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Environmental Baseline Study - Blue Mountain Facility, Township of Havelock-Belmont-Methuen, County of Peterborough, Ontario

February 11, 2022

Prepared for:
Covia Canada Ltd.

Cambium Reference: 12750-001

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Table of Contents

List of Embedded Tables

List of Appended Figures

List of Appendices

1.0 Introduction

Cambium Inc. (Cambium) was retained by [Manager] to conduct a Environmental Baseline Study - Blue Mountain Facility, Township of Havelock-Belmont-Methuen, County of Peterborough, Ontario Blue Mountain Facility (the Site: Figure 1). The Environmental Baseline Study (the Study) is being undertaken to establish an environmental baseline in advance of exploration and production activities at this location. The environmental baseline study establishes the existing conditions or reference points where future mining impacts can be evaluated against.

1.1 Terms of Reference

The Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF) was consulted by phone on August 19, 2021, to clarify the requirements for the Environmental Baseline Study. The Terms of Reference (TOR) was circulated to the NDMNRF by email on August 25, 2021. Cambium confirmed that the Study would follow the criteria outlined by Section 14 of the *Technical Standards for Reporting Assessment Work Under the Provisions of the Mining Act* (Ontario_Government, 2018). Relevant correspondence is provided in Appendix A.

1.2 Purpose and Scope of the Study

This section addresses the requirements of Section 14 (i) of the Technical Standards;

(i) state the purpose, nature, and scope of the Baseline Study.

The purpose of the Study is to document existing conditions of the Site to establish an environmental baseline in support of exploration and future production. This baseline can also be used as a reference point from which any future mining impacts can be evaluated against. A list of additional studies is recommended to expand upon this environmental baseline data set and to accurately describe the pre-exploration and pre-production conditions on Site.

This report meets the requirements under the *Mining Act* to demonstrate that sufficient work has been performed. The project scope consists of background review, fieldwork, and

technical reporting to assemble an environmental baseline for the Site. Work includes conducting Ecological Land Classification, Wetland Delineation, a summary of on-Site flora and fauna, and a habitat-based Species of Conservation Concern screening. Species at Risk (SAR) which have the potential to be encountered on the Site have been included in the Species of Conservation Concern screening.

1.3 Identification of Mining Lands

This section addresses the requirements of Section 14 (ii) of the Technical Standards;

(ii) identify the mining lands on which the study was performed, using the Township name, the cell number(s) on the Provincial Grid, as well as the claim numbers, lease numbers, Licences of Occupation numbers or Patent numbers, and identify the ownership of the land.

The Site is approximately 92 hectares of natural areas and is comprised of six contiguous mining claims, located east of the Blue Mountain Tailing Pond and extract area. Most of the Site is within the claim cells located south of Unimin Road. The only exception is that a small portion of cell 31C12L371 extends north of Unimin Road by approximately 35 metres. The Site is located within the Geographic Township of Methuen. The Site is within the municipal Township of Havelock-Belmont-Methuen (HBM) and within the County of Peterborough. Schedule A2 of HBM's official plan identifies the land use of the Site as "mineral mining and aggregate resources (Havelock-Belmont-Methuen, 2018)". Most of the Site is zoned as Open Space (OS) and the cottages are zoned as Seasonal Residential (SR). The active mining areas to the west of the Site are zoned as Extractive Industrial (M2).

The Environmental Baseline Study has been performed at the following location:

- Cell numbers: 31C12L, 31C12E
- Claim numbers: 31C12L371, 31C12L390, 31C12L391, 31C12E009, 31C12E010, 31C12E011

There are currently no surface leases or mineral leases within the Site. Likewise, there are no patents for the Site. A map showing the claim cells and the existing mine is provided in

Figure 4. Most of the Site is crown land. Small portions of the Site contain privately owned land, which includes cottages, fronting on Barrette Lake and Bottle Lake.

1.4 Accessing the Land

This section addresses the requirements of Section 14 (iii) of the Technical Standards;

(iii) identify the means of access to the land from the nearest population centre.

The Site can be access from Havelock, Ontario by travelling north on County Road 46 for approximately 30 minutes. Then travel west on Unimin Road for 650 m to arrive at the northern portion of the Site.

1.5 Site Description and Land Use

This section addresses the requirements of Section 14 (iv) of the Technical Standards;

(iv) describe the land use at the exploration project site and any previous activities on the site;

The Site occupies approximately 92 hectares within the physiographic region of Ontario known as the Georgian Bay Fringe (Putnam, 1984). The Georgian Bay Fringe is a broad belt of land characterized by very shallow soil and bare rock knobs and ridges. This physiographic region of bare rocks and shallow soils are colonized by scrubby growth of red oak, jack pine, hemlock and hardwoods. The shallow soils limit the productivity of both agriculture and forestry in this region.

The elevation of the land extends from 265 m above sea level (ASL) to 285 m ASL. The Site contains or is adjacent to (within 120 m) of the following natural heritage and hydrological features: Bottle Lake, Barrette Lake, North River, unevaluated wetlands, watercourses, woodlands, and potential habitat for Endangered and Threatened species. Most of the Site is undeveloped forest and aquatic areas composed of lake, wetland and watercourses.

Two roadways are present within the Site; Unimin Road and Fire Route 81. Trails are present within the Site boundaries. Three cottages are present on the north shore of Bottle Lake.

2.0 Applicable Natural Heritage Policy and Regulation

This section addresses the requirements of Section 14 (vii) of the Technical Standards. As noted in Section 1.0, the Study is being undertaken to establish an environmental baseline in advance of exploration and production activities at this location. The environmental baseline study establishes the existing conditions or reference points where future mining impacts can be evaluated against. While no site alteration is proposed, the following natural heritage policies and regulations are provided for future reference when an environmental impact assessment can be conducted.

2.1 Provincial Policy Statement, 2020

Section 2.1 of the Provincial Policy Statement (PPS) (Ministry of Municipal Affairs and Housing, 2020) protects the form and function of natural heritage features as defined by the PPS. Natural heritage features included in the PPS are provincially significant wetlands (PSW), significant coastal wetlands, significant woodlands, significant valleylands, significant wildlife habitat (SWH), significant areas of natural and scientific interest (ANSI), fish habitat, and the habitat of Endangered and Threatened species. Given their significance, development is prohibited within PSWs in Ecoregions 5E, 6E, and 7E and within significant coastal wetlands. Development in fish habitat and the habitat of Endangered and Threatened species shall only be permitted in accordance with provincial and federal requirements. Development within other natural heritage features and on lands adjacent to all natural heritage features are permitted only if demonstrated that there will be no negative impacts on the feature or their ecological function.

Section 2.2 of the PPS protects the quality and quantity of water, including the form and hydrologic function of sensitive surface water features and sensitive ground water features. Focus is given to maintaining hydrologic linkages and functions at the watershed scale to minimize potential negative impacts, including cross-jurisdictional and cross-watershed impacts of development. Mitigative measures and/or alternative development approaches should be considered for development near water features.

Sections 2.4 and 2.5 of the PPS provides policies related to the protection and long-term use of mineral and petroleum resources in Ontario.

2.2 Conservation Authority Regulation

“Conservation Authorities are local watershed management agencies that deliver services and programs to protect and manage impacts on water and other natural resources in partnership with all levels of government, landowners and many other organizations” (Conservation Ontario, 2021). Conservation Authorities each have their own Ontario Regulation under the *Conservation Authorities Act, 1990*. In general, they regulate development within and adjacent to river or stream valleys, Great Lakes and inland lakes shorelines, watercourses, hazardous lands (flood, erosion, unstable soils) and wetlands.

Crowe Valley Conservation Authority regulates these features under Ontario Regulation 159/06: *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*.

2.3 Endangered Species Act, 2007

Species listed as Endangered or Threatened on the Species at Risk in Ontario (SARO) list are protected under the provincial *Endangered Species Act*, 2007 (ESA) (Government of Ontario, 2007). Section 9(1) of the ESA prohibits a person from killing, harming, harassing, capturing or taking a member of a species listed as Endangered, Threatened, or extirpated. Section 10(1) of the ESA prohibits the damage or destruction of habitat of species listed as Endangered or Threatened. Protection of Special Concern species is provided through designation of their habitat as significant wildlife habitat, a provincially protected natural heritage feature.

