitigation Commitments	30
3.7.4	Net Impacts After Avoidance and Mitigation	30
3.8	Amphibian Habitat	31
3.8.1	A Priori Avoidances	31
3.8.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	31
3.8.3	Avoidance and Mitigation Commitments	32
3.8.4	Net Impacts After Avoidance and Mitigation	32
3.9	Cervid Habitat	33
3.9.1	A Priori Avoidances	34
3.9.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	34
3.9.3	Avoidance and Mitigation Commitments	34
3.9.4	Net Impacts (After Avoidance and Mitigations)	35
3.10	Fish and Aquatic Habitat Adjacent the Site	36
3.10.1	A Priori Avoidances	36
3.10.2	Potential Impacts (in the Absence of Avoidance and Mitigation)	36
3.10.3	Avoidance and Mitigation Commitments	37
3.10.4	Net Impacts After Avoidance and Mitigation	38
3.11	General Best Practices	39
3.11.1	Species at Risk	39
3.11.2	Vegetation Removal	39

3.11.3	Daily Operation – Best Practices	39
3.11.4	Site Equipment	39
4.	Assumptions and Limitations	40
5.	Summary	41
6.	Conclusions and Closing	47

LIST OF TABLES

Table 1 – Summary of field studies and findings of the NEL1 report and Natural Heritage features carried forward to an NEL2 study.	6
Table 2 – Ecosite composition of the Extraction	14
Table 3 – Summary of field studies and findings of the NEL1 report and Natural Heritage features carried forward to an NEL2 study.	41

LIST OF FIGURES

Figure 1 – Location of the Site and Study Area.	4
Figure 2 – Site existing terrestrial habitat based on NEL1 studies and Ontario's Ecological Land Classification (ELC) system.	11
Figure 3 – Site existing aquatic habitat based on NEL1 studies.	12
Figure 4 – Natural Heritage features found to occur (or assumed to potentially occur) within the Study Area.	13
Figure 5 – Example of the cautionary signage that will be installed on the Site access driveway.	26



LIST OF APPENDICES

Appendix A – Site Plans

Appendix B – NEL2 Report Staff Credentials

Appendix C – SAR Reporting Form

1. INTRODUCTION

Tulloch Environmental, a division of Tulloch Engineering (Tulloch), was retained by Brad Rintala (the Proponent) to perform Natural Environment Levels 1 and 2 (NEL1 & NEL2) studies for inclusion in an application for Category 3 Class A Pit and Category 4 Class A Quarry licences under the Aggregate Resources Act (ARA). This application is in relation to privately owned lands on Lot 9, Concession 2 of the Township of Denison, City of Greater Sudbury, Ontario (henceforth the 'Property'; Figure 1).

1.1 Project Description and Study Area

The proposed Rintala quarry (the 'Project') is located on Lot 9, concession 2 of the Township of Denison, City of Greater Sudbury, Ontario; UTM (NAD83) 17T 469546 5137345 (Figure 1). This Property is located on Fairbank Lake Road, approximately 2 km west of the intersection of Fairbank Lake Road and Bay Street. The Property includes approximately 124 hectares of privately owned land. The north end of the Property is transected by road and rail right-of-ways for Fairbank Lake Road and a Genesee & Wyoming Canada Inc. rail line, respectively. Property access is facilitated by an existing unpaved driveway that extends south from Fairbank Lake Road, across the rail corridor and onto the main upland body of the Site.

Not all areas of the Property are feasible for development and large areas of the Property have been excluded from this ARA licence application. The southernmost portion of the Property is isolated by a large wetland complex that transects the Property and renders this area logistically inaccessible. This isolated section of the Property and the transecting southern wetland have been omitted from the proposed Licence Area.

An ecological approach was taken to establishing the proposed Licence and Extraction Areas for this Project. In early 2019, the Proponent engaged Tulloch to undertake a desktop environmental opportunities and constraints assessment for the Property. That assessment identified the potentially sensitive wetland complexes north, south and east of the Property, as well as the potential for intensive studies to evaluate the impacts of aggregate extraction if proposed in close proximity. Based on this information, the Proponent committed *a priori* to retain those large wetland complexes and to establish appropriate operational setbacks to safeguard their function. The Proponent further requested that the environmental professionals at Tulloch propose and delineate the Extraction Area for this Project in a manner that avoided known (and in some instances, candidate) Natural Heritage features. The Licence Area was then established in relation to the Extraction Area. This proactive approach has three advantages, (1) the potential for project impacts is greatly reduced by integrating Natural Heritage feature avoidance into the project design from inception, (2) the retention of, and setback from, key sensitive areas avoided the need for intensive studies associated with those areas, and (3) tailoring the Licence Area to the operations allowed NEL1 studies to better focus effort on those areas to be impacted.

The NEL 1 Study Area was defined as the Licence Area and areas within 120m. As the Licence Area was situated based on environmental considerations, habitat assessments were undertaken in areas beyond the Study Area. This additional habitat information is also included in this NEL1 report for reference purposes.

The Site plan prepared for this undertaking (Appendix A) includes a maximum 28.0ha Extraction Area (also referred to as the 'Site') to be extracted over the course of three phases (Figure 1). All development activities, including (but not limited to) land clearing, heavy equipment operation, aggregate extraction, stockpiling, processing of materials and hauling will be contained within the Extraction Area. The Site is serviced by an existing Site access driveway (~400m long) which connects to Fairbank Lake Road.

Work is projected to start in Fall 2021 and the lifespan is expected to be approximately 25 years (subject to market demands). As indicated in the Site plan, the first phase will focus on the southern half of the Extraction Area. The second and third phases will focus on the northern half of the Extraction Area.

1.2 Natural Heritage

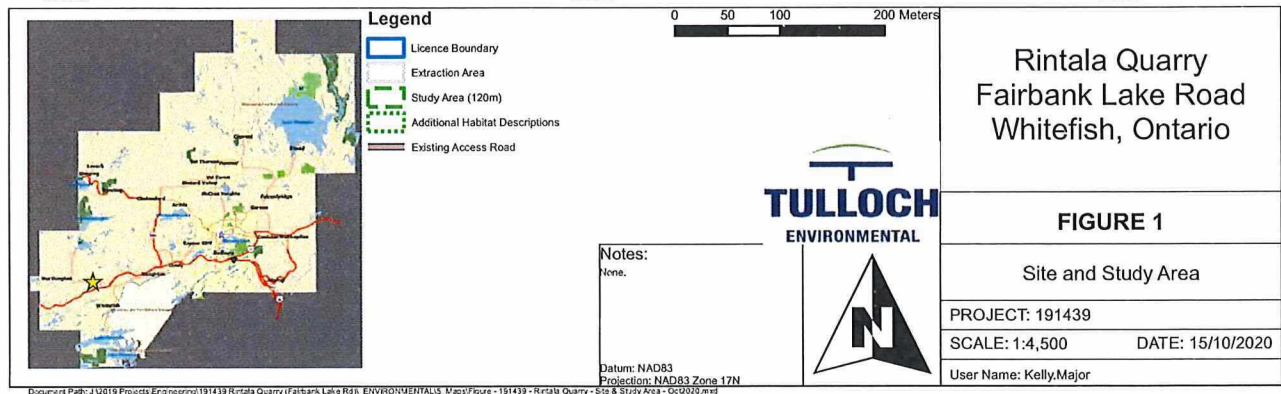
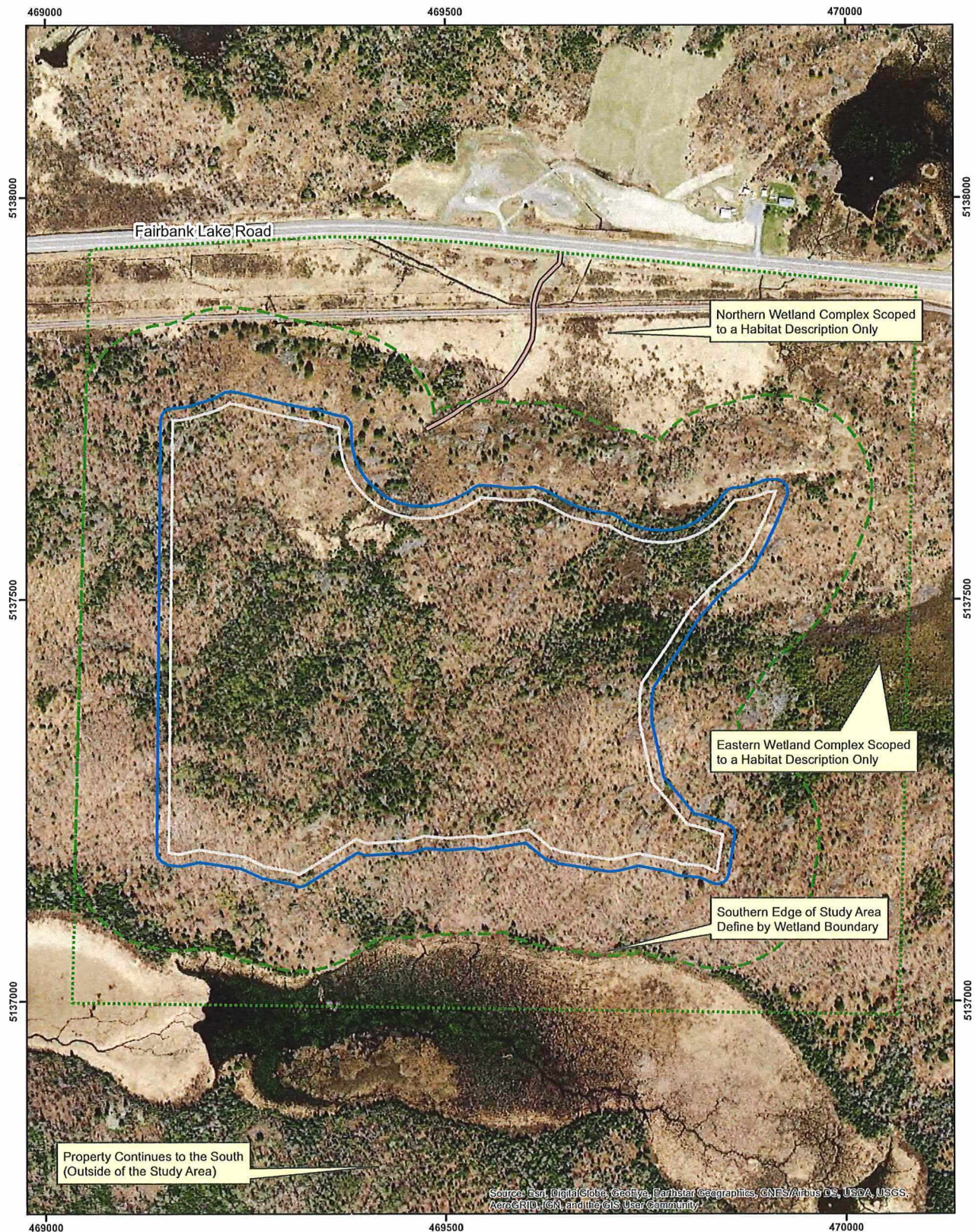
Section 2.1 of Ontario's Provincial Policy Statement (MMAH 2020), issued under the Planning Act, identifies, and establishes protections for Natural Heritage features in the province. In Central Ontario, Natural Heritage features include Species at Risk, Significant Wildlife Habitats, Provincially Significant Wetland, Coastal Wetland, Fish Habitat, and Areas of Natural and Scientific Interest. These features are themselves defined by provincial legislation (e.g. the *Endangered Species Act*), provincial policy documents (e.g. the *Ontario Wetland Evaluation System*, *Significant Wildlife Habitat Technical Guide*) or are directly established by the provincial government.

The federal government also identifies natural features of conservation concern and establishes protections that apply to provincial developments. Examples include migratory birds (via the *Migratory Birds Conservation Act*; S.C. 1994, c. 22) and fish habitat (via the *Fisheries Act*; R.S.C., 1985, c. F-14). These federal priorities, while not defined as Natural Heritage features, are typically assessed in conjunction with provincial Natural Heritage as their identification, evaluation and mitigation are closely related.

NEL1 studies were performed in 2019 and 2020 in partial fulfillment of permit application standards under the ARA (Tulloch 2020). Policy number A.R.4.01.06 of the Aggregate Resources Program Policies and Procedures Manual (MNR 2006) outlines the Natural Environment Report Standards for aggregate Site applications. This policy states that the NEL1 report shall determine whether one or more Natural Heritage features, as identified within the Provincial Policy Statement (PPS; OMMAH 2014) exists on-site or within 120 m of the proposed development. All

determinations made by Tulloch regarding known or suspected Natural Heritage features within 120m of proposed developments are documented in the NEL1 Report (Tulloch 2020).

This NEL2 study assess project impacts on Natural Heritage features identified in the NEL1 study and provides a series of Avoidance and Mitigation Commitments to eliminate or otherwise reduce foreseen impacts. Specifically, this report is structured such that each Natural Heritage feature known (or assumed) to be present on / around the Site has four sections, (1) a feature summary based on the NEL1 studies, (2) a list of potential project impacts should no avoidances or mitigations be adopted, (3) a series of industry standard avoidances and mitigations to address impacts, and (4) an assessment of residual impacts (if any) once avoidances and mitigations are applied.



2. NATURAL ENVIRONMENT LEVEL 1 (NEL1) RESULTS

NEL1 studies were conducted by Tulloch in 2019 and 2020. A Natural Heritage background review was performed to identify environmental sensitivities with records of occurrence on, or in vicinity, of the Study Area. On-site assessments / surveys were also performed to establish the existing conditions across the Study Area and to investigate the significance of candidate Natural Heritage features within the Study Area. The key results relevant to this NEL2 are summarized in Table 1. Full details of the methods and results are provided in the NEL1 study report (Tulloch 2020).

Habitat throughout the Study Area was classified and described according to the Ontario Ecological Land Classification (ELC) system. Maps of the existing terrestrial and aquatic habitat in the Study Area are provided in Figures 2 and 3, respectively. Natural Heritage features found to occur (or assumed to potentially occur) within the Study Area are depicted in Figure 4.

Table 1 – Summary of field studies and findings of the NEL1 report and Natural Heritage features carried forward to an NEL2 study.