2.4 Species at Risk Act

The federal *Species at Risk Act* (SARA) was adopted in 2002 to prevent Endangered or Threatened species from becoming extinct or extirpated, to help in the recovery of Endangered, Threatened and extirpated species, and to manage species of Special Concern to help prevent them from becoming Endangered or Threatened. Habitat which is deemed

necessary for the survival/recovery of a listed wildlife species, referred to as Critical Habitat, is protected under Section 56 of the SARA. The SARA applies to all federal lands in Canada; however, at-risk aquatic and migratory bird species located on private property in Ontario also receive protection under the Act.

2.5 Fisheries Act

Works within and adjacent to lakes, watercourses, and other bodies of water containing fish have the potential to impact fish and fish habitat. As a result of amendments to the federal Fisheries Act in 2019, projects near water that could potentially impact fish or fish habitat may require Fisheries and Oceans Canada (DFO) review. The primary purpose of the review is to determine whether harmful alteration, disruption, or destruction (HADD) of fish habitat, as defined by the Act, can be avoided. The DFO Fisheries Protection Program provides a Decision Framework and guidance material applicable to these reviews (available on-line at www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html).

3.0 Technical Approach and Data Collection Methods

This section of the report addresses the requirements of Section 14 (vi) of the Technical Standards;

(vi) describe the methods of collection of the data, the nature of the data collected and the results.

This section of the report details the method of data collection and the nature of the data. The nature of the data collected and the results are provided in Section 4.0 of this report.

3.1 Background Information Review

As part of a comprehensive desktop exercise, existing background information pertaining to the Site and surrounding landscape was compiled and reviewed to better understand local biophysical conditions. In southern Ontario, readily available data includes orthoimagery, topographic base mapping, and geological records. Natural environment and land use schedules prepared in support of Official Plans and Zoning By-Laws were reviewed to acquire municipal data. Natural area records and species occurrences were obtained from digital resources and reference materials. The comprehensive desktop review for this Site included the following resources:

- Natural Heritage Areas: Make-a-map (Ministry of Natural Resources and Forestry, 2018); Accessed March 23, 2021
- Aquatic Species at Risk Maps - Ontario (Fisheries and Oceans Canada, 2018); Accessed August 24, 2021
- Aquatic Resource Area Summary Data (Government of Ontario, 2015); Accessed August 24, 2021
- Fish ON-Line (Ministry of Natural Resources and Forestry, 2018); Accessed August 24, 2021
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature, 2018); Accessed August 24, 2021
- Ontario Breeding Birds Atlas (OBBA) (2001-2005) (Bird Studies Canada, 2005); Accessed August 24, 2021

Figure 2 shows the mapped natural heritage features present in the general area of the Site.

3.1.1 Ministry Consultation

Depending on the natural feature of the Site, ministry consultation may include the Ministry of Northern Development, Mines, Natural Resources, and Forestry (MNDMRF) or the Ministry of Environment, Conservation, and Parks (MECP), as applicable.

In early 2019, the Government of Ontario made changes to the regulating authority on matters related to SAR in the province. The Ministry of Environment, Conservation and Parks (MECP) is now responsible for administering the ESA and providing direction on potential compliance issues. MECP has prepared a guidance document titled *Client's Guide to Preliminary Screening for Species at Risk* (Ministry of the Environment, Conservation and Parks, 2019). This document aims to "help clients better understand their obligation to gather information and complete a preliminary screening for SAR before contacting the Ministry". This document was used to guide the SAR habitat-based screening for the Study.

3.2 Staff Qualifications

This section will address the requirements outlined in Section 14 (viii):

(viii) provide the qualifications of the person(s) and/or contractor(s) reporting the study

Project management was undertaken by Matthew Wheeler, Senior Ecologist/Project Manager. Keegan McKitterick (Biologist/Project Coordinator), Arlie Flynn (Technician), and Tessa Radimer (Technician) completed the field investigations. Report writing and review were undertaken by Matthew Wheeler, Tessa Radimer and Keegan McKitterick. All staff listed are employees of Cambium Inc., and their qualifications are listed in Appendix E.

3.3 Field Investigations

Information gathered through the background information review was used to guide the development of the fieldwork program. The purpose of the site visits was to verify information acquired through existing documentation and to gather additional site-specific information. The following sections provide the methods that were used to gather site-specific information.

3.3.1 Ecological Land Classification and Vegetation Inventory

The Ecological Land Classification (ELC) System for Southern Ontario (Lee, et al., 1998) was used to classify vegetation communities on the Site. Definitions of vegetation types are derived from the ELC for Southern Ontario First Approximation Field Guide (Lee, et al., 1998) and the revised 2008 tables. ELC units were initially delineated and classified by orthoimagery interpretation. Field investigations served to confirm the type and extent of communities on the Site through vegetation inventory and soil assessment with a hand auger. Where vegetation communities extend off the Site, classification is done by observing adjacent lands from within property boundaries and publically accessible lands.

3.3.2 Wetland Boundary Delineation

Wetland boundaries were initially delineated and classified by orthoimagery interpretation. The presence/absence of wetlands on the Site was confirmed through field investigations during the growing season (late May through October). Wetland boundaries were determined using the 50% wetland vegetation rule (Ministry of Natural Resources, 2014). Where vegetation-based delineation was inconclusive, soil assessment with a hand auger was used to confirm wetland boundaries. Wetland boundaries on the Site were marked with a hand-held GPS unit and staked in the field. Where wetland communities extend off the Site, classification was done through observation from property boundaries and publicly accessible lands.

3.3.3 Breeding Bird Surveys

Two (2) breeding bird surveys 7-10 days apart were carried out during the peak breeding season between May 24 and July 10. Point counts were complete using components of the Ontario Breeding Bird Atlas (OBBA) Guide for Participants (Ontario Breeding Bird Atlas, 2001) and the Forest Bird Monitoring Program (Cadman, Dewar, & Welsh, 1998) based on habitat characteristics. As outlined in the OBBA protocol, point counts are to be done between dawn and five (5) hours after dawn, when wind speed is low (<19 km/h) and in the absence of rain or thick fog. All species observations (visual and auditory) were recorded during a five (5) minute

period. Each species observed was classified and assigned a code based on the highest level of breeding evidence, as defined by the protocol: Confirmed, Probable, Possible or Observed.

3.3.4 Habitat-Based Wildlife Surveys

In addition to targeted Breeding Bird Surveys, a habitat-based approach was used to assess fauna present on-Site, consistent with standard practice. General habitat information gathered through the field investigations was used to assess the Site's connectivity with the surrounding landscape and evaluate the ecological significance of the local area. Cambium staff actively searched for features that may provide specialized habitat for wildlife. These searches included inspecting tree cavities, overturning logs, rocks and debris, scanning for scat, browse, sheds, and fur. Any evidence of breeding, forage, shelter, or nesting was noted. Species and habitat observations were documented and photographed.

4.0 Characterization of Natural Features and Functions

This section, and subsequent subheadings, will address the requirements outlined by Section 14 (v) and 14 (vi)

(v) provide a summary of the flora, fauna, and ecological communities in the area likely to be affected by the exploration project.
(vi) describe the method of collection of the data, the nature of the data collected and the results.

Background information and field investigation data are provided in the following sections. Based on the background and field data, an assessment of significance has been completed to identify natural heritage features on and adjacent to the Site.

The following field investigations were carried out on the Site and are summarized in Table 1. Representative Site photos are included in Appendix B, and specific survey locations are shown in Figure 3.

Table 1 Summary of Field Investigations

Date	Time On Site	Weather	Observer	Activities
2021-06-11	6:00am – 3:30pm	13-18°C, sunny Wind: 3	A. Flynn K. McKitterick	Ecological Land Classification Wetland Delineation Breeding Bird Survey #1 Wildlife Observations
2021-06-28	6:00am – 8:00am	22°C, slight rain Wind: 4	K. McKitterick	Breeding Bird Survey #2
2021-07-30	7:00am – 1:00pm	15-19°C, sunny Wind: 3	K. McKitterick T. Radimer	Ecological Land Classification Wetland Delineation Wildlife Observations

Notes:

Wind speed is reported as a Beaufort Wind Scale value (0 = 0-2 kph, 1 = 3-5 kph, 2 = 6-11 kph, 3= 12-19 kph, 4 = 20-30 kph, 5 = 31-39 kph, 6 = 40-50 kph)

Noise is reported based on background noise levels: Index 0 – no appreciable effect, 1 – slightly affecting sampling, 2 – moderately affecting sampling, 3 – seriously affecting sampling, 4 – profoundly affecting sampling.

4.1 Landscape Position and Topography

The Site is within the Mixedwood Plains Ecozone: Lake Simcoe Rideau Ecoregion 5E, which extends southward from a line connecting Lake Huron in the west to the Ottawa River in the

east including Ottawa, Kingston, Peterborough, Barrie, Tobermory, Kitchener, and Toronto. This ecoregion is characterized by mixed geology that includes shallow soil areas such as alvar and bedrock plains and deep soil areas such as the Oak Ridges Moraine. It falls within the Great Lakes-St. Lawrence Forest Region, including deciduous and mixed forests; however, over 50% of the landscape in this Ecoregion is currently in use as agricultural land (Lee, et al., 1998).

The Site is heavily influenced by topography and bedrock geology, and exhibits features typical of this ecoregion. It has been modified by historic glacial activity, resulting in lands occupied by a mix of open, exposed granite highlands, with sparse, shallow soils and well-developed communities of mosses and lichens, situated along steep ridges that run northeast to southwest across the subject lands. Low lying depressions in this region have accumulated deposits of sediment, organic matter and surface water which has lead to the development of several pockets of wetlands.

4.2 Vegetation Communities

The background information review identified Houghton's Flatsedge (*Cyperus houghtonii*) as being documented within the northern portion of the claim area (i.e., approximately within or north of cell 31C12L371) (Ministry of Natural Resources and Forestry, 2018). Background information indicated that the Site is primarily forested. The Site contains terrestrial and aquatic plant communities.

A total of ten (10) Vegetation communities were identified on-site during field investigations. An initial review of these communities was conducted using the most recent imagery available from the NHIC (2020). The majority of the Site is comprised of a mixed forest vegetation community (FOM2) dominated by Sugar Maple, Red Oak and White Pine. This ELC community is influenced by shallow, well-drained soils situated over top granitic bedrock. Small pockets of open rock barren vegetation communities are scattered throughout this community. Large pockets of Rock Barren vegetation communities (RBO3-1) were also mapped as separate communities. The remaining area of the Site is occupied by five (5) unique wetland communities, including shallow water wetlands (MAS3-1, SAF1-1, SAM1-1), a Black Spruce

Organic Coniferous swamp (SWC4-3), and several low-lying depressions occupied by Speckled Alder Thicket Swamps (SWT2-1).

Cultural vegetation communities were mapped, including three (3) shoreline residential properties located along the north shore of Bottle Lake and a small hunt camp located in the northern portion of the study area (18 T, 267418 m East, 4950863 m N). These areas have been mapped as CVR. A Red Pine plantation (CUP1-1) is the northern portion of the Site. ELC community (RBO3-1) is a dry-acidic open rock barren. It is characterized by long exposed cliff faces and is located within the southern portion of the study area adjacent to a large body of open water. The cliff was mostly dominated by bare unvegetated exposed rock with reindeer lichen and sparse shrubs occupying cracks and ridges along the cliff's face.

The vegetation communities on the Site are summarized in Table 2 and are mapped on Figure 3. A list of identified species and representative photos for each ELC community are provided in Appendix C.

Table 2 Vegetation Communities

No.	ELC Code	Community Description	Community Type	S -Rank
1	FOM2	Red Oak-White Pine-Sugar Maple Dry Upland Forest	Terrestrial	S5
2	CUP1-1	Red Pine Coniferous Plantation	Terrestrial	N/A
3	MAS3-3	Narrow-leaved Sedge Organic Marsh	Wetland	S5
4	SAF1-1	Waterlily—Bullhead Lily Floating-leaved Shallow Aquatic	Wetland	S5
5	SAM1-1	Pickerel-weed Submerged - Floating-leaved Shallow Aquatic	Wetland	S5
6	SWT2-1	Speckled Alder Thicket Swamp	Wetland	S5
7	SWC4-3	Black Spruce Organic Coniferous Swamp	Wetland	S5
8	RBO3-1	Dry Acidic Open Rock Barren	Terrestrial	S5
9	CLO2	Acidic Open Cliff Ecosite	Terrestrial	S3/S4
10	CVR	Residential	Terrestrial	N/A

A search for butternut (*Juglans cinerea*; provincially Endangered) was completed as part of the vegetation survey; no butternut were identified.

Houghton's Flatsedge was not observed during the field investigations. No rare plants were observed on or adjacent to the Site.

4.3 Wetland Delineation

The background information review yielded records of mapped unevaluated wetlands as isolated areas and associated with waterbodies and watercourses (Figure 1). No provincially significant wetlands (PSW) are present on or adjacent to the Site (Ministry of Natural Resources and Forestry, 2018).

The boundaries of the unevaluated wetland communities were refined and expanded based on field investigations. Several small pockets of previously unmapped wetlands were identified. Field verified wetland communities are shown on Figure 3.

A total of five (5) wetland vegetation community types were mapped, representing a mix of shallow water and shoreline marsh communities, as well as tall shrub and coniferous dominated swamps.

The boundary of these wetlands was heavily influenced by topography and bedrock geology, with many of the low-lying regions of the Site being occupied by these wetland communities. Wetland boundaries adjacent to open water were mapped using the 2 m water depth mark where observable, as well as the extent of emergent wetland vegetation.

Wetland boundaries were delineated using a combination of orthoimage interpretation and ground-truthed using hand-held GPS.

4.4 Fish and Aquatic Habitat

Bottle Lake is listed as warmwater fish habitat. Background information from Land Inventory Ontario did not contain fish species data for Bottle Lake or any other waterbody or wetland on Site (Ministry of Natural Resources and Forestry, 2018).

No Critical Habitat for aquatic species at risk listed under SARA was identified in Bottle Lake, Barrette Lake, North River or adjacent to the Site (Fisheries and Oceans Canada, 2018).

4.5 Wildlife Survey Results

Background information included records for the following natural heritage features on and adjacent to the Site: A Colonial Waterbird Nesting Area (i.e., wildlife concentration area). The Colonial Waterbird Nesting Area is present across most of the Site, including part of the following claim cells; 31C12E009, 31C12E010, 31C12E011, and 31C12L371. Background information included a record of a Mixed Wader Nesting Colony (i.e., a wildlife concentration area) which extends across part of the following cells: 31C12E011 and 31C12L391.

The Ontario Reptile and Amphibian Atlas records the following species as present within the 100 km^2 landscape, including and surrounding the Site:

- Snakes
  - Eastern Gartersnake (*Thamnophis sirtalis sirtalis*)
  - Eastern Hog-nosed Snake (*Heterodon platirhinos*)
  - Eastern Ribbonsnake (*Thamnophis sauritus*)
  - Milksnake (*Lampropeltis triangulum*)
  - Northern Watersnake (*Nerodia sipedon sipedon*)
  - Red-bellied Snake (*Storeria occipitomaculata*)
  - Northern Ring-necked Snake (*Diadophis punctatus*)
  - Smooth Greensnake (*Opheodrys vernalis*)
- Turtles
  - Blanding's Turtle (*Emydoidea blandingii)*
  - Midland Painted Turtle (*Chrysemys picta marginata)*
  - Snapping Turtle (*Chelydra serpentina*)
- Frogs and Toads
  - American Bullfrog (*Lithobates catesbeianus*)
  - Gray Treefrog (*Hyla versicolor*)

- Green Frog (*Lithobates clamitans*)
- Mink Frog (*Lithobates septentrionalis*)
- Northern Leopard Frog (*Lithobates pipiens*)
- Pickerel Frog (*Lithobates palustris*)
- Spring Peeper (*Pseudacris crucifer*)
- Western Chorus Frog (*Pseudacris triseriata*)
- Wood Frog (*Lithobates sylvaticus*)
- American Toad (*Anaxyrus americanus*)
- Salamanders
- Red-spotted Newt (*Notophthalmus viridescens viridescens*)
- Eastern Red-backed Salamander (*Plethodon cinereus*)

- Lizards
  - Five-lined Skink (*Plestiodon fasciatus*)

Incidental wildlife observations were recorded during site visits. Incidental wildlife observations of amphibians and reptiles included Green Frog, Wood Frog, and Western Chorus Frog.