Feature	NEL1 Assessments ¹	NEL1 Results	Carried Forward to NEL2 Studies?
Significant Wetlands ²	<p>Wetlands within the Study Area were assessed for various ecological functions including SWH, SAR habitat and fish habitat. Effort was focused on wetlands immediately south of Fairbanks Lake Road (north side of the Study Area) and small (<2ha) wetlands within the main body of the Study Area as these areas are subject to potential impacts by the Project.</p> <p>Although some ecological functions are discussed for the large wetlands south and east of the Study Area, these areas were not extensively studied as an operational setback of 120m is an <i>a priori</i> assumption (i.e. Project impacts can be avoided).</p>	<ul style="list-style-type: none"> Large wetland complexes north, south and east of the Study Area would require OWES evaluations to determine provincial significance. In the absence of these OWES studies, these wetlands should be retained and work in vicinity should demonstrate no negative impacts. Small wetlands (<2ha) within the Study Area (G135S and G223S) are not eligible for OWES evaluation and therefore do not qualify for provincial significance. 	<p>Yes.</p> <p>May be Present (to be Avoided): Large wetland complexes to be retained and safeguarded.</p> <p>Confirmed Absent: Small (<2ha) wetlands are not eligible for OWES evaluation.</p>
Species at Risk (SAR) ³ : Threatened and Endangered	<p>Eastern Whip-poor-will (<i>Caprimulgus vociferus</i>)</p> <ul style="list-style-type: none"> Nocturnal Birds Acoustic Surveys (MNRFP Whip-poor-will Protocol) <p>Blanding's Turtle (<i>Emydoidea blandingii</i>)</p> <ul style="list-style-type: none"> General Habitat Assessment <p>Endangered Bats</p> <ul style="list-style-type: none"> General Habitat Assessment 	<p>Eastern Whip-poor-will</p> <ul style="list-style-type: none"> Whip-poor-will are confirmed present in the Study Area. Three (3) defended territories were observed to be intersecting the Study Area; Figure 4. <p>Blanding's Turtle</p>	<p>Yes.</p> <p>Confirmed Present: Whip-poor-will</p> <p>May be Present (to be Avoided): Blanding's Turtle</p>

Feature	NEL1 Assessments ¹	NEL1 Results	Carried Forward to NEL2 Studies?
		<ul style="list-style-type: none"> Blanding's Turtle wintering habitat could exist in wetlands north and south of the Study Area (Figure 4). Species presence not confirmed as these wetlands are to be retained. <p>Endangered Bats</p> <ul style="list-style-type: none"> The Study Area does not appear to present ideal habitat for bat maternity roosting. Foraging and day-roosting by these species are possible; especially in proximity to wetlands. No suitable hibernation habitat. 	Endangered Bats
Significant Wildlife Habitat (SWH) ⁴	<p>Turtle Habitat</p> <ul style="list-style-type: none"> Overwintering Habitat Assessment Nesting Habitat Assessment <p>Bat Habitat</p> <ul style="list-style-type: none"> Bat Habitat Assessment <p>Bird Habitat</p> <ul style="list-style-type: none"> SM4 Songmeters (Dawn Recordings) SM4 Songmeters (Evening Recordings) Nocturnal Birds Acoustic Surveys (MNRW Whip-poor-will Protocol) Study Area Reconnaissance (on Foot) Study Area Reconnaissance (UAV Drone) 	<p>Turtle Habitat</p> <ul style="list-style-type: none"> Turtle wintering habitat could exist in wetlands north and south of the Study Area. Species presence not confirmed as these wetlands are to be retained. <p>Bat Habitat</p> <ul style="list-style-type: none"> The Study Area does not appear to present ideal habitat for bat maternity roosting. No suitable hibernation habitat. <p>Bird Habitat</p>	<p>Yes</p> <p>Confirmed Present: Cervid Movement Corridor</p> <p>May be Present (to be Avoided): Turtle Habitat Waterfowl Nesting Habitat Amphibian Breeding (Wetlands)</p>

Feature	NEL1 Assessments ¹	NEL1 Results	Carried Forward to NEL2 Studies?
	<ul style="list-style-type: none"> Incidental Observations <p>Amphibian Habitat</p> <ul style="list-style-type: none"> SM4 Songmeters (Evening Recordings) Egg Mass / Larva Searches Incidental Observations SM4 Songmeters (Evening Recordings) <p>Cervid Habitat</p> <ul style="list-style-type: none"> GeoHub Data Review General Study Area Reconnaissance Incidental Observations <p>No: Snake Hibernacula; Candidate habitat can be avoided.</p>	<ul style="list-style-type: none"> No evidence of breeding by Special Concern birds. Waterfowl nesting is possible in proximity to the large southern wetland complex. The significance of all other candidate bird SWH in the Study Area was discounted. <p>Amphibian Habitat</p> <ul style="list-style-type: none"> No significant amphibian breeding in small wetlands G134S and G223S. Amphibian breeding could be significant in large wetland systems North, South and East of the Study Area. Species presence not confirmed as these wetlands are to be retained. <p>Cervid Habitat</p> <ul style="list-style-type: none"> Elk (<i>Cervus canadensis</i>) movement corridor along the north side of the Site (Figure 4). Possible Moose (<i>Alces alces</i>) movement corridor adjacent southern wetlands (to access aquatic feeding habitat). Species 	

Feature	NEL1 Assessments ¹	NEL1 Results	Carried Forward to NEL2 Studies?
		presence not confirmed as these wetlands are to be retained.	
Fish and Aquatic Habitat ⁵	<p>Yes.</p> <ul style="list-style-type: none"> Fish Community Survey 	<ul style="list-style-type: none"> Fish habitat confirmed in drains adjacent Fairbank Lake Road and the Rail Right-of-way (Figure 4). Fish habitat could exist in wetlands south of the Study Area. Species presence not confirmed as these wetlands are to be retained. 	<p>Yes.</p> <p>Confirmed Present.</p> <p>Although operations will set back at least 120m from waterbodies and wetlands, best practices for the protection of aquatic habitat in vicinity to the Study Area will be carried forward for consideration in the NEL2. Furthermore, Study Area access occurs in vicinity to confirmed fish habitat.</p>
Migratory Birds ⁶	<p>Yes.</p> <ul style="list-style-type: none"> SM4 Songmeters (Dawn Recordings) SM4 Songmeters (Evening Recordings) 	<ul style="list-style-type: none"> Vegetated habitat throughout the Study Area supports suitable nesting by various migratory bird species. Many migratory bird 	<p>Yes.</p> <p>Confirmed Present:</p>

Feature	NEL1 Assessments ¹	NEL1 Results	Carried Forward to NEL2 Studies?
	<ul style="list-style-type: none"> Nocturnal Birds Acoustic Surveys (MNRF Whip-poor-will Protocol) Study Area Reconnaissance (on Foot) Study Area Reconnaissance (UAV Drone) Incidental Observations 	species were observed within the Study Area.	Migratory Bird Breeding Habitat

¹Searches and surveys carried forward to field studies were selected based on the results of Site reconnaissance and habitat assessments described in the NEL1 report. Targeted studies were only conducted in instances where Site reconnaissance suggested habitat / conditions might be suitable for the species / feature to occur and where the candidate features could not be avoided by the Project.

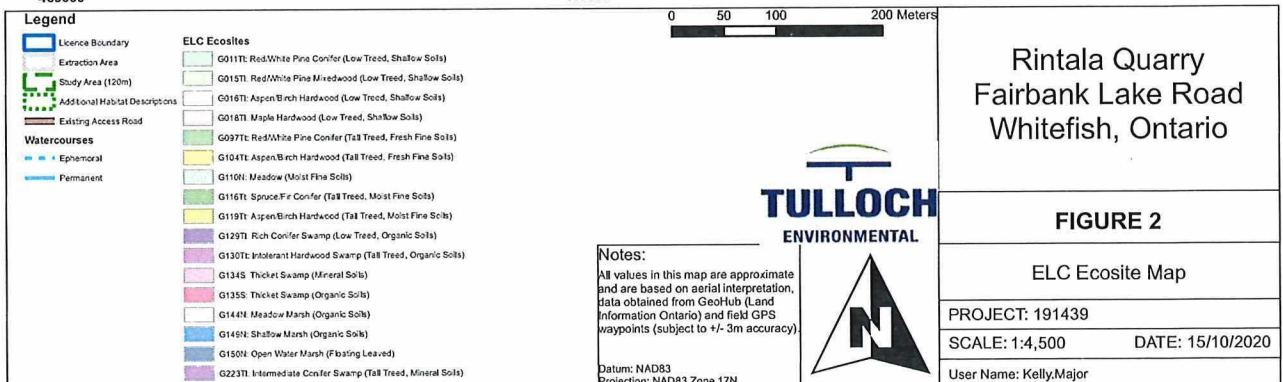
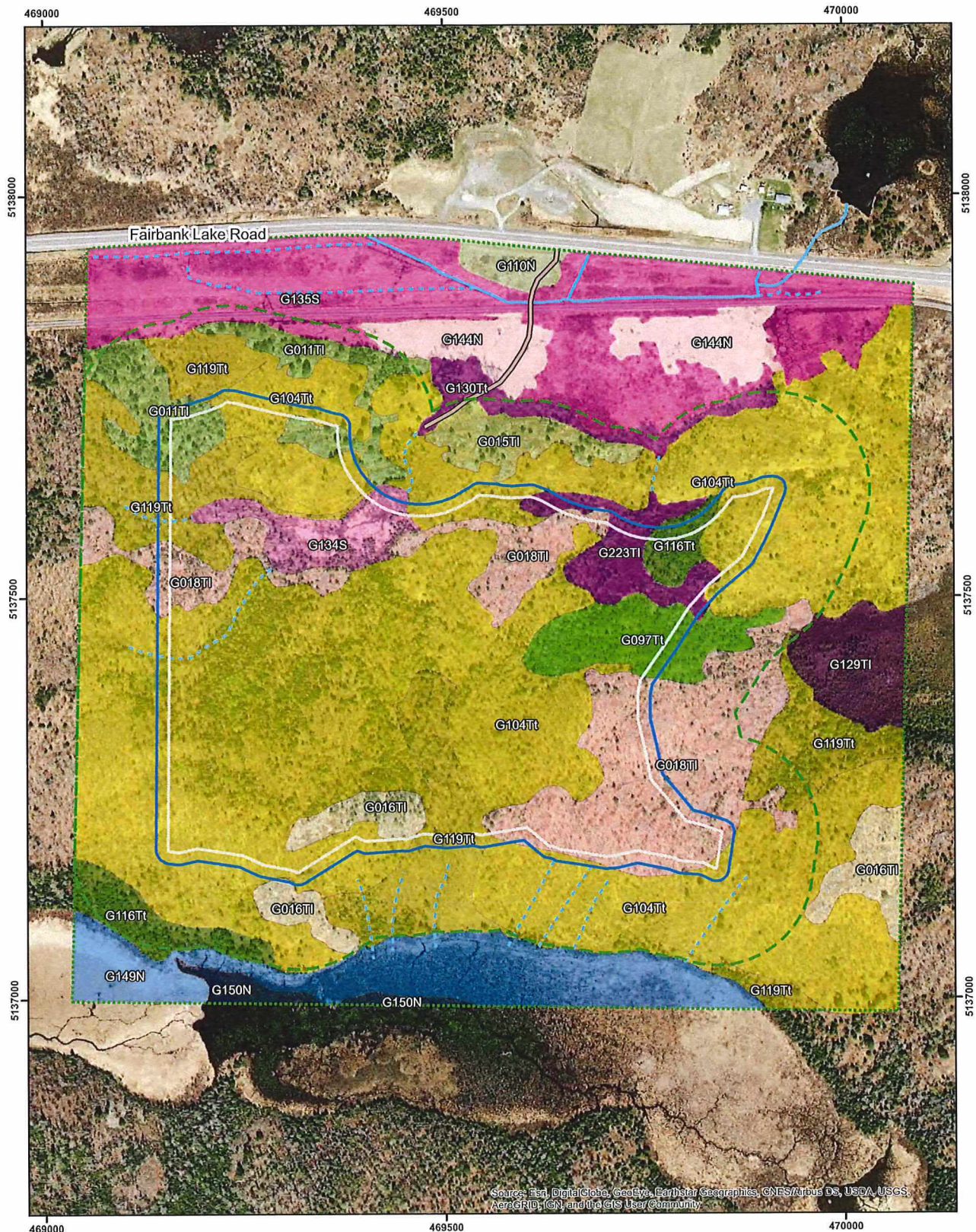
²As defined by the Ontario Wetland Evaluation System Northern Manual (MNRF 2014)

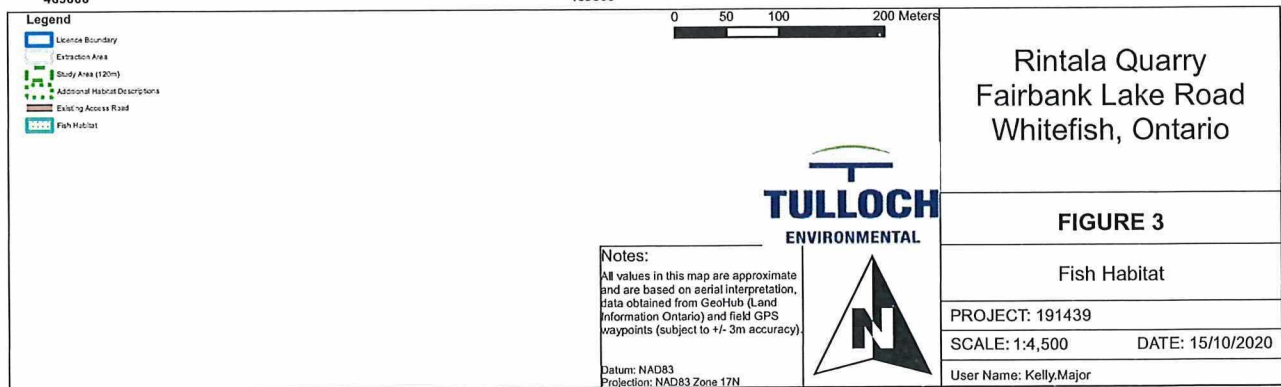
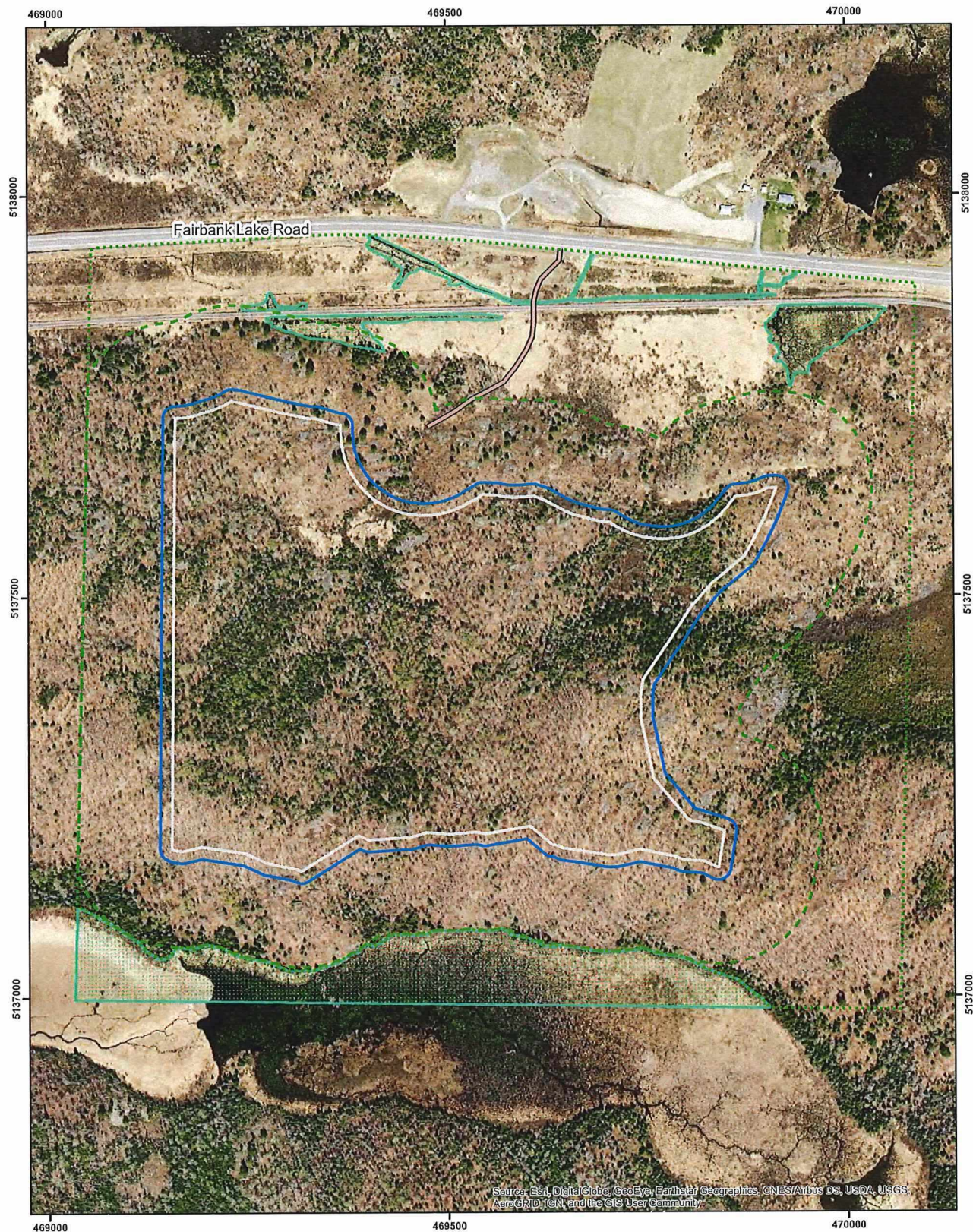
³As defined by the Endangered Species Act (ESA; S.O. 2007, c. 6)