4.5.1 Birds

OBBA breeding bird surveys were completed as a part of the current study, as detailed in Appendix E. Bird species observed on or adjacent to the Site, breeding evidence, federal and provincial status and s-ranks are provided in Appendix E. A total of seventeen (17) bird species had probable or confirmed breeding evidence (shaded cells in Appendix E). Species with probable or confirmed breeding evidence observed during the field investigation included:

- American Robin
- Black-and-white Warbler
- Black-throated Blue Warbler
- Black-throated Green Warbler
- Blue Jay
- Common Grackle

- Common Loon
- Common Yellowthroat
- Chestnut-sided Warbler
- Eastern Phoebe
- House Wren
- Ovenbird
- Pine Warbler
- Red-eyed Vireo
- Red-winged Blackbird
- Veery
- White-breasted Nuthatch
- Wood Thrush

Details on species of conservation concern, including species at risk (SAR), and their protected habitat, is provided under Section 4.6.

Incidental bird observations were documented outside of targeted breeding bird surveys. The following bird species were recorded as incidental observations outside of targeted breeding bird surveys; Red-breasted Nuthatch (*Sitta canadensis)*, Downy Woodpecker (*Dryobates pubescens*), Pileated Woodpecker (*Dryocopus pileatus*), Common Tern (*Sterna hirundo*), and Turkey Vulture (*Cathartes aura*).

4.5.2 Other Wildlife

Other wildlife observed during Site investigations included evidence (scat) from white-tailed deer and eastern coyote.

4.6 Species of Conservation Concern

A list of species of conservation concern, including species at risk, with the potential to occur in the general vicinity of the Site, has been compiled based on known species' ranges, habitat requirements, and review of background information sources (as listed in Section 3.1). In

addition, the list has been augmented with direct field observations from the current study, as detailed in the previous sections. Cambium has employed a habitat-based screening, supplemented with targeted field surveys when necessary, to identify suitable habitat for species located on or adjacent to the Site. A detailed habitat suitability analysis is provided in Appendix F, and a discussion of the results is provided below.

4.6.1 Endangered and Threatened Species

The Least Bittern is listed as a Threatened species federally and provincially. It is a small member of the heron family, only reaching 30 cm in length. It occupies many wetland habitat types but strongly prefers cattail marshes with a mix of open pools and channels during its breeding phase of life (Ministry of Natural Resources, 2014). Many of the wetlands on the Site contain suitable habitat elements for Least Bittern foraging and possibly breeding. Evening marsh bird nesting surveys were not completed as a part of this study. As such, the Least Bittern was not observed on the Site.

Background information contains a record for Eastern Whip-poor-will on or adjacent to the Site (Ministry of Natural Resources and Forestry, 2018). The Eastern Whip-poor-will is Threatened both federally and provincially. It uses habitats with a mix of open and forested areas, and its breeding is dependent on forest structure being semi-open or with patchy clearings such as found in ELC communities 1 and 8. This Site is dominated by mixed forest with small open rock barren communities. Small openings have been included in ELC community 1, with larger openings mapped separately (as ELC community 8). Nocturnal surveys for this species were not conducted as a part of this study, and as such, Eastern Whip-poor-wills were not observed during field visits. However, the mixture of forested habitats, clearings and proximity to water makes the Site suitable for the life processes of this species.

Blanding’s Turtle, a provincially and federally Threatened species, is present in the vicinity of Covia’s Blue Mountain Mine. Covia undertakes stewardship initiatives to collect Blanding’s Turtle eggs that have been laid on their roadways. The eggs are incubated in captivity, and hatchling turtles are released back to their wetland habitats. These proactive measures greatly assist with the recovery of Threatened species like Blanding’s Turtles that have long lives.

Background information contains an element occurrence record for the species near claim cell 31C12E011 (i.e. in or near Bottle Lake) and north of Unimin Road on adjacent lands (Ministry of Natural Resources and Forestry, 2018).

Blanding's Turtles spend most of their life cycle in large wetlands or shallow lakes with high densities of water plants, nutrient-rich water, and organic sediment such as found in ELC communities 3, 4, 5, and 6. These communities represent a mix of suitable shallow water wetlands that provide vegetation cover and basking opportunities for turtles. Additionally, the adjacent open water communities, including Bottle Lake, provide additional habitat. Adjacent lands contain a similar mix of vegetation communities as the study area, additionally a small sedge-dominated fen community is located at the south end of Bottle Lake which may provide a unique wetland habitat not observed elsewhere on the Site. They use fields, roadways, open areas, dry coniferous and mixed forest habitats for nesting such as ELC community 1. Blanding's Turtles were not observed during field visits but are known to be present in the area.

The Western Chorus Frog is small, with a dark stripe running through its eye and a light stripe underneath. This species is listed as Threatened federally and is not listed as a species at risk provincially. It is primarily a lowland terrestrial species that require access to terrestrial and aquatic habitats near one another. Relying on marshes and wooded wetlands adjacent to forested habitats, this species also requires isolated, predator-free pools for breeding. Temporary pools, such as vernal pools in wooded areas, are preferred. This species hibernates terrestrially in various environments, including leaf litter, wood debris, and vacant animal burrows. This combination of terrestrial and aquatic habitat and the presence of woodland or vernal pools was observed on Site. Habitat for this species is provided in combination by ELC communities 1, 3, 4, 5, 6, and 7. Western Chorus Frog was heard as an incidental observation in ELC communities 3 and 4 during the first site visit in June.

The Eastern Hog-nosed Snake can be a variety of colours and patterns, so its flattened, upturned nose most easily identifies it. They prefer sandy, well-drained habitats such as beaches and dry forests, like those found in ELC community 1. They utilize dry sandy areas to lay their eggs, hibernate and burrow in these areas. The main diet of this snake is toads and

frogs, so they usually stay close to water, including marshes and swamps, including ELC community 3, 4, 5, 6, and 7, where they have an increased chance of finding their preferred prey. Eastern Hog-nosed Snakes are exceptionally difficult to find during visual encounter surveys (VES). Targeted surveys for this species are unlikely to confirm species absence (Ministry of Natural Resources and Forestry, 2016).

Based on the size and contiguous nature of the forest community (ELC community 1) as well as the proximity to water and feeding areas (ELC community 3, 4, 5, and 6) make this site likely to contain habitat for several species of bats including Tri-colored Bat, Eastern Small-footed Myotis, Little Brown Myotis, and Northern Myotis. Nocturnal acoustic surveys for bats were not completed during the field investigations. Bats were not observed during field visits; however, several cavity trees were observed throughout ELC community 1.

The Algonquin Wolf, listed as a Threatened species provincially, is known to be present in the region (Ministry of Natural Resources, 2014). This species is most prevalent in areas with abundant prey such as beaver, white-tailed deer, and moose. Algonquin Wolf may be found on the Site and adjacent lands.

As noted in Section 4.4, no Critical Habitat for aquatic species at risk listed under SARA was identified in Bottle Lake, Barrette Lake, or North River on or adjacent to the Site (Fisheries and Oceans Canada, 2018).

4.6.2 Special Concern Species

The Common Nighthawk is provincially listed as Special Concern species. It uses habitats with a mix of open and forested areas, and its breeding is dependent on forest structure being semi-open or with patchy clearings such as found in ELC communities 1 and 8. This habitat is dominated by mixed forests with small open rock barren communities. Small openings have been included in ELC community 1, with larger openings mapped separately (as ELC community 8). Nocturnal surveys were not completed for Common Nighthawk, and it was not observed during field investigations.

The Canada Warbler uses many forest types as habitat, such as ELC community 1 on and adjacent to the Site. Mossy downed woody debris was present in this community and is suitable for this species preference for nesting on the ground. No Canada Warblers were observed during field visits.

The Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests with little understorey vegetation, as available in ELC community 1 on/adjacent to the Site. Eastern Wood-pewee was observed during field visits both incidentally as well as during the second Breeding Bird visit.

Wood Thrush uses deciduous and mixed forests with moist stands of trees, moderate understories, shade, and abundant leaf litter, as can be found in some areas of ELC community 1, particularly adjacent to ELC community 7 and 8, in lower-lying areas where forest soil moisture is relatively higher. A nesting Wood Thrush with a clutch of eggs was observed during Site visits in the southwestern portion of the Site, east of the tailings area at the Blue Mountain Mine facility (Figure 3).

Background information yields a record of Midland Painted Turtle on the northern portion of the Site or on adjacent lands (Ministry of Natural Resources and Forestry, 2018). The Midland Painted Turtle uses waterbodies such as ponds, marshes, lakes, and slow-moving creeks with a soft-bottom and aquatic vegetation as its habitat. ELC communities 3, 4, 5 and 6 on-site and adjacent to the Site provide suitable habitat for the species. No Midland Painted Turtles were observed during site visits.

Background information yields a record of Snapping Turtle on the northern portion of the Site (Ministry of Natural Resources and Forestry, 2018). The Snapping Turtle is found in shallow water with soft mud and leaf litter but travels to gravel or sandy embankments/beaches to lay eggs. ELC communities 3, 4, 5 and 6 provided this type of aquatic habitat with small pockets of open water interspersed with vegetation, and basking habitat along the shoreline provides suitable habitat. No Snapping Turtles were observed during site visits.

The Yellow-banded Bumble Bee is a habitat generalist and could use flowering species from various ELC communities present on Site, including ELC communities 1, 3, 4, 5, 6, 7 and 8. No Yellow-banded Bumble Bees were observed during site visits.

The Black Tern is a small waterbird with a forked tail, straight pointed bill, slender shape, and black head during the breeding season. It builds floating nests in loose colonies in shallow marshes, with a preference for cattails. They breed primarily in the marshes along the edges of the Great Lakes but may also use wetlands further north if suitable. ELC communities 3 and 4 provided suitable habitats for this species, including densely vegetated areas and large open water areas for feeding. No Black Terns were observed during field visits.

The Common Five-lined Skink is Ontario's only lizard species. Its Southern Shield population can be found underneath rocks on open bedrock in forests and bask on sunny rocks and logs. They hibernate in crevices among rocks or buried in the soil. They hibernate in groups under rocks and tree stumps or in rotting wood. ELC communities 1 and 8 provide suitable habitats for this species. No Five-lined Skinks were observed during field Visits.

Eastern Ribbonsnake is listed as a Special Concern species provincially. This species is usually found close to water, especially in marshes and other wetlands where it hunts for frogs and small fish (Ministry of Natural Resources, 2014). It is a good swimmer and can utilize aquatic and terrestrial environments. This snake hibernates in underground burrows and rock crevices below the frost line. This species was not observed on Site during the field investigations.

5.0 Environmental Quality Standards and Impact Assessment

This section will address requirements of Section 14 (vii);

(vii) describe the Environmental Quality Standards used to assess the environmental impact on the study area.

The Environmental Baseline Study (the Study) is being undertaken to establish an environmental baseline in advance of exploration and production activities at this location. The environmental baseline study establishes the existing conditions or reference point where future mining impacts can be evaluated against.

There is no proposed site alteration or development, and this existing conditions report does not provide an impact assessment. Likewise, environmental quality standards are not applied as this report is not reviewing individual substances or their impact on the environment. As there are currently no plans for development or extraction, environmental impacts will be assessed once a production area has been established.

6.0 Recommendations for Future Environmental Baseline Studies

This section of the study provides recommendations for future fieldwork that can be undertaken to further understand the environmental baseline conditions at the Site. The following work can be considered

6.1 Fisheries

Fisheries surveys should be completed to define the fish communities present within the wetlands, watercourses and waterbodies on the Site. The goal of initial fisheries surveys is to understand the fish species present on the Site and to map their habitats. Data collection might include the following activities;

1. Survey residents on Bottle Lake and surrounding lakes to understand recreational fish present.
2. Conduct preliminary fisheries investigations including;
    a. Electrofishing surveys
    b. Beach seine net surveys
    c. Hoop net, Fyke Nets and Trap Nets
    d. Gee or minnow traps
    e. Underwater Observation (i.e., snorkelling surveys)

6.2 Reptiles and Amphibians

Marsh Monitoring Protocol can be used to determine which amphibian species are present and breeding in wetlands on the Site (Bird Studies Canada, 2008). Amphibian surveys involve completing three (3) surveys to collect data at different times of the year when different amphibians will be calling:

- Survey #1: April 15-30
- Survey #2: May 15-30
- Survey #3 June 15-30

Targeted surveys can be completed using the survey protocol for Blanding's Turtle. This survey protocol provides a standardized, science-based approach for conducting field surveys for Blanding's Turtles in Ontario. This survey methodology applies Visual Encounter Survey methods. The survey methodology can be applied to collect observations of other turtle species such as Midland Painted Turtle and Snapping Turtles. The survey is best performed immediately in the spring after the ice cover recedes from wetlands and can continue until mid-to-late June when Blanding's Turtles bask less frequently. Surveys can be carried out from 8 am to 5 pm during sunny periods when the air temperature is warmer than the water temperature and is above 5°C (Ministry of Natural Resources and Forestry, 2015). This survey requires 5 to 10 intense surveys carried out across approximately 3 weeks. However, no additional surveys are required if the species is observed because their presence has been confirmed.

A supplemental survey that could be completed concurrently with the turtle survey is a snake and salamander survey. This supplement survey could be done by placing artificial cover objects (ACO), such as a piece of untreated plywood, down in areas the biologists would frequent during turtle surveys. The ACO could be checked at each site visit to determine if snakes or salamanders are using the area.

As was previously noted, visual encounter surveys are not recommended for Eastern Hog-nosed Snakes because they usually occur at low densities, and the probability of encountering the species is exceptionally low. A more cost-effective method to obtain more information about the species would be to interview Covia employees that are familiar with the property and cottagers or residents. Photographs of Eastern Hog-nosed Snake and other snake species could be shown to interviewees to determine which species they have observed.

6.3 Birds

Annual bird surveys could be completed at the monitoring points established during this baseline study. Annual bird surveys would provide a longer-term data set of the species utilizing the Site. Targeted evening surveys could be completed in wetland areas for marsh

birds, including Least Bittern and Black Tern. Additional monitoring locations could be established depending on the portion of the property where additional data is required.

As a supplemental source of information, passive acoustic recording devices can be set up to record bird calls, and software can be used to identify the species observed within the data set. This allows for a more robust data set to be collected should more intensive studies be needed for impact assessment requirements.

Surveys for Eastern Whip-poor-will and Common Nighthawk can occur starting 30 minutes before sunset and continue until 3 hours after sunset. Generally, the core survey period is from June 15 to July 15 (Ministry of Natural Resources and Forestry, 2013). However, the surveys can extend before or after these calendar dates based on moon phases.

6.4 Bats

Nocturnal surveys can be completed in areas of interest to establish which bat species are utilizing the property. Passive or active acoustic monitoring devices can be utilized to record bat calls, and software can be applied to identify bat species. The active period for bats in southern Ontario is April 1 – September 30. Surveys should be shifted to the earlier part of the active season to collect data regarding roosting and maternity habitats (Ontario Ministry of Natural Resources, 2011).

6.5 Large Wildlife

Trail cameras could be set up in strategic places such as wildlife trails, beaver dams and other habitat elements to determine if wolves or other large wildlife are present on the Site. Sandy or muddy areas can also be used to obtain track information for various wildlife species.

6.6 Botanical Surveys

Additional biological surveys could be completed during the spring, summer and fall to capture a wider range of vascular and non-vascular plants present at the Site. Areas that contain rare plants or unique ecosystems can be identified through multi-season surveys. This activity would also benefit the mine as it could identify ecological assets that could be used for mine

closure activities. For example, areas to be cleared could be reviewed for any plant materials (i.e., seeds, cuttings, spores, young plants, mosses) that could be salvaged and used for mine reclamation activities. Many native species are of great utility for mine reclamation as they have adapted to local climatic conditions. Some native plants have exceptionally deep root systems and are better able to colonize reclamation areas than traditional agronomic grasses and forbs. Likewise, native soils contain a diversity of organisms, including fungi and bacteria, that can assist with mine re-vegetation efforts and expedite ecosystem development. Detailed botanical surveys will add value by making a more robust data set for the environmental baseline conditions and identifying ecological assets that can be used for reclamation activities.