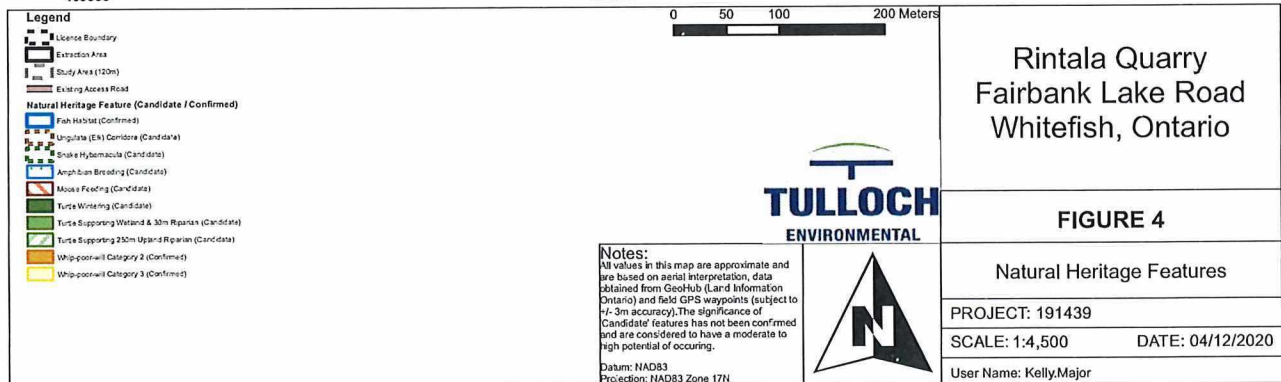
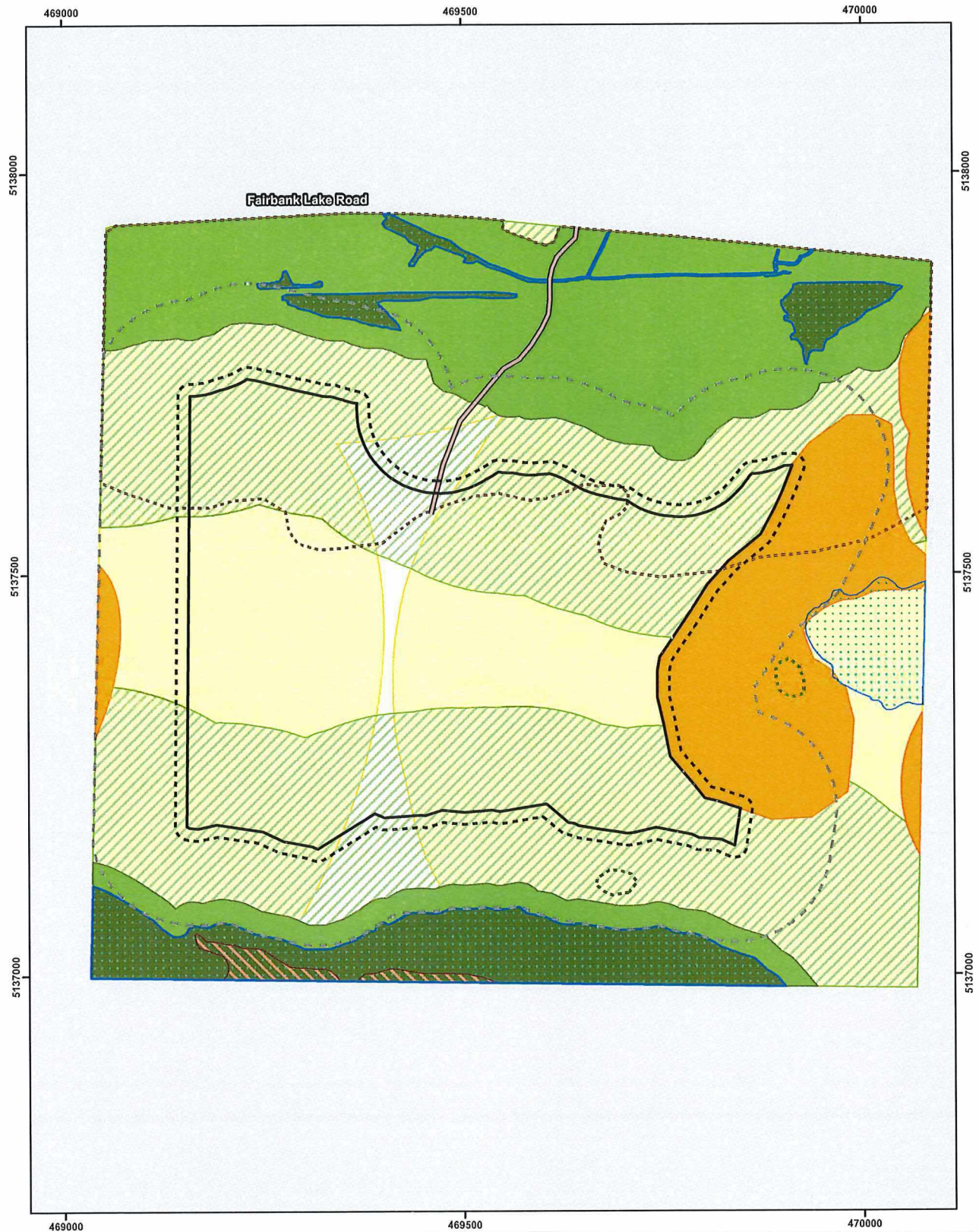
⁴As defined by the Significant Wildlife Habitat Technical Manual (MNR 2000) and Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (MNR 2015a).

⁵As defined by the Fisheries Act (R.S.C., 1985, c. F-14)

⁶As defined by the Migratory Birds Convention Act (MBCA; S.C. 1994, c. 22)







3. IMPACT ASSESSMENT, AVOIDANCE AND MITIGATION

Potential impacts and mitigation measures intended to avoid / minimize those impacts are provided in this section for all Natural Heritage features identified during the NEL1 studies. Residual impacts, anticipated once mitigation measures have been implemented, are also discussed. Credentials of NEL2 reporting staff are identified in Appendix B.

This NEL2 is based on preliminary Site plans produced by Tulloch Engineering and dated November 11, 2020 (Appendix A). If the scope or approach of this undertaking changes, the findings of this NEL2 study may be rendered inaccurate or invalid.

3.1 Habitat Loss and Preservation

The Extraction Area includes 28.0ha of naturalised habitat classified according to nine (9) ecosite types (Table 2). All ecosites proposed for extraction are common to Ecoregion 5E. The ecological functions of this habitat are discussed in detail in the sections to follow. Vegetation will be removed from the site on a phase-by phase basis (3 phases total). This will ensure that vegetation removal occurs incrementally over the lifespan of the Project.

Table 2 – Ecosite composition of the Extraction

Ecosite Code	Description	Total Area of Loss (ha)
G011TI	Red/White Pine Conifer (Low Treed, Shallow Soils)	0.65
G016TI	Aspen/Birch Hardwood (Low Treed, Shallow Soils)	0.74
G018TI	Maple Hardwood (Low Treed, Shallow Soils)	4.86
G097Tt	Red/White Pine Conifer (Tall Treed, Fresh Fine Soils)	1.34
G104Tt	Aspen/Birch Hardwood (Tall Treed, Fresh Fine Soils)	15.31
G116Tt	Spruce/Fir Conifer (Tall Treed, Moist Fine Soils)	0.36
G119Tt	Aspen/Birch Hardwood (Tall Treed, Moist Fine Soils)	2.30
G134S	Thicket Swamp (Mineral Soils)	1.38
G223TI	Intermediate Conifer Swamp (Tall Treed, Mineral Soils)	1.02
TOTAL	All Ecosites within the Extraction Area	28.0

Several important areas of habitat will be preserved on and around the Site. Three large wetland complexes will be retained on / around the Site. Wetlands north of the Extraction Area include 13.3ha of habitat within the Property (ecosites G130Tt, G135S and G144N) and they extend for approximately 500m and 1000m to the east and west, respectively (along the south side of Fairbank Lake Road). Wetlands to the south of the Site include 17.7ha of habitat within the Property (ecosites G149N and G150N) and extend for approximately 400m and 2000m to the

east and west, respectively. Wetlands east of the Extraction Area are almost entirely outside of the Property and they extend approximately 1200m to the east.

Upland riparian forest adjacent these three wetland complexes will be retained and left unaltered. This includes areas within 100m from the northern complex, 120m from the southern complex, and 120m from the eastern complex. Together, these setbacks total 26.4ha of upland riparian forest to be preserved within the Property.

The Property also extends 320m south of the southern wetland complex. Those areas (approximately 26.2ha) were not part of the NEL1 studies and will not be subject to operations as part of this Project.

For context, the proposed Extraction Area accounts for approximately 25% of the Property (28.0ha of 113.2ha) that exists south of the Fairbank Lake Road.

3.2 Wetlands

The Proponent has committed to retain and set back from any wetlands that could qualify as Provincially Significant in order to forgo OWES evaluations and to preserve this potentially sensitive habitat. The OWES determines wetland significance based on the biological, hydrological, and social functions it supports, as well as the presence / absence of special features such as SAR. NEL1 studies found large wetland complexes to the north, south and east of the Site would require OWES evaluations to determine provincial significance. Two small wetlands (<2ha) within the Extraction Area (G135S and G223S) are not eligible for OWES evaluation and therefore do not qualify for provincial significance.

This section deals with wetland water quality and quantity, which is important for maintaining habitat quality. Wildlife who may occupy or use these wetlands are dealt with individually in sections to follow.

3.2.1 *A Priori Avoidances*

The proponent has committed to the following avoidances in advance of the project planning and has asked that they be incorporated into the project design.

- No operations will occur in the large wetland complexes to the north, east or south.
- All operations will set back 120m for the southern wetland complex.
- All operations will set back 120m for the eastern wetland complex.
- All operations will set back 100m for the northern wetland complex.
- All extraction will remain above the water table.

3.2.2 *Potential Impacts (in the Absence of Avoidance and Mitigation)*

With *a priori* commitments in place, this Project will not alter the northern, eastern and southern wetland complexes and it has a low risk of negatively impacting these complexes. None-the-less, the following impacts are reasonably foreseen as a result of this Project. These impacts assume no other avoidance or mitigations:

- **Loss of Two Small Wetlands.** Two small wetlands (G134S and G223TI) will be lost, totaling 3.1ha of wetland habitat. These wetlands do not qualify for consideration as provincially significant and have been confirmed to be free of significant Natural Heritage features.
- **Surface Wetland Contamination.** Quarrying is not a high-polluting activity, but operations could mobilize sediments that, if allowed to enter into wetlands and natural waterways, could reduce water quality. Moreover, equipment used on Site will require fuels, lubricants and other substances that could be deleterious to the environment if not contained.
- **Groundwater Contamination.** Quarrying is not a high-polluting activity, but equipment used on Site will require fuels, lubricants and other substances that could be deleterious to the environment if allowed to enter groundwater.
- **Invasive Plant Species.** Operations will be set back from wetlands but equipment accessing the Site via the existing driveway could proliferate invasive plant species if seed from off-site is transported to Site on equipment.
- **Species-specific Impacts.** Operations could impact species who rely on wetland habitat for critical life functions. Individual species impacts are discussed in the sections to follow.

3.2.3 Avoidance and Mitigation Commitments

The proponent will commit to the following avoidances and mitigations:

- **No Work in Wetlands.** At no time will work be undertaken within the northern, eastern or western wetland complexes.
- **Sediment Control.** Site operations will be performed at 100m or greater distance from wetlands and surface water features. Should any work (e.g. access driveway maintenance) be undertaken within 30m of a wetland or watercourse, a sediment control plan will be prepared and enacted to ensure that any sediments mobilized by the activity are contained on the worksite and not allowed to enter adjacent wetted habitat.
- **Spills Prevention and Control.** The Site, once operational, will prepare and implement a Spills Prevention Plan that will reduce the potential for spills on Site and provide procedures for properly isolating, remediating and reporting spills, should they occur. This plan will include, at minimum:
 - No deleterious substances (e.g. fuels, lubricants, solvents, paints, etc.) are to be stored within 30m of a wetland or waterbody.
 - No vehicles or equipment are to be fueled within 30m of a wetland or waterbody.
 - All vehicles and equipment are to be kept in good mechanical condition; free of fluid leaks.
 - One or more spills kits are to be kept on Site and staff will be trained in its proper use.
 - Hazardous waste will be properly handled, stored and disposed of.
 - Spills will be reported to the Ontario's Spills Action Centre at 1-866-MOETIPS (663-8477).
- **Passive Water Management.** The quarry is designed such that water collected on Site will flow to one of two collection points: Phase 1 (south side of quarry) will flow south and collect at the southern extreme of the Site. Phases 2 and 3 (north side of quarry) will flow north and collect at the north side of the Site. These collection points will then be allowed to settle, and eventually recharge local groundwater. There will be no active pumping of Site water into the environment.
- **Groundwater Protection.** Water collected within the Site as the result of passive water management will be safeguarded against contamination but deleterious substances such as fuels, lubricants, paints and solvents. Any sheens observed on these waters will be immediately contained and cleaned.
- **Clean Equipment.** Equipment should be brought to Site clean. Soil and debris deposited on equipment from other sites should be washed off at an off-site location (>30m from a waterbody) prior to arrival. This will prevent the spread of invasive plant species by limiting the spread of seed.
- Blanding's and other turtles are addressed in Section 3.5.
- Endangered bats are addressed in Section 3.6.

- Migratory birds and bird habitat are addressed in Section 0.
- Amphibian breeding is addressed in Section 3.8.
- Cervid movement is addressed in Section 3.9.
- Fish and fish habitat are addressed in Section 3.10.

3.2.4 *Net Impacts (After Avoidance and Mitigations)*

With all avoidance and mitigations on place, the net impacts of this project on wetlands will be the loss of two small wetlands (G134S and G223TI) totaling 3.1ha. These wetlands do not qualify for provincial significance and they do not support any significant or protected habitat types.

Wetland habitat is locally abundant. Wetland complexes to the north and south total 31.0ha within the Property and both complexes extend off the property for hundreds of metres to the east and west. While these small wetlands will likely support some local ecological functions (e.g. bat foraging, low-levels of amphibian breeding), ample wetland habitat will remain in immediate vicinity to ensure these functions can continue once the Site is operational. See the sections to follow.

Water levels within the large northern, eastern and southern wetland complexes are controlled by surface watercourse flow (and beaver damming within those watercourses) that will not be impacted by this Project. This project will also remain above the groundwater table. The passive water management system included in the Site design ensures that no active pumping of Site water into the environment is required; reducing the potential for sediment loading into the wetlands or wetland scour at the pump outlets.

Quarrying is not a high-polluting activity, but operations could mobilize sediments and onsite equipment will require fuels, lubricants and other substances that could be deleterious to the environment if not contained. Site operations will be set back 100 to 120m from all wetlands and waterbodies which means the Project is at low risk of contaminating these features. None-the-less, industry standard sediment controls and spills prevention / response will ensure that deleterious substances are properly and safely stored, handled and disposed of.

Provincial guidelines suggest that appropriate upland riparian setbacks around wetlands vary depending on the ecological functions associated with each wetland (MNRF 2005). A 120m setback was selected for the eastern and southern wetland complexes as this is the provincially recommended setback from Provincially Significant Wetlands and the common definition 'adjacent lands' adopted by the Natural Heritage Reference Manual (MNRF 2005).

A slightly smaller setback of 100m was selected for the northern wetland complex. This setback was selected for the following reasons:

- **Site Topography.** Site topography (see Drawing 1, Appendix A) has a ridge of land approximately 100m wide that runs parallel the southern edge of the northern wetland complex. The Site then swales to lower elevation south of that ridge (wetlands G134S and G223TI are include in that swale) before raising again to highpoints located in the southern half of the Extraction Area. A 100m setback best conforms to this topography and retains a ridge of bedrock knoll between Site operations and the northern wetland complex.
- **Ecological Functions.** OWES evaluations were not performed on any wetland complex within or adjacent the Study Area, but ecological functions are best understood for this northern complex owing to Site reconnaissance throughout, ELC studies, aquatic habitat assessment and incidental observations. Confirmed ecological functions (i.e. fish habitat) and candidate habitat (e.g. candidate turtle or amphibian habitats) are associated with areas of shallow drains between the rail and road right-of-ways and in pockets of standing water to the east and west sides of the NEL1 Study Area. Conversely, the hardwood swamp (G130TI) and non-wetted portions of the thicket swamp (G135S) and meadow marsh (G144N) along the south side of the wetland complex are considered less sensitive to Site operations.
- **Project Impacts.** As identified above, this project is considered to have a low risk of impacting water quantity and quality within the northern wetland complex. Mitigations are also provided below to further reduce Project impacts and to time certain actions (e.g. land clearing) to avoid important life stages of species that could be using this wetland area.

As indicated in Section 1.1 (above) an ecological approach was taken to establishing the proposed Licence and Extraction Areas for this Project. An initial opportunities and constraints assessment resulted in the Proponent committing *a priori* to retain the northern, eastern and southern wetland complexes and environmental professionals at Tulloch proposed and delineated the Extraction Area for this Project in a manner that avoided known and candidate Natural Heritage features. The result of this approach is that the layout of the Extraction Area is free of Natural Heritage features, is low risk to neighboring ecological functions, and the majority of the property (75%) will remain undeveloped and unaltered.

Collectively, the above avoidance and mitigations combined with those of the sections below, demonstrate that this Project is designed, and will be undertaken in a manner, that will not negatively impact the ecological functions of adjacent wetland complexes and will remain compliant with Section 2.1 of the PPS.