7.0 Closing

In closing, this report establishes an environmental baseline study for the Site. This study meets the criteria outlined by Section 14 of the *Technical Standards for Reporting Assessment Work Under the Provisions of the Mining Act* (Ontario_Government, 2018). This study documents the Site's existing conditions and establishes an environmental baseline in support of exploration and future production. This baseline can also be used as a reference point from which any future mining impacts can be evaluated against.

Respectfully submitted,

Cambium Inc.

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Technician

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9.0 Glossary of Terms

ANSI: Area of Natural and Scientific Interest
ARA: Aquatic Resources Area
ARA: Aggregate Resources Act
AS: Agricultural System
ATK: Aboriginal Traditional Knowledge
BMA: Bear Management Area
BMP: Best Management Practice
CA: Conservation Authority
CEAA: Canadian Environmental Assessment Act/Agency
CFA: Canadian Forestry Association
CFIP: Community Fisheries Involvement Program
CFS: Canadian Forestry Service
CHU: Critical Habitat Unit
CH: Cultural Heritage
CLI: Canada Land Inventory
CLU: Crown Land Use
COSSARO: Committee on the Status of Species at Risk in Ontario
CR: Conservation Reserve
CWIP: Community Wildlife Involvement Program
CWS: Canadian Wildlife Service
DFO: Fisheries and Oceans Canada
EA: Environmental Assessment
EAA: Environmental Assessment Act
EAB: Emerald Ash Borer
EBR: Environmental Bill of Rights
EIA: Environmental Impact Assessment
EIS: Environmental Impact Study/Statement
ELC: Ecological Land Classification System
ELUP: Ecological Land Use Plan
END: Endangered species
EPA: Environmental Protection Act
ER: Environmental Registry
ESA: Endangered Species Act (2007)
ESA: Environmentally Sensitive Area
ESC: Erosion and Sediment Control
GIS: Geographic Information System
GLSL: Great Lakes – St. Lawrence
GPGGH: Growth Plan for the Greater Golden Horseshoe
GPS: Global Positioning System
HSA: Habitat Suitability Analysis
HIS: Habitat Suitability Index
KHA: Key Hydrologic Areas
KHF: Key Hydrologic Features
KNHF: Key Natural Heritage Features
LCFSP: Licence to Collect Fish for Scientific Purposes
LIO: Land Information Ontario
LRIA: Lake and Rivers Improvement Act
LUP: Land Use Permit or Plan
MA: Management Area
MAFA: Moose Aquatic Feeding Area
MCEA: Municipal Class Environmental Assessment
MECP: Ontario Ministry of Environment, Conservation and Parks
MNDMRF: Ontario Ministry of Natural Resources and Forestry
NER: Natural Environment Report
NHIC: Natural Heritage Information Centre
NHIS: Natural Heritage Information System
NHS: Natural Heritage System
OBM: Ontario Base Map
OFIS: Ontario Fisheries Information System
OLI: Ontario Land Inventory
OMAFRA: Ontario Ministry of Agriculture, Food and Rural Affairs
OWES: Ontario Wetland Evaluation System
PPS: Provincial Policy Statement (2014)
PSW: Provincially Significant Wetland
RLUP: Regional Land Use Plan
RMP: Regional Management Plan
R.P.F.: Registered Professional Forester
SAR: Species at Risk
SARO: Species at Risk in Ontario
SC: Special Concern species

F&W: Fish and Wildlife
FA: Fisheries Act (Federal)
FEC: Forest Ecosystem Classification
FMP: Forest Management Plan
FRI: Forest Resources Inventory
FWCA: Fish and Wildlife Conservation Act
GGH: Greater Golden Horseshoe
GHP: General Habitat Protection
SWH: Significant Wildlife Habitat
SWM: Stormwater Management
THR: Threatened species
TOR: Terms of Reference
TPP: Tree Preservation Plan
WIA: Woodlands Improvement Act
WMU: Wildlife Management Unit

10.0 Standard Limitations

Limited Warranty

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Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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Appended Figures

ENVIRONMENTAL BASELINE STUDY

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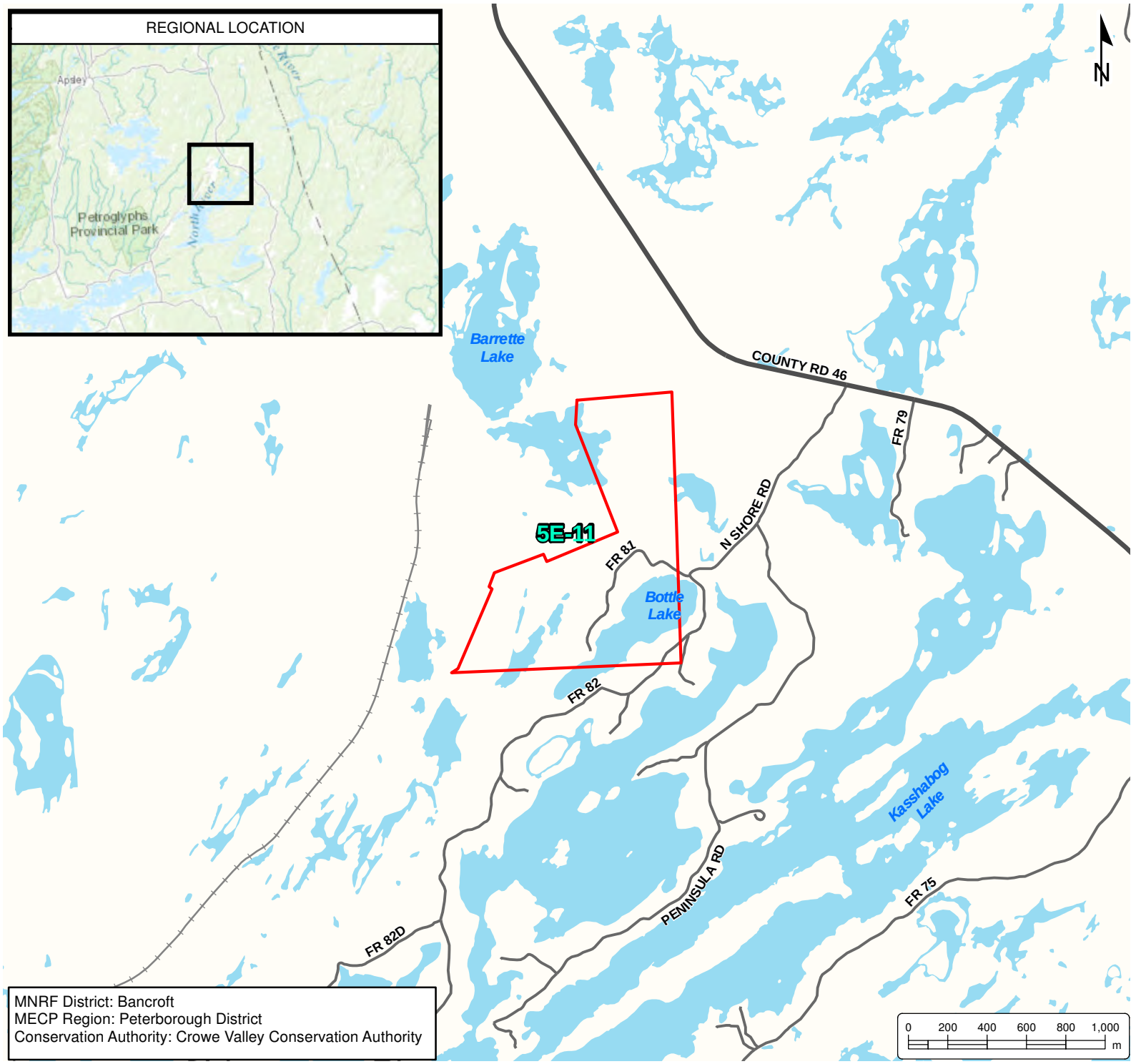
Nepheline Syenite Operation,
Havelock, Ontario

REGIONAL LOCATION



MNRF District: Bancroft
MECP Region: Peterborough District
Conservation Authority: Crowe Valley Conservation Authority

0 200 400 600 800 1,000 m

LEGEND

- Major Road
- Minor Road
- Railroad
- Water Area
- Ecodistrict
- Site (90.8 ha) (approximate)

Notes:
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources and Forestry or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
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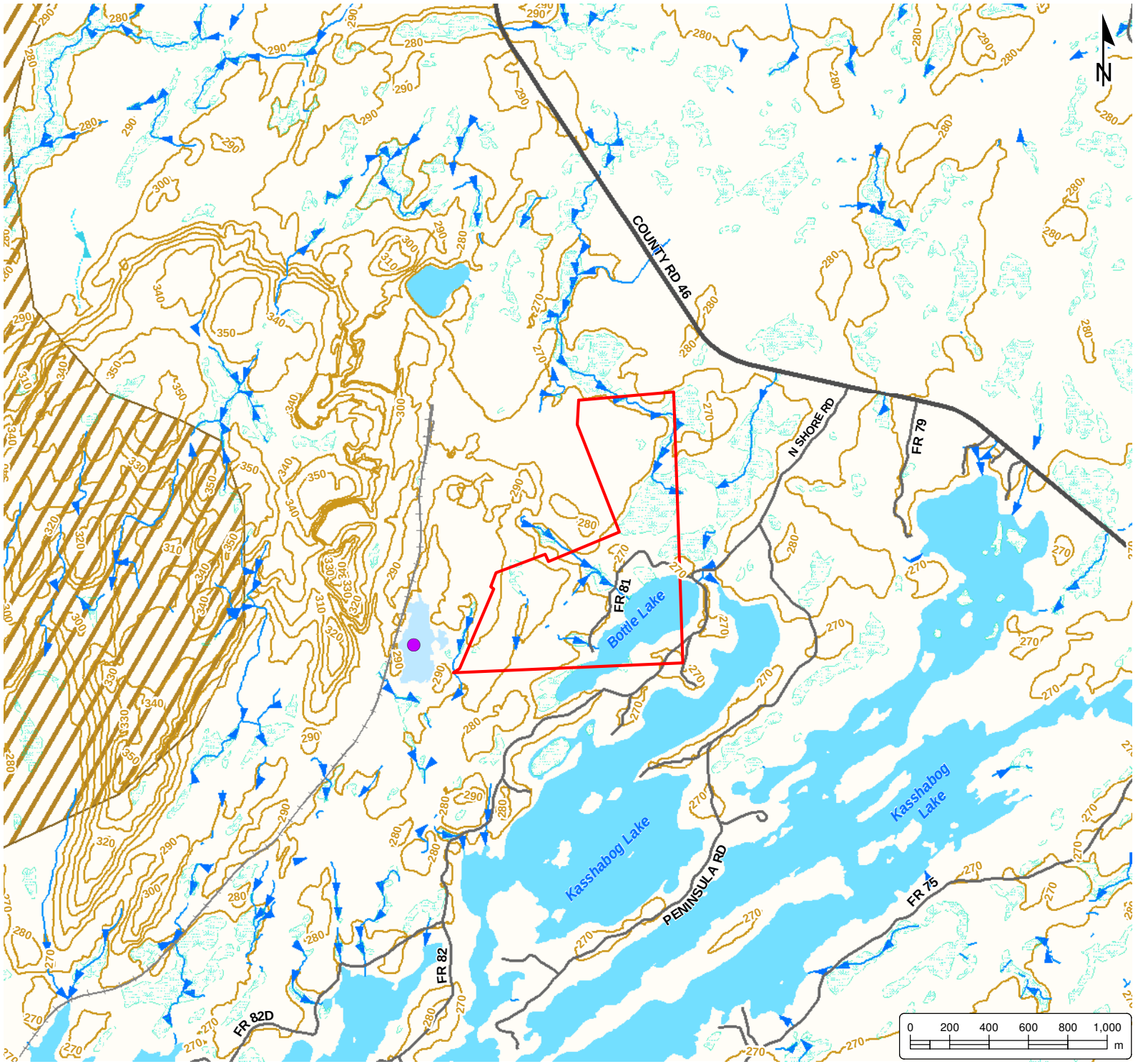
SITE LOCATION AND SPECIAL PLANNING AREAS

Project No.: 12750-001		Date: October 2021	Rev.:
Scale: 1:27,500		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: MW	Figure: 1	

O:\GIS\MXDs\12700-12799\12750-001 Covia Corp - Covia Lease Expansion - Natural Heritage Baseline Study\2021-09-16 FIG 1 - Site Location and Special Planning Areas.mxd



ENVIRONMENTAL BASELINE STUDY

COVIA CANADA LTD.
Nepheline Syenite Operation,
Havelock, Ontario

LEGEND

- Aquatic Resources Survey Point
- Major Road
- Minor Road
- Railroad
- Watercourse, Intermittent
- Watercourse, Permanent
- Contour 10m Interval (Major)
- Contour 10m Interval (Minor)
- Unevaluated Wetlands
- Deer Wintering Area (Stratum 1)
- Waterbody - Unknown Thermal Regime
- Waterbody - Warm
- Site (90.8 ha) (approximate)

Notes:
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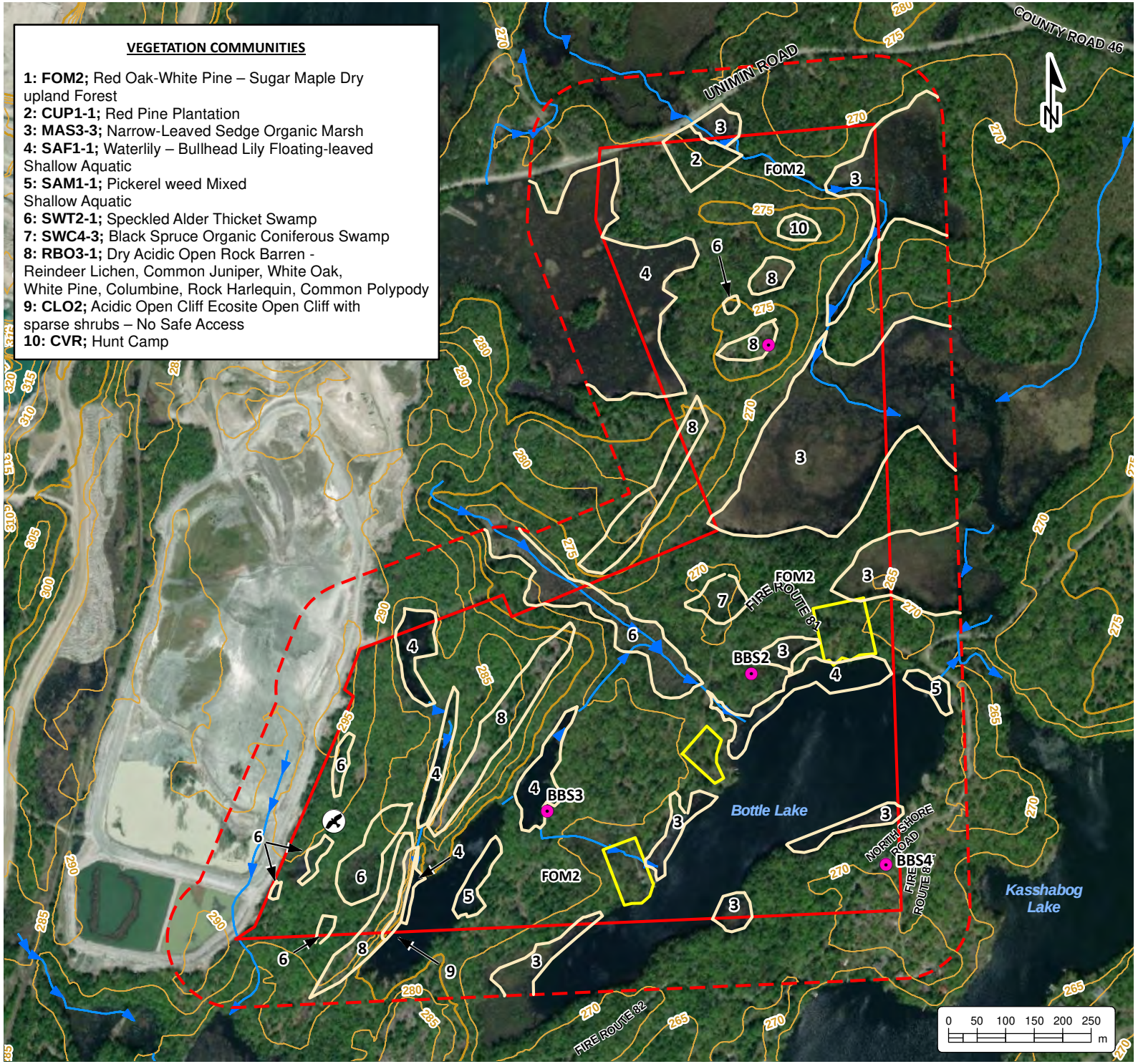
LOCAL NATURAL HERITAGE FEATURES