3.3 Eastern Whip-poor-will

Three (3) Eastern Whip-poor-will defended territories were estimated to intersect the NEL1 Study Area, and one (1) intersects with the Licence Boundary (Figure 4). The Extraction Area was delineated to avoid all defended territories. Most calling males appeared to be defending territories in proximity to wetlands east of the Study Area and north of Fairbank Lake Road. Most of the Extraction Area (27.7ha) qualifies as Category 3 Habitat for Eastern Whip-poor-will.

3.3.1 *A Priori Avoidances*

- **Territory Avoidance.** The Extraction Area was delineated to avoid all Eastern Whip-poor-will defended territories (Categories 1 and 2 habitats). No defended territories will be lost or altered.
- **Forage Habitat Retained.** Retention of northern, eastern and southern wetland complexes along with 100-120m of riparian forest will ensure that Category 3 (Feeding) Habitat remains locally abundant.

3.3.2 *Potential Impacts (in the Absence of Avoidance and Mitigation)*

The following impacts could result from project operations if no other avoidance or mitigation measures are applied:

- **Reduced Reproduction.** The clearing of vegetation, if performed while Eastern Whip-poor-will are nesting in vicinity to the Site, could stress the species and result in decreased reproductive success.
- **Subsidized Predation.** The generation of waste on Site (such as household-type refuse and food scraps) could result an increase in the local abundance of certain wildlife species that are predators to Eastern Whip-poor-will or their young / eggs. Examples include crows, racoons and foxes. This could indirectly result in a greater Whip-poor-will mortality or decreased reproductive success.

3.3.3 *Avoidance and Mitigation Commitments*

The Proponent will commit to the following avoidance and mitigation measures to eliminate or minimize impacts identified above:

- **Restricted work during the General Nesting Period.** No clearing of vegetation will occur during the General Nesting Period which is considered to be from April 8 to August 28 according to Environment and Climate Change Canada (Nesting Zone C3; Forested). This will ensure that this disruptive activity will not be undertaken when the local Whip-poor-will population is reproducing.
- **Contain all refuse on Site.** All refuse generated on Site (including food scraps) will be contained such that it is not accessible to wildlife. Staff will not be allowed to feed to the local wildlife.
- **Safe SAR Encounters.** If Eastern Whip-poor-will is encountered at any time on Site, any work that could harm or harass the species will stop and the species will be allowed to vacate on its own accord. SAR encountered should be reported to the MECP via the form provided in Appendix C.

3.3.4 *Net Impacts (After Avoidance and Mitigations)*

All Eastern Whip-poor-will Categories 1 and 2 habitats will be avoided; no defended territories (nesting habitat) will be altered. Whip-poor-will defended territories are estimated based on the locations at which males were observed calling on multiple evenings, habitat suitability to support nesting, and a minimum territory size adjusted to 9ha. The location of the retained defended territory adjacent the east side of the Extraction Area is some of the most ideal nesting habitat on Site for this species.

A total of 27.7ha of Category 3 Habitat for Whip-poor-will will be lost. Category 3 Habitat for this species supports movement and feeding and is considered to have the highest tolerance to alteration. Whip-poor-will forage habitat is locally abundant, and the best quality foraging habitat is situated in the large wetland complexes to the north, east and south of the Extraction Area. Whip-poor-will are aerial insectivores that forage nocturnally using only their vision to locate prey. These large wetlands are best suited to foraging by Whip-poor-will due to their open flyways, improved sightlines and denser populations of insects (which emerge from the wetlands). Retaining these large wetland complexes will ensure that quality forage habitat remains abundant on the landscape.

Whip-poor-will movement around the Site will be safeguarded through the retention of the large wetland complexes to the north, east and south, as well as the retentions of large 100-120m forested upland setbacks around those complexes. These upland setback total 26.4ha of riparian forest that will be retained on Site.

Project operations in proximity to Whip-poor-will habitat will be modified to reduce impacts during sensitive periods of the year; land clearing will be saved for periods when the species is not reproducing or has migrate south for the winter months.

Collectively, these avoidances and mitigations are designed to ensure than an ecologically relevant quantity of critical nesting habitat is retained for Whip-poor-will based on known habitat needs and Site occupancy demonstrated by the species in 2020. The integrity of this critical habitat will be supported by quality forage habitat retained in immediate vicinity as well as modified Site operations tailored to the annual reproductive cycle of the species. These practices will safeguard species and will preserve the ecological function of the Site to support Whip-poor-will, ensuring that the project can proceed in a manner that is compliant with Sections 9 and 10 of the Endangered Species Act, respectively, as well as Section 2.1 of the PPS.

3.4 Bank Swallow

Bank Swallow (*Riparia riparia*; Threatened) was not found within the Study Area during the NEL1 studies, but the species commonly occupies aggregate sites after they have become active. This section is intended to provide best practices to safeguard Bank Swallow from future operations by preventing the species from nesting within active portions of the Site.

3.4.1 Preventing Bank Swallow Nesting

Stockpiled materials intended for long-term storage should be sloped to 70 degrees or less to ensure they remain unsuitable for nesting by Bank Swallow. Similarly, the excavated sides of the extraction area should be sloped to 70 degrees or less. Stockpiled materials stored for long periods of time should also be vegetated or covered with tarpaulin material.

3.4.2 Reacting to Bank Swallow Nesting on Site

If Bank Swallows nest within the Site, operations must be altered to ensure that the species is not harmed or harassed, and their nests must not be damaged. A plan may be prepared to remove the species from the Site. Regulations under the Endangered Species Act (O. Reg. 242/08) permits aggregate operations to remove Bank Swallow nesting colonies within the Operational Area provided that (1) the species occupied the Site after operations were underway, (2) prior to taking action, the activity is registered under the Endangered Species Act, (3) an appropriate mitigation plan is prepared and followed that will ensure that reasonable steps are taken to minimize adverse effects on the species, and (4) the activity is properly monitored and reported. Before taking any actions involving a Threatened species, it is highly recommended that the MECP and/or a qualified biologist is consulted for guidance. See O. Reg. 242/08 for further details.

3.5 Blanding's Turtle and Turtle Habitat

Suitable habitat for pond turtles, including Blanding's Turtle, was observed to the north and south of the Study Area (Figure 4). Potentially suitable turtle overwintering habitat was found in some sections of the wetland complex abutting the south side of Fairbank Lake Road. Flooded sections of ecosites G144N and G135S were observed in association with drains along the rail right-of-way, drains between the rail track and Fairbank Lake Road, and two flooded areas at the east and west side of the Study Area. The remainder of these wetland ecosites are not considered suitable for turtle wintering owing to an observed lack of standing water in fall 2019 and spring 2020.

Based on these observations, ecosites G149N and G150N, as well as portions of G135N and G144N were considered candidate turtle wintering habitat for up to three species: Blanding's Turtle, Midland Painted Turtle (*Chrysemys picta marginate*) and Snapping Turtle (*Chelydra*

serpentina; Special Concern). Other wetlands on / around the Study Area (G134S, G223S and G129TI) did not support sufficient standing water to allow for turtle wintering.

Without confirmed absence, candidate turtle wintering habitat must be considered potential SWH for that purpose. As Blanding's Turtle may be present, this candidate wintering habitat must also be considered candidate Category 1 Habitat for that species. As per the MNRF General Habitat Description, the remainder of those wetland complexes (and upland areas within 30m) should be considered candidate Category 2 Habitat for Blanding's Turtle (Figure 4). Areas within 220m of these candidate Category 1 and 2 Habitats should be treated as candidate Category 3 Habitat for Blanding's Turtle.

3.5.1 *A Priori Avoidances*

The proponent has committed to the following avoidances in advance of the project planning and has asked that they be incorporated into the project design.

- No operations will occur in the large wetland complexes to the north or south (ecosites G135N, G144N, G149N and G150N).
- All operations will set back 120m for the southern wetland complex.
- All operations will set back 120m for the eastern wetland complex.
- All operations will set back 100m for the northern wetland complex.

These *a priori* commitments ensure that all candidate SWH for turtle wintering and candidate Category 1 and 2 Habitats for Blading's Turtle will be preserved along with at least 70m of adjacent candidate Category 3 Habitat.

3.5.2 *Potential Impacts (in the Absence of Avoidance and Mitigation)*

The following impacts could result from project operations if no other avoidance or mitigation measures are applied:

- **Road Mortality.** Hauling along the access driveway could pose a risk of turtle mortality due to collisions with vehicles. The existing access driveway is not part of the ARA permit application, but this activity is discussed here so that best practices can be provided.
- **Subsidized Predation.** The generation of waste on Site (such as household-type refuse and food scraps) could result an increase in the local abundance of certain wildlife species that are predators to turtle or their eggs. Examples include crows, racoons and foxes. This could indirectly result in a greater turtle mortality or decreased reproductive success.
- **18.5ha of candidate Category 3 Habitat for Blanding's Turtle will be lost.** An estimated 55.6ha of candidate Category 3 Habitat exists on the Property with more in in immediate vicinity to the Property.
- **Wetland Water Quality and Quantity.** This subject is addressed in Section 3.2, above.

3.5.3 *Avoidance and Mitigation Commitments*

The Proponent will commit to the following avoidance and mitigation measures to eliminate or minimize impacts identified above:

- **Wildlife Signage.** "Watch for Wildlife" signs (similar to Figure 5) will be installed at the entrance of the Site access driveway and when exiting the Site onto the access driveway. The existing access driveway is not part of the ARA permit application, but this mitigation has been accepted as a committed best practice.
- **Limited Vehicular Speeds.** A speed limit of no more that 20km/hr will apply to the access driveway. The existing access driveway is not part of the ARA permit application, but this mitigation has been accepted as a committed best practice.
- **Staff Education.** As part of general Site orientation, staff will be educated about the potential for wildlife crossing the access driveway. Staff will be instructed to yield to wildlife. The existing access driveway is not part of the ARA permit application, but this mitigation has been accepted as a committed best practice.
- **Safe SAR Encounters.** Any Threatened or Endangered species found on Site will be reported to the MECP. Any work that could harm or harass a Threatened or Endangered species will be halted and the species will be allowed to leave on its own accord.
- **Safe Relocation of non-SAR.** If a non-Threatened or Endangered species of turtle is encountered on Site, it may be carefully removed to the nearest safe and suitable habitat.
- **Contain all refuse on Site.** All refuse generated on Site (including food scraps) will be contained such that it is not accessible to wildlife. Staff will not be allowed to feed to the local wildlife.

- **Wetland Water Quality and Quantity.** This subject is addressed in Section 3.2, above.

3.5.4 Net Impacts After Avoidance and Mitigation

The presence of turtles within the NEL1 Study Area is not known. The approach adopted by this project is to assume presence and to restrict project design and operations based on that assumption. These restrictions include retaining all habitat that could support significant turtle habitat, retaining the remainder of the complexing wetlands, and retaining large 100 to 120m setbacks of upland riparian forest. The only activity to occur in vicinity to turtle habitat will be vehicles and equipment utilizing the existing access driveway. The existing access driveway is not subject to the ARA permit application. Committed mitigations for this activity are none-the-less provided, including proper signage, speed limits and staff education will ensure that the risk of road mortalities is kept low.

All (100%) of candidate Categories 1 and 2 Habitat for Blanding's Turtle will be preserved and left unaltered. Areas that are 230m from the edge of Categories 1 and 2 Habitats (30m to 250m from the wetland) are considered candidate Category 3 Habitat for the species. An estimated 55.6ha of candidate Category 3 Habitat exists on the Property in relation to the northern and southern wetland complexes, and this habitat extends well beyond the property. Category 3 Habitat is used by Blanding's Turtle for movement between wetlands and is considered to have the greatest tolerance to alteration (MNRF 2017). A loss of 18.5ha of candidate Category 3 Habitat is expected which would amount to a 33% decrease in available habitat within the Property. The retention of 68% of this habitat within the property coupled with large quantity of similar habitat beyond the Property will ensure that this habitat type remains locally abundant. The retention of 100 to 120m of riparian forest buffer around the wetlands will maintain habitat connectivity between the northern and eastern wetland complexes, and between the eastern and southern complexes.

Collectively, these avoidances and mitigations will safeguard turtles (if present) and will preserve the ecological function of the Site to support turtle populations. This will ensure that the project can proceed in a manner that is compliant with Section 2.1 of the PPS and the Endangered Species Act.



Figure 5 – Example of the cautionary signage that will be installed on the Site access driveway.

3.6 Endangered Bats and Bat Habitat

Three species of Endangered bat are expected to occur in the Sudbury District: Little Brown Myotis (*Myotis lucifugus*), Eastern Small-footed Myotis (*Myotis leibii*) and Northern Long-eared Myotis (*Myotis septentrionalis*). Of greatest conservation concern for Endangered bats are the loss of large (>25 cm DBH) living and dead-standing cavity trees that can support bat maternity roosting, and caves that can serve as bat hibernacula (MNR 2011, MNR 2015b). No caves or high-quality maternity roosting habitat were found within the Study Area.

Endangered bat species forage throughout the night; predominantly along forest edges and over wetlands. These species will rest individually (or in small groups) during the day in day-roosts that are typically located in cracks and crevices located in trees, rocks and buildings. Foraging and day-roosting are transient behaviours as bats will re-locate frequently (Harvey et al 2011, Thorne 2017). All wooded ecosites on Site and wetlands adjacent the Site could provide foraging and day-roosting habitat for Endangered bat species. The best foraging habitat is located within the large wetland complexes on Site. Preferred day-roosting habitat is typically in proximity to good forage habitat. Species presence has not been confirmed, but the potential for foraging and / or day-roosting by Endangered bat species on Site is considered high.

3.6.1 *A Priori Avoidances*

The proponent has committed to the following avoidances in advance of the project planning and has asked that they be incorporated into the project design.

- **Forage and Day-roost Habitat Retained.** Retention of northern, eastern and southern wetland complexes along with 100-120m of riparian forest will ensure that prime forage and day-roost habitat remains abundant on Site.

3.6.2 *Potential Impacts (in the Absence of Avoidance and Mitigation)*

The following impacts could result from project operations if no other avoidance or mitigation measures are applied:

- **Mortality do to clearing vegetation.** The removal of cavity trees could result in the direct mortality of male and non-gravid female bats occupying transient day-roosts if the work is performed while bats are active on Site.
- **Loss of forage habitat.** Loss of up to 28.0ha of habitat suitable for foraging and / or day-roosting by Endangered bat species.
- **Day-roosting in Machinery.** Day-roosting by Endangered bat species does not occur exclusively in naturalised habitat but can also occur in many spaces that are sheltered from the sun and rain. Operations on Site could result in Endangered bat species day-roosting within equipment on Site, parked vehicles, or built structures. If Site staff are unaware of the ecological importance of these species, or their protected status, these species could be harassed or harmed via human persecution.

3.6.3 *Avoidance and Mitigation Commitments*

The Proponent will commit to the following avoidance and mitigation measures to eliminate or minimize impacts identified above:

- **Restricted work during the bat active period.** The removal of woody vegetation on Site will not occur during periods when bats may be active in the area (May 1 to September 1; MNR 2015b).
- **Safe Bat Encounters.** Site staff will remain vigilant for bats that may day-roost on buildings or machinery left on Site. Should a bat be discovered within the Site, work will be altered (or stopped, if necessary) to ensure the species is not harmed or harassed. The species must be provided an opportunity to leave the Site on its own accord. If the species cannot / will not leave the Site, the MECP must be contacted for further instruction. It should be noted that bat species can be difficult to identify without training. As half of Ontario's bat species are considered Endangered, all bats encountered within the Site should be treated as potentially protected.

3.6.4 Net Impacts After Avoidance and Mitigation

Timing restrictions will ensure that all vegetation removal occurs when bat species are not present on Site and will thereby ensure that all direct threats to bats are avoided. Up to 28.0ha of bat foraging and day-roosting habitat exists within the Extraction Area, which will be altered or removed over the course of the Project.

Bats, including *Myotis* species, frequently forage over long distances each evening; sometimes in excess of 1000 m (Toby Thorn, author of *Bats of Ontario*, personal communications). Bat forage habitat is locally abundant, and the best quality foraging habitat is situated in the large wetland complexes to the north, east and south of the Extraction Area. Bats are aerial insectivores that forage nocturnally using echolocation to locate prey. These large wetlands are best suited to foraging by bats due to their open flyways, improved sightlines and denser populations of insects (which emerge from the wetlands). Retaining these large wetland complexes will ensure that quality forage habitat remains abundant on the landscape.

Bats preferentially day-roost in proximity to their preferred forage areas (Harvey *et al* 2011, Thorne 2017). Retaining large 100m-120m of upland forest around the large wetland complexes to the north, east and south will ensure that day-roosting habitat is retained. These setbacks will also provide a large visual and acoustic barrier between foraging / day-roosting habitats and the operations. Together, these upland setback total 26.4ha of riparian forest that will be retained on Site. An additional 26.2ha of upland forest habitat will be retained on the Property south of the southern wetland complex; this southmost portion of the property was not included within the NEL1 studies.

Ontario's Endangered bats are not habitat limited species but are instead in decline as the result of fungal infections (i.e. White Nose Syndrome) invading hibernation habitat (Harvey *et al*, 2011, Thorne 2017). Bat habitat is locally abundant. Aerial imagery suggests that the Site is situated on a landscape with expanses of contiguous forested habitat on all sides. Ecosites classified throughout the proposed Extraction Area are common for the region. It is therefore reasonable to assume that any Endangered bats foraging and day roosting within / around the proposed Extraction Area are not constrained to, or limited by, habitat within the Site.

Collectively, these avoidances and mitigations will safeguard Endangered bats (if present) and will preserve the ecological function of the Site to support their foraging and day-roosting habits. This will ensure that the project can proceed in a manner that is compliant with Sections 9 and 10 of the Endangered Species Act as well as Section 2.1 of the PPS.

3.7 Migratory Birds and Bird Habitat

A total of 50 bird species were observed within the NEL1 Study Area. Bird observations resulted from a combination of incidental encounters, acoustic nocturnal surveys and automated songmeter recordings (at dawn and in the evening) conducted over Fall 2019 and Spring / Summer 2020. Aside from Eastern Whip-poor-will (discussed in Section 3.3, above), no other at-risk bird species were observed on Site.

Most of the bird species (40 of the 50 species) observed on Site are considered migratory species under the federal Migratory Birds Convention Act. This Act provides protections for migratory birds as well as their broods and active nests. The potential for migratory bird nesting to occur within the Extraction Area is considered high. The proposed extraction area for this Site includes up to 28.0ha of suitable nesting habitat for migratory bird species.

Waterfowl Nesting areas are a type of specialized habitat that can qualify as SWH. Work within or adjacent SWH is regulated by the PPS. No waterfowl were observed during the NEL1 studies, but waterfowl nesting is considered possible in proximity to the large southern wetland complex.

3.7.1 *A Priori Avoidances*

The proponent has committed to the following avoidances in advance of the project planning and has asked that they be incorporated into the project design.

- No operations will occur in the large wetland complexes to the north, east or south.
- All operations will set back 120m for the southern wetland complex.
- All operations will set back 120m for the eastern wetland complex.
- All operations will set back 100m for the northern wetland complex.

3.7.2 *Potential Impacts (in the Absence of Avoidance and Mitigation)*

The following impacts could result from project operations if no other avoidance or mitigation measures are applied:

- **Active Nest Destruction.** If vegetation is cleared on Site while migratory bird species are actively nesting in the area then that action could result in the direct risk of mortality to migratory birds, their nests and broods.
- **Reduced Reproduction.** The clearing of vegetation, if performed while migratory bird species are nesting in vicinity to the Site, could stress the species and result in decreased reproductive success.
- **Subsidized Predation.** The generation of waste on Site (such as household-type refuse and food scraps) could result an increase in the local abundance of certain wildlife species

that are predators to birds or their young / eggs. Examples include crows, raccoons and foxes. This could indirectly result in a greater bird mortality or decreased reproductive success.

- **Loss of Nesting Habitat.** Loss of up to 28.0ha of habitat suitable for nesting by migratory bird species.

3.7.3 Avoidance and Mitigation Commitments

The Proponent will commit to the following avoidance and mitigation measures to eliminate or minimize impacts identified above:

- **Restricted work during the General Nesting Period.** No clearing of vegetation will occur during the General Nesting Period which is considered to be from April 8 to August 28 according to Environment and Climate Change Canada (Nesting Zone C3; Forested). This practice will ensure this action does not present a risk of harm to migratory birds or their nests. This practice will also ensure that this disruptive activity is not undertaken when the local bird populations are reproducing in vicinity.
- **Phased Vegetation Removal.** Vegetation will be removed from the site on a phase-by phase basis (3 phases total). This will ensure that vegetation removal occurs incrementally over the lifespan of the Project; not all at once.
- **Contain all refuse on Site.** All refuse generated on Site (including food scraps) will be contained such that it is not accessible to wildlife. Staff will not be allowed to feed to the local wildlife.
- **Worksite boundaries.** Boundaries of the work areas will be clearly identified and marked to ensure habitat destruction does not extend beyond areas indicated in Site plans.

3.7.4 Net Impacts After Avoidance and Mitigation

Timing restrictions will ensure that all vegetation removal occurs when migratory birds are not nesting on Site and will thereby ensure that all direct threats to migratory bird species, their nests, and their eggs, are avoided. This will ensure compliance with the Migratory Birds Convention Act.

A net loss of 28.0ha of habitat suitable for nesting by migratory bird species is expected. Bird nesting habitat associated with large wetland complexes to the north, east and south will be retained along with 100-120m setbacks of upland riparian forest. In particular, waterfowl preferentially nest within riparian forests that occur within 120m a waterbody or wetland (MNR 2015a). Riparian forest adjacent the southern wetland complex are most likely to support waterfowl nesting owing to the size and quality of the open water marshes (G150N) present within that wetland complex. A full 120m of riparian forest will be retained adjacent the southern complex to ensure this ecological function can continue (if present).

An additional 26.2ha of upland forest habitat will be retained on the Property south of the southern wetland complex; this southmost portion of the property was not included within the NEL1 studies. As discussed in Section 3.1 (above), the Extraction Area accounts for only 25% of the Property south of the Fairbank Lake Road (28.0ha of 113.2ha). The remainder of the property will remain undeveloped and naturalised habitat.

Collectively, the strategic retention of habitat combined with modified Site operations tailored to the annual reproductive cycle of the species will safeguard migratory bird species, will minimize impacts to their habitat and retain habitat for continued Site use (including by waterfowl nesting, if present). This will ensure that the Project can proceed in a manner than is compliant with Section 2.1 of the PPS.

3.8 Amphibian Habitat

Amphibian breeding could be significant within portions of the large northern, eastern and western wetland complexes. Specifically, portions of wetlands supporting permanent standing water or seasonal flooding could support breeding by various frog and salamander species. Significance is not known. Where significant levels of breeding occurs, SWH for amphibians in wetlands are considered the ELC ecosite in which the breeding is taking place (MNRF 2015a).

3.8.1 *A Priori Avoidances*

The proponent has committed to the following avoidances in advance of the project planning and has asked that they be incorporated into the project design.

- No operations will occur in the large wetland complexes to the north, east or south.
- All operations will set back 120m for the southern wetland complex.
- All operations will set back 120m for the eastern wetland complex.
- All operations will set back 100m for the northern wetland complex.

3.8.2 *Potential Impacts (in the Absence of Avoidance and Mitigation)*

The following impacts could result from project operations if no other avoidance or mitigation measures are applied:

- **Road Mortality.** Hauling along the access driveway could pose a risk of amphibian mortality due to collisions with vehicles. The existing access driveway is not part of the ARA permit application, but this activity is discussed here so that best practices can be provided.
- **Subsidized Predation.** The generation of waste on Site (such as household-type refuse and food scraps) could result an increase in the local abundance of certain wildlife species

that are predators to amphibians. Examples include crows, raccoons and foxes. This could indirectly result in greater amphibian mortality.

- **Wetland Water Quality and Quantity.** This subject is addressed in Section 3.2, above.

3.8.3 Avoidance and Mitigation Commitments

The Proponent will commit to the following avoidance and mitigation measures to eliminate or minimize impacts identified above:

- **Wildlife Signage.** “Watch for Wildlife” signs (similar to Figure 5) will be installed at the entrance of the Site access driveway and when exiting the Site onto the access driveway. The existing access driveway is not part of the ARA permit application, but this mitigation has been accepted as a committed best practice.
- **Limited Vehicular Speeds.** A speed limit of no more than 20km/hr will apply to the access driveway. The existing access driveway is not part of the ARA permit application, but this mitigation has been accepted as a committed best practice.
- **Staff Education.** As part of general Site orientation, staff will be educated about the potential for wildlife crossing the access driveway. Staff will be instructed to yield to wildlife. The existing access driveway is not part of the ARA permit application, but this mitigation has been accepted as a committed best practice.
- **Contain all refuse on Site.** All refuse generated on Site (including food scraps) will be contained such that it is not accessible to wildlife. Staff will not be allowed to feed to the local wildlife.
- **Wetland Water Quality and Quantity.** This subject is addressed in Section 3.2, above.

3.8.4 Net Impacts After Avoidance and Mitigation

The presence of significant levels of amphibian breeding within the NEL1 Study Area is not known. The approach adopted by this Project is to assume presence and to restrict project design and operations based on that assumption. If significant levels of breeding is present, the SWH would be defined to include the ELC ecosite in which the breeding is taking place (MNR 2015a). This Project is retaining these ELC ecosites (i.e. G135S, G144N, G130TI, G149N and G150N) as well as large 100 to 120m setbacks of upland riparian forest. This exceeds provincial standards for this feature type.

The only activities which will occur in vicinity to amphibian habitat will be vehicles and equipment utilizing the existing access driveway. The existing access driveway is not subject to the ARA permit application. Committed mitigations for this activity are none-the-less provided, including proper signage, speed limits and staff education will ensure that the risk of road mortalities is kept low.

Collectively, these avoidances and mitigations will safeguard amphibians and will preserve the ecological function of the Site to support breeding. This will ensure that the project can proceed in a manner that is compliant with Section 2.1 of the PPS.

3.9 Cervid Habitat

The NEL1 Study Area exhibited an abundance of Elk signs, including tracks, trails, scatts, beds rubs and scrapes. This sign was most concentrated in the wetlands north of the Extraction Area and adjacent woodland. Tulloch also encountered two anecdotal testimonials of Elk presence; (1) by rail workers who noted they frequently observed Elk crossing Fairbank Lake Road and within the wetland complex adjacent the rail right-of-way, and (2) an off-duty Tulloch employee who performed a roadside Elk call in front of the Study Area and successfully attracted a mature bull male. This bull male emerged from the north into the meadows north of Fairbank Lake Road (Emily Wyszynski, personal communication).

These observations are interpreted by Tulloch to suggest that wetland and riparian woodland areas abutting Fairbank Lake Road are being used as a movement corridor for Elk (Figure 4). This movement corridor does not fit the definition of a Cervid Movement Corridor provided in the SWH Criterion Schedule for Ecoregion 5E as that definition does not include Elk. Elk are also not protected as at-Risk species. None-the-less, Tulloch recommends retaining some habitat to ensure that Elk movement is not inhibited once operations are underway.

The large wetland complex south of the Study Area supports a large area of open water marsh (ecosite G150N) with floating vegetation that qualifies as a candidate Moose Aquatic Feeding Area. This area is outside of the Study Area and was not assessed for significance (Figure 2). None-the-less, from the perspective of this Project, Tulloch recommends that this area remains accessible to Moose. Should future work be proposed in proximity to this habitat (i.e. within 120m), it is advised the habitat quality and habitat use be assessed as per the provincial standards (MNR 2000).

3.9.1 *A Priori Avoidances*

The proponent has committed to the following avoidances in advance of the project planning and has asked that they be incorporated into the project design.

- No operations will occur in the large wetland complexes to the north and east.
- All operations will set back 120m for the southern wetland complex.
- All operations will set back 100m for the northern wetland complex.

3.9.2 *Potential Impacts (in the Absence of Avoidance and Mitigation)*

The following impacts could result from project operations if no other avoidance or mitigation measures are applied:

- **Reduction in Elk corridor size.** Elk corridor width will be reduced from 300-400m down to 180-300m.
- **Subsidized Predation.** The generation of waste on Site (such as household-type refuse and food scraps) could result an increase in the local abundance of certain wildlife species that are predators to cervids or their young. Black Bears (*Ursus americanus*) are an example. This could indirectly result in a greater cervid mortality or decreased reproductive success.
- **Habitat Avoidance.** Increased human presence on Site as the result of operations could result in habitat avoidance.
- **Vehicle Collisions.** Increased traffic on the access driveway could result in vehicle collisions with Elk or Moose. The existing access driveway is not part of the ARA permit application, but this activity is discussed here so that best practices can be provided.

3.9.3 *Avoidance and Mitigation Commitments*

The Proponent will commit to the following avoidance and mitigation measures to eliminate or minimize impacts identified above:

- **Wildlife Signage.** “Watch for Wildlife” signs (similar to Figure 5) will be installed at the entrance of the Site access driveway and when exiting the Site onto the access driveway.
- **Limited Vehicular Speeds.** A speed limit of no more than 20km/hr will apply to the access driveway.
- **Staff Education.** As part of general Site orientation, staff will be educated about the potential for wildlife (including Elk) crossing the access driveway. Staff will be instructed to yield to wildlife.

- **Contain all refuse on Site.** All refuse generated on Site (including food scraps) will be contained such that it is not accessible to wildlife. Staff will not be allowed to feed to the local wildlife.

3.9.4 Net Impacts (After Avoidance and Mitigations)

Elk movement will be maintained along Fairbank Lake Road through the preservation of the northern wetland complex and upland areas within 100m. When combined this results in the preservation of a movement corridor that ranges from 180m to 300m wide along the north side of the Extraction Area. Elk will also be able to circumvent the Site via the retained southern and eastern wetland complexes as well as their respective upland riparian setbacks.

The candidate Moose aquatic feeding area in the southern complex will be retained and left unaltered. Moose access to the feeding area will be maintained by a 120m upland riparian setback along the entire north side of that complex. That setback will also serve as a visual and acoustic screen between the feeding habitat and operations. Moose will also be able to access and egress from the feeding habitat via the south side of the wetland as no operations are proposed on portions of the property south of the southern wetland complex.

Traffic control on Site, including speed limits, signage and staff educations will safeguard cervid species from direct risks of harm. The existing access driveway is not subject to the ARA permit application.

Collectively, these mitigations and avoidances will minimize Project impacts on local Moose and Elk populations and maximize habitat functionality once the Project is underway. This will ensure compliance with Section 2.1. of the PPS as it relates to cervid habitat features.

3.10 Fish and Aquatic Habitat Adjacent the Site

The Proponent has committed to retain and setback from any permanent waterbodies identified as fish habitat. Fish habitat was confirmed in the wetlands to the north and south of the extraction area, as well as the ditching beside the rail right-of-way which flows under the established access driveway (Figure 3). Background searches, and on-Site fish habitat assessments did not identify any critical or sensitive fish habitat on the Site, or result in the identification of SAR fish species on Site. The proposed setbacks from identified fish habitat forgoes the requirement for DFO permitting or review on Site and requires no Authorization under the *Fisheries Act*.

Site operations will be set back 100 to 120m from all fish habitat, however access to the Site requires crossing over the ditch which runs under the access driveway to the south of the railway. If construction is required (e.g., maintenance) on the access driveway within 30m of known fish habitat, or has the potential to impact fish habitat, then DFO review may be required. Assistance by a qualified Fisheries Scientist is recommended for DFO permitting support. Furthermore, if at any point during the duration of the Project, Site operations begin to indirectly impact fish habitat (e.g., water level change, sedimentation from Site access), the requirement for DFO permitting or additional mitigation measures must be reevaluated.

3.10.1 A Priori Avoidances

The proponent has committed to the following avoidances in advance of the project planning and has asked that they be incorporated into the project design.

- No operations will occur in the large wetland complexes to the north, east or south.
- All operations will set back 120m for the southern wetland complex.
- All operations will set back 120m for the eastern wetland complex.
- All operations will set back 100m for the northern wetland complex.

3.10.2 Potential Impacts (in the Absence of Avoidance and Mitigation)

The following impacts could result from project operations if no other avoidance or mitigation measures are applied:

- **Fish Habitat Water Quality and Quantity.** This subject is addressed in Section 3.2, above.
- **Invasive Plant Species.** Operations will be set back from wetlands but equipment accessing the Site via the existing driveway could proliferation invasive plant species if seed from off-site is transported to Site on equipment.
- **Subsidized Predation.** The generation of waste on Site (such as household-type refuse and food scraps) could result an increase in the local abundance of certain wildlife species

that are predators to fish. Example includes piscivorous birds. This could indirectly result in a greater fish predation and mortality.

3.10.3 Avoidance and Mitigation Commitments

The proponent will commit to the following avoidances and mitigations:

- **No Work in Wetlands.** At no time will work be undertaken within the northern, eastern or western wetland complexes.
- **Sediment Control.** Site operations will be performed at 100m or greater distance from wetlands and surface water features. Should any work (e.g. access driveway maintenance) be undertaken within 30m of a wetland or watercourse, a sediment control plan will be prepared and enacted to ensure that any sediments mobilized by the activity are contained on the worksite and not allowed to enter adjacent wetted habitat. Remove temporary erosion control measures when work is complete, and areas are deemed stable. These devices can act as a barrier to wildlife and impede their movement
- **Worksite Containment.** Design and implement a plan to isolate all work thereby preventing entry of potentially deleterious materials (e.g. dust, fuel, eroded soils, etc.) to the wetland areas and surrounding habitat. The design should include the regular inspection, removal and timely disposal of materials generated.
- **Spills Prevention and Control.** The Site, once operational, will prepare and implement a Spills Prevention Plan that will reduce the potential for spills on Site and provide procedures for properly isolating, remediating and reporting spills, should they occur. See Section 3.2 for details.
- **Clean Equipment.** Equipment should be brought to Site clean. Soil and debris deposited on equipment from other sites should be washed off at an off-site location (>30m from a waterbody) prior to arrival. This will prevent the spread of invasive plant species by limiting the spread of seed.
- **Wetland Water Quantity.** This subject is addressed in Section 3.2, above.
- **Contain all refuse on Site.** All refuse generated on Site (including food scraps) will be contained such that it is not accessible to wildlife. Staff will not be allowed to feed to the local wildlife.

3.10.4 Net Impacts After Avoidance and Mitigation

The presence of fish habitat within the NEL1 Study Area is contained to the northern and southern wetland complexes. Preserving fish habitat quality includes retaining all habitat that could support fish during any critical life function which is achieved by setting back all operations 100 to 120m from all fish habitat. The only activities which will occur in vicinity to fish habitat will be vehicles and equipment utilizing the existing access driveway. The existing access driveway is not subject to the ARA permit application. If work is required on the access driveway entering the Extraction Area, it should first be assessed for nearby fish habitat by a Fisheries Specialist; DFO approval may be required and MNRF in-water timing restrictions may apply.

Quarrying is not a high-polluting activity, but operations could mobilize sediments and onsite equipment will require fuels, lubricants and other substances that could be harmful to fish and fish habitat. Site operations will be set back 100 to 120m from all wetlands and waterbodies which means the Project is at low risk of contaminating these features. None-the-less, industry standard sediment controls and spills prevention / response will ensure that deleterious substances are properly and safely stored, handled and disposed of.

Collectively, these avoidances and mitigations will safeguard fish and fish habitat and will preserve the ecological function of the fish habitat surrounding the Extraction Area for critical life functions. This will ensure that the project can proceed in a manner that is compliant with the Federal *Fisheries Act*. Compliance with the Fisheries Act *de facto* results in compliance with Section 2.1 of the PPS.

3.11 General Best Practices

The following best practices are provided to further reduce project impacts.

3.11.1 *Species at Risk*

- In the event that a Threatened or Endangered species is encountered within the proposed Extraction area, work shall be modified or halted (as required) to ensure no harm or harassment of the species. The species must be provided an opportunity to leave on its own accord. If the species cannot / will not leave, the MECP shall be contacted immediately for direction.
- With exception to active nests of migratory bird species, wildlife that are not listed as Threatened or Endangered, if encountered within the proposed development area, may be carefully removed to the nearest suitable habitat. Active nests of migratory bird species should not be removed from Site; wait until the nest is naturally vacated.

3.11.2 *Vegetation Removal*

- **Phased vegetation clearing.** Vegetation will be removed from the site on a phase-by phase basis (3 phases total). This will ensure that vegetation removal occurs incrementally over the lifespan of the Project.
- **Restore native vegetation.** Restorative plantings and seed mixes of species common to the region should be used for erosion control and rehabilitation of disturbed areas, where possible.
- **Use original Site vegetation.** Where possible, retain and reuse original vegetation and topsoil for restorative planting.

3.11.3 *Daily Operation – Best Practices*

- **Clearly define work areas.** Access and activity will be limited to the designated work areas in order to minimize disturbance to adjacent wildlife habitat. These areas will be clearly marked within the Site using fencing, stakes, flagging tape, signs etc.
- **Check work areas each day.** Snakes, turtles, birds and bat species are attracted to roadways, embankments, temporary stockpiles and machinery, as these surfaces absorb heat from the sun and can be suitable for basking, roosting or nesting. Work areas should be checked for wildlife prior to work each day.

3.11.4 *Site Equipment*

- **Good Repair.** Keep Site equipment in good working condition to reduce the potential for fluid leaks or unnecessary atmospheric emissions.

- **Clean Equipment.** Equipment should be brought to Site clean. Soil and debris deposited on equipment from other sites should be washed off at an off-site location prior to arrival. This will prevent the spread of invasive plant species by limiting the spread of seed.

4. ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to this document:

1. **The avoidances and mitigations provided within this NEL2 report are considered by Tulloch to be commitments on behalf of the Proponent.** Regulatory authorities reviewing this report will also interpret these items as commitments. The Proponent is responsible for reviewing and understanding the avoidances and mitigations contained herein and discussing these items with Tulloch if any point is found to be unclear or not feasible.
2. The Proponent is responsible for reviewing Section 1 of this document to ensure that it accurately reflects the Project. Any inaccuracies in Section 1 should be identified to Tulloch immediately upon receipt of the report.
3. It remains the responsibility of the Proponent to undertake this project in a manner that is compliant with environmental legislation. This includes the proper implementation of mitigations, such as those described in Section 3, the maintenance of these mitigations, and the monitoring of these mitigations for effectiveness. The Proponent is responsible for ensuring that the *intent* of the mitigations is achieved and for modifying or improving these mitigations if there is reason to believe they are not being effective. Contact a qualified environmental professional if assistance is required.
4. The Proponent is responsible for ensuring that information contained in this report is accurately communicated and implemented, as necessary, by persons undertaking work on the Site on the Proponent's behalf.
5. The observations, results and conclusions provided in this report represent the conditions of the Site at the times of the assessments. Habitat changes over time and species migrate with varying degrees of annual habitat fidelity.

5. SUMMARY

This NEL2 study is summarised in Table 3.

Table 3 – Summary of field studies and findings of the NEL1 report and Natural Heritage features carried forward to an NEL2 study.

Feature	NEL1 Results ¹	Carried Forward to NEL2	Impacts	Avoidances & Mitigations	Residual Effects and PPS Compliance
Significant Wetlands²	<ul style="list-style-type: none"> Large wetland complexes north, south and east of the Study Area would require OWES evaluations to determine provincial significance. In the absence of these OWES studies, these wetlands should be retained and work in vicinity should demonstrated no negative impacts. Small wetlands (<2ha) within the Study Area (G135S and G223S) are not eligible for OWES evaluation and therefore do not qualify for provincial significance. 	<p>May be Present (to be Avoided): Large wetland complexes to be retained and safeguarded.</p> <p>Confirmed Absent: Small (<2ha) wetlands are not eligible for OWES evaluation.</p>	<p>Loss of Two Small Wetlands; a total of 3.1ha (not significant habitat)</p> <p>Change in Water Levels; a low risk given that water levels are controlled by watercourses off-site.</p> <p>Surface Water Contamination; low risk given project type and setback size.</p> <p>Groundwater Contamination; low risk given project type.</p> <p>Invasive Plant Species</p>	<p>Preservation of the large northern, eastern and southern wetland complexes.</p> <p>Retention of 100-120m of riparian forest as a protective setback.</p> <p>Passive Water Management; no pumping of Site water and promotion of groundwater recharge.</p> <p>Groundwater Protection. Safeguard water quality pooled within the Site.</p> <p>Sediment Control; to prevent sediments from mobilizing into wetlands and waterbodies.</p> <p>Spills prevention and control; to handle, store and dispose of fuels etc. on Site.</p> <p>Clean equipment; to limit the spread of invasive species.</p>	<p>Loss of Two Small Wetlands; a total of 3.1ha (not significant habitat)</p> <p>Residual effects are compliant with Section 2.1 of the PPS; work adjacent potentially significant wetlands demonstrates no negative effects.</p>
Species at Risk (SAR)³: Threatened and Endangered	<p>Whip-poor-will</p> <ul style="list-style-type: none"> Whip-poor-will are confirmed present on in the Study Area. Three (3) defended territories were observed to be intersecting the Study Area; Figure 4. 	<p>Whip-poor-will</p> <p>Confirmed Present</p>	<p>Whip-poor-will</p> <p>Reduced Reproduction; clearing vegetation could stress the species.</p> <p>Subsidized Predation. The generation of waste could attract predators.</p> <p>Reduced Foraging Habitat.</p>	<p>Whip-poor-will</p> <p>Territory Avoidance; Categories 1 and 2 habitats retained.</p> <p>Forage Habitat Retained; Category 3 (Feeding) Habitat retained in wetland complexes and riparian forests.</p>	<p>Whip-poor-will</p> <p>A total of 27.7ha of Category 3 will be lost. This habitat type will remain locally abundant and the ecological function of the area to support Whip-poor-will foraging will be preserved.</p> <p>Residual effects are compliant with Sections 9 and 10 of the ESA;</p>

Feature	NEL1 Results ¹	Carried Forward to NEL2	Impacts	Avoidances & Mitigations	Residual Effects and PPS Compliance
				<p>Restricted work during the General Nesting Period; April 8 to August 28.</p> <p>Contain all refuse on Site.</p> <p>Procedures for Safe SAR Encounters and Reporting.</p>	<p>species will not be harmed, and sufficient habitat is preserved to maintain the Site's ecological function to support the species.</p> <p>ESA compliance results in compliance with Section 2.1. of the PPS.</p>
	<p>Blanding's Turtle</p> <ul style="list-style-type: none"> Blanding's Turtle wintering habitat could exist in wetlands north and south of the Study Area (Figure 4). Species presence not confirmed as these wetlands are to be retained. 	<p>Blanding's Turtle</p> <p>May be Present: Habitat is avoided.</p>	<p>Blanding's Turtle</p> <p>Road Mortality; hauling along the access driveway.</p> <p>Subsidized Predation. The generation of waste could attract predators.</p> <p>Wetland Water Quality and Quantity. This subject is addressed in Section 3.2, above.</p>	<p>Blanding's Turtle</p> <p>All (100%) of candidate Category 1 and 2 Habitats are Avoided.</p> <p>A minimum of 70m of adjacent candidate Category 3 Habitat retained.</p> <p>Wildlife Signage. "Watch for Wildlife" signs.</p> <p>Limited Vehicular Speeds. 20km/hr on the access driveway.</p> <p>Staff Education. As part of general Site orientation.</p> <p>Contain all refuse on Site.</p> <p>Procedures for Safe SAR Encounters and Reporting.</p>	<p>Blanding's Turtle</p> <p>Loss of 18.5ha of candidate Category 3 Habitat; 33% of this candidate habitat on the property.</p> <p>Residual effects are compliant with Sections 9 and 10 of the ESA; species will not be harmed, and candidate habitat is avoided.</p> <p>ESA compliance results in compliance with Section 2.1. of the PPS.</p>
	<p>Endangered Bats</p> <ul style="list-style-type: none"> The Study Area does not appear to present ideal habitat for bat maternity roosting. Foraging and day-roosting by these species are possible; especially in proximity to wetlands. No suitable hibernation habitat. 	<p>Endangered Bats</p> <p>May be Present: Species is avoided. Habitat is Retained.</p>	<p>Endangered Bats</p> <p>Mortality do to clearing vegetation.</p> <p>Loss of forage habitat. Loss of up to 28.0ha of habitat suitable for foraging and / or day-roosting.</p> <p>Day-roosting in Machinery.</p>	<p>Endangered Bats</p> <p>Forage and Day-roost Habitat Retained and abundant in wetland complexes and riparian forests.</p> <p>Restricted work during the bat active period; May 1 to September 1.</p>	<p>Endangered Bats</p> <p>Loss of forage habitat. up to 28.0ha of predominantly upland forest.</p> <p>Residual effects are compliant with Sections 9 and 10 of the ESA; species will not be harmed, and sufficient habitat is preserved to</p>

Feature	NEL1 Results ¹	Carried Forward to NEL2	Impacts	Avoidances & Mitigations	Residual Effects and PPS Compliance
				Procedures for Safe SAR Encounters and Reporting.	maintain the Site's ecological function to support the species. ESA compliance results in compliance with Section 2.1. of the PPS.
Significant Wildlife Habitat (SWH) ⁴	Turtle Habitat <ul style="list-style-type: none"> Turtle wintering habitat could exist in wetlands north and south of the Study Area. Species presence not confirmed as these wetlands are to be retained. 	Turtle Habitat May be Present: Habitat is avoided.	Turtle Habitat Road Mortality; hauling along the access driveway. Subsidized Predation. The generation of waste could attract predators. Wetland Water Quality and Quantity. This subject is addressed in Section 3.2, above.	Turtle Habitat All candidate Significant Habitats are Avoided. A minimum of 100m of adjacent upland riparian forest habitat retained. Wildlife Signage. "Watch for Wildlife" signs. Limited Vehicular Speeds. 20km/hr on the access driveway. Staff Education. As part of general Site orientation. Contain all refuse on Site. Procedures for Safe SAR Encounters and Reporting.	Turtle Habitat None. Residual effects are compliant with Section 2.1 of the PPS; work adjacent this candidate significant feature demonstrates no negative effects.
	Bat Habitat <ul style="list-style-type: none"> The Study Area does not appear to present ideal habitat for bat maternity roosting. No suitable hibernation habitat. 	Bat Habitat May be Present: Species is avoided. Habitat is Retained.	Bat Habitat Mortality do to clearing vegetation. Loss of forage habitat. Loss of up to 28.0ha of habitat suitable for foraging and / or day-roosting. Day-roosting in machinery.	Bat Habitat Forage and Day-roost Habitat Retained and abundant in wetland complexes and riparian forests. Restricted work during the bat active period; May 1 to September 1.	Bat Habitat Loss of forage habitat. up to 28.0ha of predominantly upland forest. Residual effects are compliant with Section 2.1 of the PPS; species will not be harmed, and sufficient habitat is preserved to maintain the Site's ecological function to support the species.

Feature	NEL1 Results ¹	Carried Forward to NEL2	Impacts	Avoidances & Mitigations	Residual Effects and PPS Compliance
	<p>Bird Habitat</p> <ul style="list-style-type: none"> No evidence of breeding by Special Concern birds. Waterfowl Nesting is possible in proximity to the southern wetland complex. The significance of all other candidate bird SWH in the Study Area was discounted. 	<p>Bird Habitat May be Present</p>	<p>Bird Habitat</p> <p>Loss of Nesting Habitat. Loss of up to 28.0ha of habitat suitable for nesting by migratory bird species.</p> <p>Nest Destruction; if vegetation is cleared while birds are nesting.</p> <p>Reduced Reproduction; clearing vegetation could stress the species.</p> <p>Subsidized Predation. The generation of waste could attract predators.</p>	<p>Bird Habitat</p> <p>Restricted work during the General Nesting Period; April 8 to August 28.</p> <p>Contain all refuse on Site.</p> <p>Worksite Boundaries; to be marked to contain work within authorized areas.</p> <p>Phased Vegetation Removal. Vegetation cleared incrementally over three phases.</p>	<p>Bird Habitat</p> <p>Loss of Nesting Habitat. Loss of up to 28.0ha of habitat suitable for nesting by migratory bird species.</p> <p>Large wetland complexes and 100 to 120m of upland riparian forest will be retained.</p> <p>The safeguarding of migratory birds and their active nests will ensure that this impact is compliant with the federal Migratory Birds Convention Act.</p> <p>Retaining 120m of riparian forest adjacent the southern wetland complex will ensure that ample habitat will remain for nesting by waterfowl (if present).</p> <p>No other candidate significant habitat for birds were identified within the extraction area.</p> <p>Residual effects are compliant with Section 2.1 of the PPS; species will not be harmed, and sufficient habitat is preserved to maintain the Site's ecological function.</p>
	<p>Amphibian Habitat</p> <ul style="list-style-type: none"> No significant amphibian breeding in small wetlands G134S and G223S Amphibian breeding could be significant in large wetland systems north, south and east of the Study Area. Species presence not confirmed as these wetlands are to be retained. 	<p>Amphibian Habitat May be Present: Habitat is avoided.</p>	<p>Amphibian Habitat</p> <p>Road Mortality; hauling along the access driveway.</p> <p>Subsidized Predation. The generation of waste could attract predators.</p>	<p>Amphibian Habitat</p> <p>Preservation of the large northern, eastern and southern wetland complexes.</p> <p>Retention of 100-120m of riparian forest as a protective setback.</p>	<p>Amphibian Habitat</p> <p>Residual effects are compliant with Section 2.1 of the PPS; species will not be harmed, and habitat is preserved to maintain the Site's ecological function.</p>

Feature	NEL1 Results ¹	Carried Forward to NEL2	Impacts	Avoidances & Mitigations	Residual Effects and PPS Compliance
			Wetland Water Quality and Quantity. This subject is addressed in Section 3.2, above.	Wildlife Signage. "Watch for Wildlife" signs. Limited Vehicular Speeds. 20km/hr on the access driveway. Staff Education. As part of general Site orientation. Contain all refuse on Site.	
	Cervid Habitat <ul style="list-style-type: none"> Elk movement corridor along the north side of the Site (Figure 4). Candidate moose aquatic feeding area in southern wetland complex. 	Cervid Habitat May be Present: Habitat is avoided. Elk Corridor Confirm Present Moose Aquatic Feeding Area may be present (to be avoided)	Cervid Habitat Road Mortality; hauling along the access driveway. Subsidized Predation. The generation of waste could attract predators. Habitat Avoidance; due to increased human presence.	Cervid Habitat Preservation of the large northern, wetland complex and 100m of riparian forest; results in 180-300m wide corridor retained. Preservation of the large southern wetland complex and 120m of riparian forest; includes the candidate moose aquatic feeding habitat. Wildlife Signage. "Watch for Wildlife" signs. Limited Vehicular Speeds. 20km/hr on the access driveway. Staff Education. As part of general Site orientation. Contain all refuse on Site.	Cervid Habitat Candidate Moose aquatic feeding area is avoided and left unaltered along with sufficient riparian habitat to access and egress. Elk corridor is retained but width is reduced to from 300-400m to 180-300m. Residual effects are compliant with Section 2.1 of the PPS; species will not be harmed, and aquatic feeding habitat (and access) is avoid and a corridor is retained to preserved Elk movement.

Feature	NEL1 Results ¹	Carried Forward to NEL2	Impacts	Avoidances & Mitigations	Residual Effects and PPS Compliance
Fish Habitat ⁶	Fish Habitat Fish habitat exists in the wetlands to the north and south of the Study Area, and in the ditch beside the rail right-of-way. No critical or sensitive fish habitat identified.	Fish Habitat Present: Habitat is avoided	Fish Habitat Wetland Water Quality and Quantity. This subject is addressed in Section 3.2, above. Subsidized Predation. The generation of waste could attract predators. Invasive Plant Species	Fish Habitat Setback from large northern, eastern and southern wetland complexes. Contain all refuse on Site. Proper Sedimentation Control which is removed once Project is complete. Contain Contaminants by ensuring all equipment is clean. Stockpiling and refueling away from waterbodies.	Fish Habitat None. Residual effects are compliant with the Fisheries Act and Section 2.1 of the PPS. No harm to fish or fish habitat is expected to occur as a result of this Project.

¹Searches and surveys carried forward to NEL1 field studies were selected based on the results of Site reconnaissance and habitat assessments described in the NEL1 report. Targeted studies were only conducted in instances where Site reconnaissance suggested habitat / conditions might be suitable for the species / feature to occur and where the candidate features could not be avoided by the Project.

²As defined by the Ontario Wetland Evaluation System Northern Manual (MNR 2014)

³As defined by the Endangered Species Act (ESA; S.O. 2007, c. 6)

⁴As defined by the Significant Wildlife Habitat Technical Manual (MNR 2000) and Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E (MNR 2015a).

⁵As defined by the Migratory Birds Convention Act (MBCA; S.C. 1994, c. 22)

⁶As defined by the Fisheries Act (R.S.C., 1985, c. F-14)

6. CONCLUSIONS AND CLOSING

This NEL1 report has been prepared in partial fulfillment of a licence application for Category 3 Class A Pit and Category 4 Class A Quarry licence under the ARA. It is based on preliminary Site plans produced by Tulloch Engineering and dated November 11, 2020. Tulloch Environmental has used its best professional judgment to undertake a defensible scope of study at the Site, to analyze available information accurately, and to draw reasonable conclusions based on knowledgeable and objective interpretations of those data. It is our professional conclusions that: (1) these NEL1 and NEL2 studies fully address Section 2.1 of the Provincial Policy Statement and policy number A.R.4.01.06 of the Aggregate Resources Program Policies and Procedures Manual as they related to Natural Heritage at this Site, (2) implementation of the included avoidances and mitigations (which are considered commitments on behalf of the Proponent) demonstrate that this project can proceed in a manner that is compliant with those provincial policies, (3) this NEL2 report demonstrates that the Project can proceed in a manner that is compliant with the Endangered Species Act, Fisheries Act and Migratory Birds Convention Act, and (4) the Proponent, who has retained Tulloch to undertake these studies, who has proactively incorporated the judgment of Tulloch's environmental professionals into the early stages of Project design, and who is now committing to additional avoidance and mitigations contained herein, has demonstrated their *due diligence* with respect to the planning of this Project as it relates to the aforementioned policies and Acts.

The work contained herein has been undertaken by qualified subject experts according to industry and provincial standards that are appropriate and defensible for the scope and location of this Project. If you require further information or clarification, please contact the undersigned.

TULLOCH ENVIRONMENTAL

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A handwritten signature in blue ink, appearing to read 'K. Major'.

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LITERATURE CITED

- Government of Canada. 2010. *Migratory Birds Convention Act* (MBCA). S.C. 1994, c. 22. Available from <http://laws-lois.justice.gc.ca/eng/acts/M-7.01/>
- Government of Canada. 2015. *Species at Risk Act* (SARA). S.C. 2002, c 29. Available from <http://laws-lois.justice.gc.ca/eng/acts/S-15.3/>
- Government of Ontario. 2008. *Endangered Species Act* (ESA). S.O. 2007, c. 6. Available from <https://www.ontario.ca/laws/statute/07e06>
- Harvey, M.J., J.S. Altenbach and T.L. Best. 2011. *Bats of the United States and Canada*. Johns Hopkins University Press. Baltimore, MA.
- Ontario Ministry of Municipal Affairs and Housing (MMAH). 2014. *Provincial Policy Statement under the Planning Act*. Available from <http://www.mah.gov.on.ca/AssetFactory.aspx?did=10463>
- Ontario Ministry of Natural Resources (MNR). 2000. *Significant Wildlife Habitat Technical Guide*. Ontario Ministry of Natural Resources, Ontario; Queen's Printer for Ontario, Toronto, Ontario.
- Ontario Ministry of Natural Resources (MNR). 2006. *Aggregate Resources Program Policies and Procedures Manual*. Policy number A.R.4.01.06.
- Ontario Ministry of Natural Resources (MNR). 2009. Great Lakes / St. Lawrence Region - Ecosites of Ontario Operational Working Draft of Ecosites of Ontario Field Manual. Ontario Ministry of Natural Resources.
- Ontario Ministry of Natural Resources (MNR). 2011. *Bats and Bat Habitats: Guidelines for Wind Power Projects*
- Ontario Ministry of Natural Resources (MNR). 2013. General Habitat Description for the Eastern Whip-poor-will (*Caprimulgus vociferous*). Available at http://files.ontario.ca/environment-and-energy/species-at-risk/mnr_sar_ghd_whp_pr_wll_en.pdf
- Ontario Ministry of Natural Resources (MNR). 2015a. Significant Wildlife Habitat Criteria Schedules for Ecoregion 5E.
- Ontario Ministry of Natural Resources (MNR). 2015b. *Technical Note: Species at Risk (SAR) Bats*. Regional Operations Division.
- Ontario Ministry of Natural Resources and Forestry (MNR). 2017. Blanding's Turtle General Habitat Description. Available at: [https://www.ontario.ca/page/blandings-turtle-general-habitat-description#:~:text=Suitable%20habitat%20for%20Blanding's%20Turtles,marsh%20complexes%20\(Joyal%20et%20al.](https://www.ontario.ca/page/blandings-turtle-general-habitat-description#:~:text=Suitable%20habitat%20for%20Blanding's%20Turtles,marsh%20complexes%20(Joyal%20et%20al.)
- Thorne, T.J. 2017. *Bats of Ontario*. Hawk Owl Publishing. Newcastle, ON.

Tulloch Environmental (Tulloch). 2020. Natural Environment Level 1 Study. John Rintala – Fairbank Lake Road, Whitefish.

APPENDIX A

SITE PLANS

DISTRICT OF SUDBURY
TWP OF DENISON
TOWN OF WORTHINGTON
RINTALA

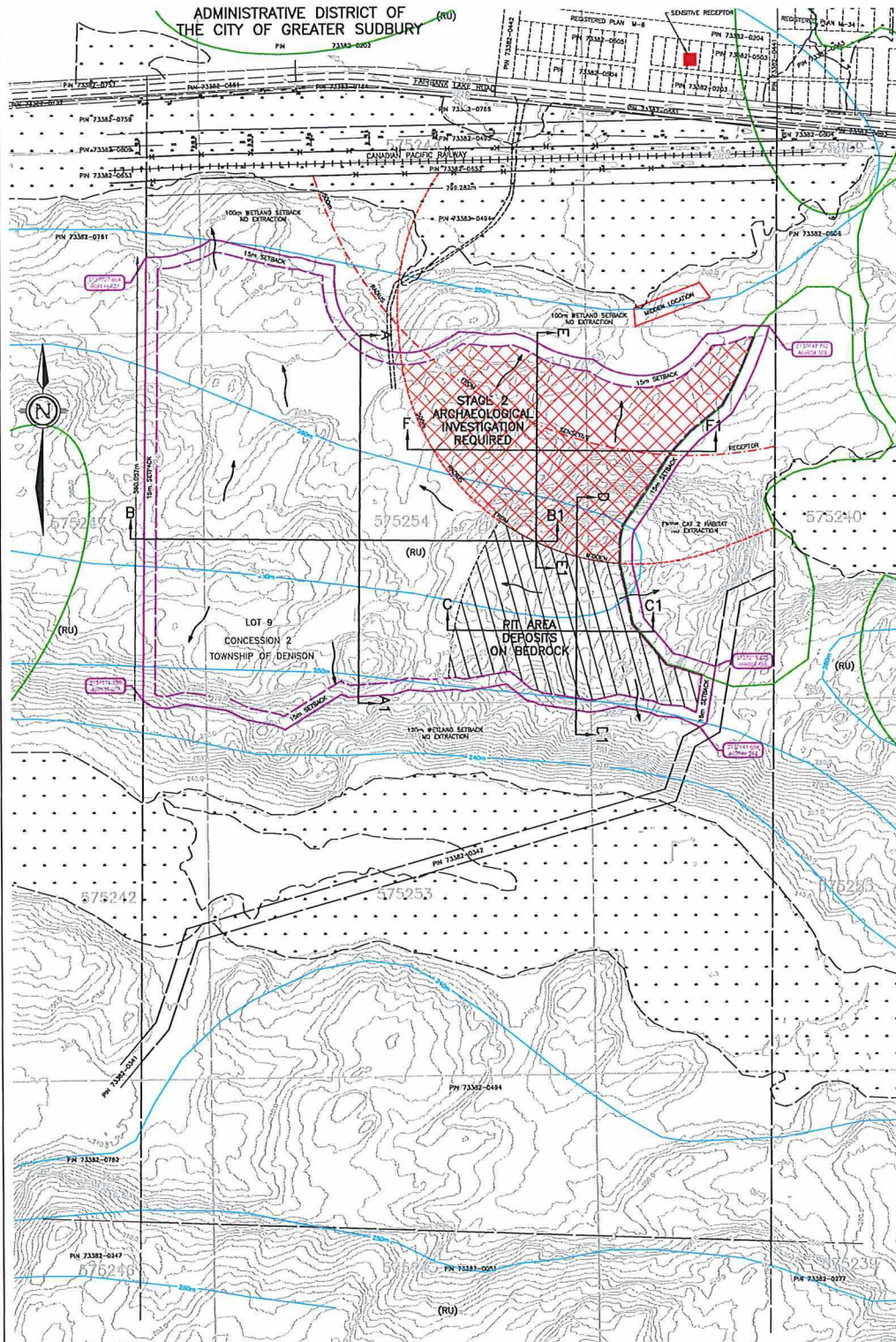
CATEGORY 3, CLASS A PIT AND
CATEGORY 4, CLASS A QUARRY
EXISTING CONDITIONS PLAN
DRAWING 1 of 5



KEY PLAN
SCALE 1 : 50,000

PRELIMINARY
NOT FOR CONSTRUCTION
NOVEMBER 11, 2020

SCALE 1:2500



LEGEND

- PROPERTY LINES
- PAVED SURFACED ROADS
- WATERCOURSES
- WETLAND ECHOITE
- EASTERN WETLAND-POOR-VELL
- LOT 2 (1/4) 1/4
- WETLAND
- CONTOURS-10m INTERNAL
- CONTOURS-2m INTERNAL
- GROUNDWATER TABLE
- EXTRACTION BOUNDARY
- 300m WETLAND OFFSET
- 100m SENSITIVE RECEPTION OFFSET
- 100m WETLAND OFFSET
- PIT AREA
- MINING CLAIM BOUNDARY
- CLAIM NUMBER
- RURAL (RU) LAND USE DESIGNATION
- SURFACE DRAINAGE

HORIZONTAL DATUM
OBSERVED REFERENCE POINTS (ORPS) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, NAD83 DATUM (2011.8).

VERTICAL DATUM
ELEVATIONS ARE GEODETIC AND ARE REFERRED TO THE CANADIAN VERTICAL DATUM OF 1928. COORDINATES ARE DERIVED FROM PRECISE POINT POSITIONING (PPP) SERVICE.

BOUNDARIES
PROPERTY BOUNDARIES ARE DERIVED FROM LAND REGISTRY OFFICE DOCUMENTATION AND RECORDS OF TULLOCH GEOMATICS INC.

APPLICANT NAME: ROAD RINTALA
ADDRESS: 2339 WELLS RD.
LIVELY, ON, P3H 1J9

ROAD RINTALA

THIS SITE PLAN IS PREPARED UNDER THE AGGREGATE RESOURCES ACT FOR A CLASS "A" LICENSE, CATEGORY 3 PIT AND CATEGORY 4 QUARRY.
THIS PLAN IS PREPARED AND CERTIFIED UNDER THE DIRECTION OF KEVIN J. JARVIS, RPP, TULLOCH ENGINEERING INC.

KEVIN J. JARVIS, RPP

AMENDMENTS TO THE SITE PLAN

AMENDMENT #1: DESCRIPTION OF THE AMENDMENT: _____
APPROVED BY: _____ DATE: _____

AMENDMENT #2: DESCRIPTION OF THE AMENDMENT: _____
APPROVED BY: _____ DATE: _____

AMENDMENT #3: DESCRIPTION OF THE AMENDMENT: _____
APPROVED BY: _____ DATE: _____

AMENDMENT #4: DESCRIPTION OF THE AMENDMENT: _____
APPROVED BY: _____ DATE: _____

RINTALA QUARRY/PIT LICENSE					
EXTRACTION	AREA (ha)	VOLUME ESTIMATE (m³)		TONNAGE ESTIMATE	
		QUARRY	PIT	QUARRY	PIT
w/o STAGE 2 ZONE	21.6	1,920,445	375,000	4,993,261	787,563
STAGE 2 ZONE	6.4	477,342	0	1,241,089	0
TOTAL (QUARRY & PIT)	28.0	2,397,827	375,000	6,234,350	787,563

NOTE: PIT AREA (3.75+ ha) OVERLAYS THE QUARRY AREA IN SOUTHWEST CORNER OF THE EXTRACTION AREA, OUTSIDE THE STAGE 2 ZONE

LICENCE SIZE = 33.8ha EXTRACTION SIZE 28ha

QUARRY NAME: RINTALA QUARRY LOCATION: 3.0km N. VIA FURBANK LAKE ROAD FROM THE
CO-ORD: E-488536, N-5137163 INTERSECTION OF HIGHWAY #17, S. SIDE OF ROAD.

SITE PLAN CATEGORY: 3 & 4 LICENCE NUMBER: ***** APPROX SCALE: 1:2500

DISTRICT: ALDENA TOWNSHIP: DENISON LOT: 9 CON: 2

SURVEY BY: TULLOCH GEOMATICS PLAN BY: TULLOCH ENGINEERING SURVEY DATE: APRIL 2020





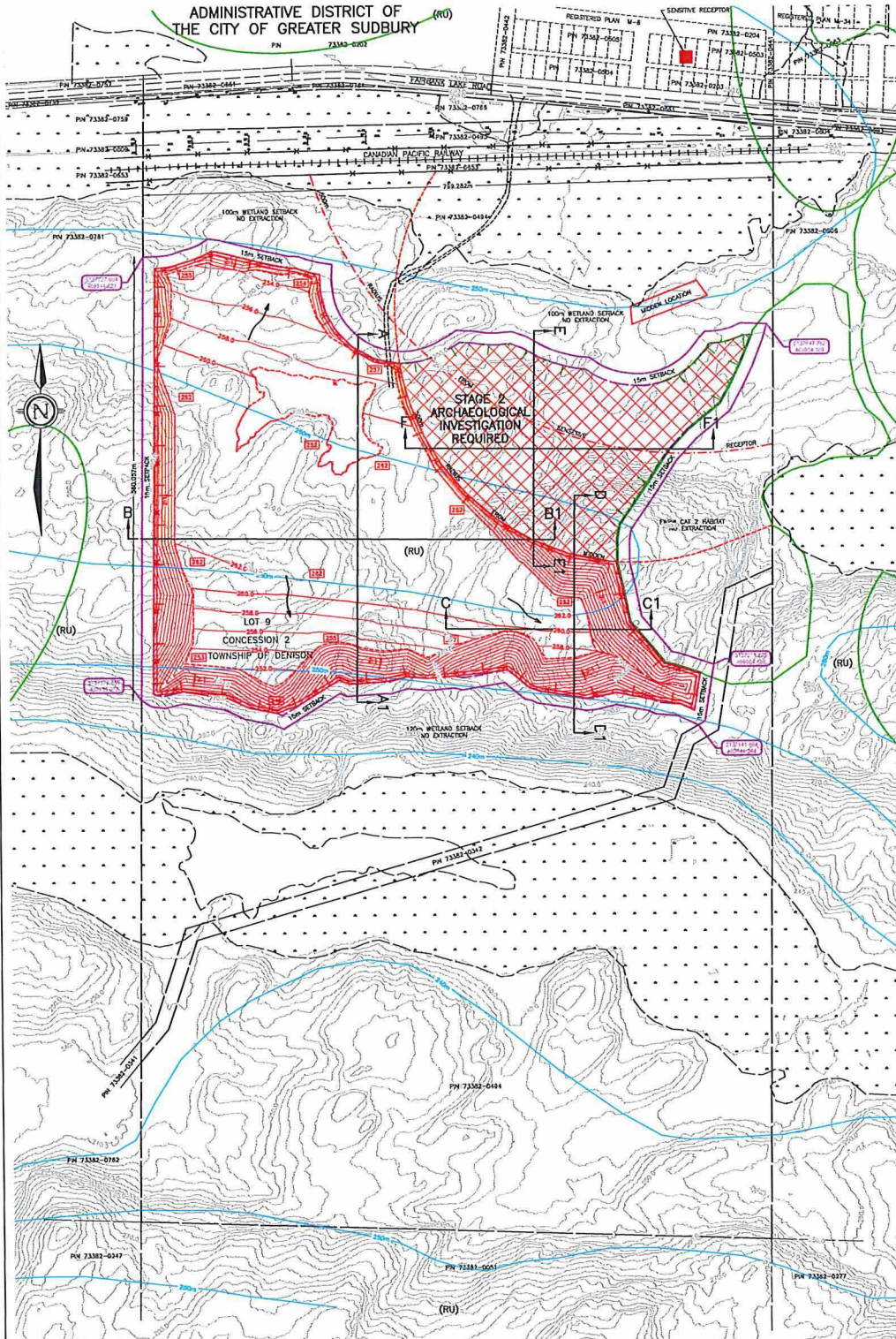
KEY PLAN
SCALE 1 : 50,000

PRELIMINARY
NOT FOR CONSTRUCTION
NOVEMBER 11, 2020

DISTRICT OF SUDBURY
TWP OF DENISON
TOWN OF WORTHINGTON
RINTALA
CATEGORY 3, CLASS A PIT AND
CATEGORY 4, CLASS A QUARRY
FINAL REHABILITATION PLAN

DRAWING 3 of 5

SCALE 1:2500



LEGEND	
	PROPERTY LINES
	GRAVEL SURFACED ROADS
	WATERCOURSES
	WETLAND ECOTONE
	EASTERN WHARF-POST-WELL CUT 2 1/2 FOOT
	RAILWAY
	CONTOURS-10m INTERNAL
	CONTOURS-2m INTERNAL
	GROUNDWATER TABLE
	LICENCE BOUNDARY
	300m BUFFER OFFSET
	800m SENSITIVE RECEPTOR OFFSET
	1200m WETLAND OFFSET
	PIT AREA
	RURAL (RU) LAND USE DESIGNATION
	FENCE LINE
	GATE
	TOP OF CUT
	BOTTOM OF CUT
	CONTOURS-10m INTERNAL
	CONTOURS-2m INTERNAL
	FINAL EXTRACTION ELEVATION
	STAGE 2 ARCHAEOLOGICAL INVESTIGATION REQUIRED
	FINAL SURFACE DRAINAGE

HORIZONTAL DATA
OBSERVED REFERENCE POINTS (ORP) DERIVED FROM GPS OBSERVATIONS USING THE PRECISE POINT POSITIONING (PPP) SERVICE, NAD83 DATUM (2011-01-01).

VERTICAL DATA
ELEVATIONS AND GEODETIC DATA ARE REFERRED TO THE CANADIAN VERTICAL DATUM OF 1985 (CVD85) AND ARE DERIVED FROM PRECISE POINT POSITIONING (PPP) SERVICE.

BOUNDARIES
PROPERTY BOUNDARIES ARE OBTAINED FROM LAND REGISTRY OFFICE DOCUMENTATION AND RECORDS OF TULLOCH GEOMATICS INC.

APPLICANT NAME: BRAND RINTALA
ADDRESS: 2339 MEANS RD.
LAKELAND, ONT. L3Y 1H8

BRAND RINTALA
THIS SITE PLAN IS PREPARED UNDER THE AGGREGATE RESOURCES ACT FOR A CLASS "A" LICENCE, CATEGORY 3 PIT AND CATEGORY 4 QUARRY.
THIS PLAN IS PREPARED AND CERTIFIED UNDER THE DIRECTION OF KEVIN JARVIS RPP, TULLOCH ENGINEERING INC.

KEVIN JARVIS, RPP

AMENDMENTS TO THE SITE PLAN

AMENDMENT #1: DESCRIPTION OF THE AMENDMENT.	DATE
APPROVED BY	
AMENDMENT #2: DESCRIPTION OF THE AMENDMENT.	DATE
APPROVED BY	
AMENDMENT #3: DESCRIPTION OF THE AMENDMENT.	DATE
APPROVED BY	
AMENDMENT #4: DESCRIPTION OF THE AMENDMENT.	DATE
APPROVED BY	

RINTALA QUARRY/PIT LICENSE							
EXTRACTION	AREA (ha)	VOLUME ESTIMATE (m³)			TONNAGE ESTIMATE		
		QUARRY	PIT	TOTAL	QUARRY	PIT	TOTAL
w/o STAGE 2 ZONE	21.6	1,920,485	375,000	2,295,515	4,993,261	787,563	5,780,824
STAGE 2 ZONE	6.4	477,342	0	477,342	1,241,089	0	1,241,089
TOTAL (QUARRY & PIT)	28.0	2,397,827	375,000	2,772,857	6,234,350	787,563	7,021,913

NOTE: PIT AREA (3.35ha) OVERLAYS THE QUARRY AREA IN SOUTHEAST CORNER OF THE EXTRACTION AREA, OUTSIDE THE STAGE 2 ZONE

LICENCE SIZE = 33.8ha EXTRACTION SIZE 28ha
QUARRY NAME: RINTALA QUARRY LOCATION: 3.9km N. VIA FARMERS LAKE ROAD FROM THE
CO-ORD: E-169538 N-5137163 INTERSECTION OF HIGHWAY #17, S. SIDE OF ROAD.
SITE PLAN CATEGORY: 3 & 4 LICENCE NUMBER: ***** APPROX SCALE: 1:2500
DISTRICT: ALDONIA TOWNSHIP: DENISON LOT: 9 CON: 2
SURVEY BY: TULLOCH GEOMATICS PLAN BY: TULLOCH ENGINEERING SURVEY DATE: APRIL 2020

TULLOCH
ENGINEERING

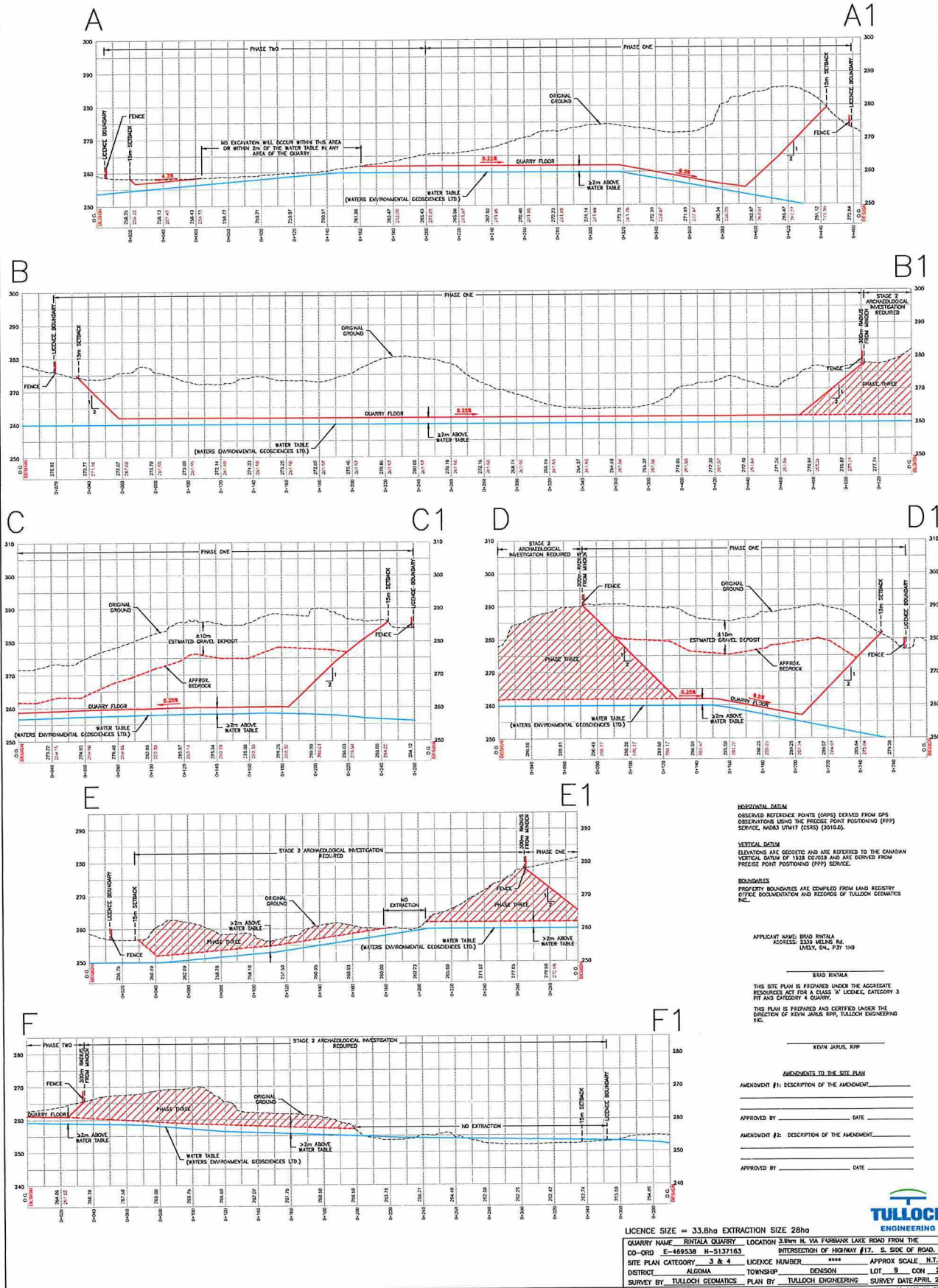
19-1433-R1-2320

HOR. SCALE 1:1000
VER. SCALE 1:500

PRELIMINARY
NOT FOR CONSTRUCTION
NOVEMBER 11, 2020

DISTRICT OF SUDBURY
TWP OF DENISON
TOWN OF WORTHINGTON
RINTALA
CATEGORY 3, CLASS A PIT AND
CATEGORY 4, CLASS A QUARRY
CROSS SECTIONS

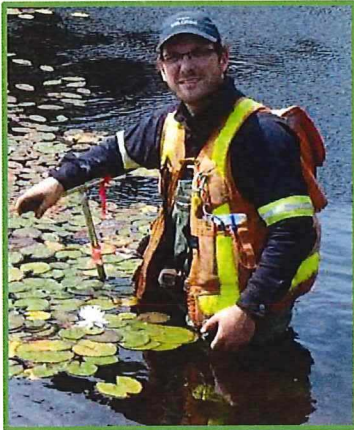
DRAWING 4 of 5



APPENDIX B

NEL2 Staff Credentials

PROJECT STAFF



Kelly Major, M.Sc. EP is a Terrestrial Ecologist at Tulloch Engineering. He has worked professionally throughout Ontario for seven years in consulting, government and academic sectors. His areas of specialization include Species at Risk, habitat assessment, wetland evaluation and biostatistics. As an academic, Kelly has acted as principal investigator for various studies in community ecology, plant invasion and silviculture. His research has been peer-reviewed and published. With the Ministry of Natural Resources and Forestry (MNRF), he surveyed wildlife biodiversity across the province and built statistical models forecasting forest succession for Boreal Ontario. As a consultant with Tulloch, Kelly leads Species at Risk surveys, wetland evaluations (Ontario

Wetland Evaluation Systems) and terrestrial habitat description (e.g. Ecological Land Classification). He performs impact assessments at sites of proposed development and prepares site specific mitigation strategies appropriate to the nature of the habitat alteration and the sensitivities present. He also serves as data analyst for Tulloch's environmental department; managing and mapping spatial data in ArcGIS and modeling quantitative data using univariate and multivariate statistical techniques.



Bill Tibble, M.Sc. is the Environmental Department Lead at Tulloch Engineering. He has worked professionally throughout Canada for 12 years as an Aquatic Biologist/Ecologist in the environmental consulting, government and academic sectors. His areas of specialization include environmental effects monitoring, environmental assessment, environmental baseline studies, and aquatic habitat characterization. He has taken part in each stage of project development, including study design, data collections and interpretation, permitting, reporting and post-construction monitoring. Bill has acted as the principle investigator for various projects requiring liaising with regulators such as Fisheries and Oceans Canada and the Ministry of Natural Resources and has

obtained the required advice, authorizations and permits for numerous projects involving in-water work.



Emelia Myles-Gonzalez, M.Sc. is an Aquatic Biologist at Tulloch Engineering. She has extensive knowledge of aquatic habitats and ecosystems. She previously worked as an aquatic biologist for 4 years in the academic sector. Emelia's focus is on aquatic habitat assessments, cause-and-effect monitoring and community composition and assessment. Emelia has played an integral role in study design, sample collection, statistical analyses, interpretation and reporting on numerous projects. Her research has been peer-reviewed and published, which she has presented at numerous international conferences. As a consultant with Tulloch, Emelia has been involved in habitat assessments, species at risk surveys, environmental monitoring and reporting.

APPENDIX C

SAR Reporting Form

APPENDIX D – Species Encounter Reporting Form

Ministry of Natural
Resources and Forestry

Ministère des Richesses
naturelles et des Forêts



Species Encounter Reporting Form

Permit Number:	MNRF District (Region):
Organization/Company Name:	
Contact Name:	
Contact Information:	

SPECIES ENCOUNTER

Name of Observer		
Date of Observation		
Location of Observation (in UTM coordinates)	Easting	Northing
Species Name		
Time of day (EST)		
Number of Individuals observed		
General Description of Observation (including the scenario under which the encounter took place)	[e.g. During corridor maintenance, our trained spotters encountered three (3) Blanding's turtles under the hydroelectric lines.]	
Actions taken to minimize/mitigate for any adverse impacts to the individual(s) (if required)	[e.g. Due to the potential for adverse impacts to the individual Blanding's turtles, we ceased activities in this area and allowed sufficient time for them to disperse. When we returned (24 hours later) to continue corridor maintenance, the turtles were no longer present.]	

Photographic documentation of Species Encounters

[SPECIES 1] Encounter

[SPECIES 2] Encounter