Project No.: 12750-001		Date: October 2021 Rev.:	
Scale: 1:27,500		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: MW	Figure:	2

O:\GIS\MXDs\12700-12799\12750-001 Covia Corp - Covia Lease Expansion - Natural Heritage Baseline Study\2021-09-16 FIG 2 - Local Natural Heritage Features.mxd



ENVIRONMENTAL BASELINE STUDY

COVIA CANADA LTD.
Nepheline Syenite Operation,
Havelock, Ontario

LEGEND

- Site (90.8 ha) (approximate)
- 120m Adjacent Lands
- Wood Thrush Nest
- Private Parcel Boundaries
- Breeding Bird Survey Stations (BBS)
- Watercourse, Permanent
- Contour 5m Interval (Major)
- Contour 5m Interval (Minor)
- Vegetation Community

Notes:
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SITE NATURAL HERITAGE FEATURES

Project No.: 12750-001		Date: October 2021	Rev.:
Scale: 1:9,500		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: MW	Figure: 3	

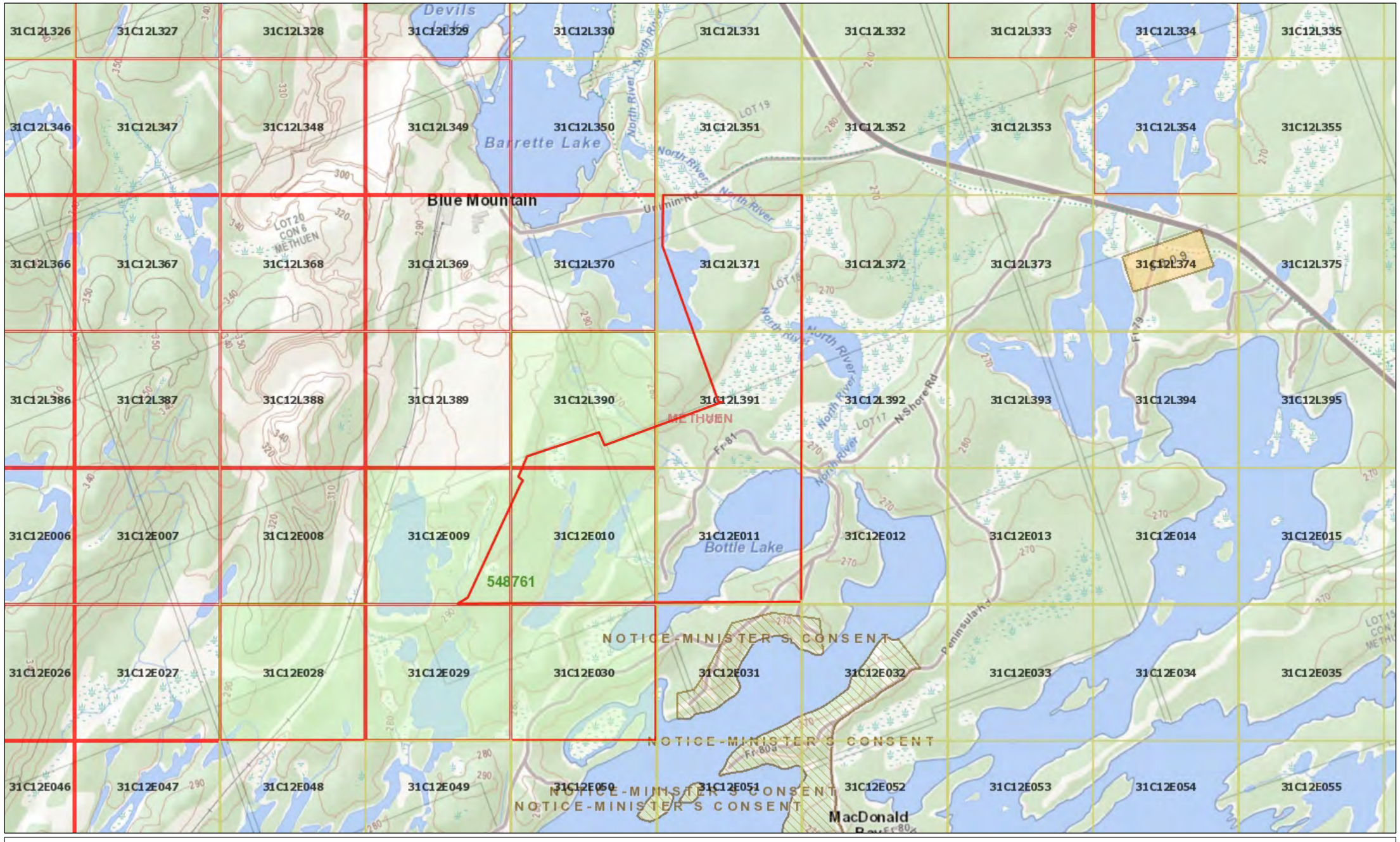
O:\GIS\MXDs\12700-12799\12750-001 Covia Corp - Covia Lease Expansion - Natural Heritage Baseline Study\2021-09-16 FIG 3 - Site Natural Heritage Features.mxd

Ontario

MINISTRY OF ENERGY, NORTHERN DEVELOPMENT AND MINES
MLAS Map Viewer

FIGURE 4 - Claim Map

Notes:



Legend

Provincial Grid Cell
- Available
- Pending
- Unavailable

Mining Claim
- Mining Claim
- Boundary Claim

Alienation
- Withdrawal
- Notice

ENDM Administrative Boundaries
- ENDM Townships and Areas
- Geographic Lot Fabirc
- UTM Grid 1K
- UTM Grid 10K
- Mining Division
- Mineral Exploration and Development Region
- CLUPA Protected Area - Far North
- Resident Geologist District
- Federal Land Other
- Native Reserves
- AMIS Sites
- AMIS Features
- Drill Hole
- Mineral Occurrences

MLAS Mining History
- Withdrawal - History
- Notice - History
- Mining Claim - History
- Mining Land Tenure - History
- Legacy Claim

Provincial Grid
- Provincial Grid 250K
- Provincial Grid 50K
- Provincial Grid Group

Land Tenure
- Surface Rights
- Mining Rights
- Mining and Surface Rights
- Order-in-Council

0 0.65 km

Projection: Web Mercator

N

Appendix A
Correspondence

Appendix B

Photographic Log

PROJECT NUMBER: 12750-001 DATES: June 11, 2021 July 30 2021 LOCATION: Blue Mountain, Havelock Field Staff: Keegan McKitterick Tessa Radimer

Vegetation Community Photo Appendix

Community 1 - Red Oak-White Pine-Sugar Maple Dry upland Forest Type

Community 2 - CUP1-1 Red Pine Plantation

Community 3 - MAS3-3 Narrow-Leaved Sedge Organic Marsh Type

Community 4 - SAF1-1 Waterlily – Bullhead Lily Floating-leaved Shallow Aquatic Type

Community 5 - SAM1-1 Pickerel weed Mixed Shallow Aquatic Type

Community 6 - SWT2-1 Speckled Alder Thicket Swamp Type

Community 7 - SWC4-3 – Black Spruce Organic Coniferous Swamp Type

Community 8 - RBO3-1 – Dry Acidic Open Rock Barren Type

Community 9 - CLO2 – Acidic Open Cliff Ecosite

Community 10 - CVR – Old hunt camp

Appendix C

Vegetation Species List

VEGETATION COMMUNITY CLASSIFICATION: Forest

COMMUNITY #: 1. FOM2

LOCATION: Blue Mountain

COORDINATES:

PROJECT NUMBER: 12750 - Covia

DATE: July 30, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Balsam Fir	Abies balsamea	Pinaceae	-3	5			S5
Manitoba Maple	Acer negundo	Aceraceae	0	0			S5
Striped Maple	Acer pensylvanicum	Aceraceae	3	7			S4
Sugar Maple	Acer saccharum	Aceraceae	3	4			S5
Red Maple	Acer rubrum	Aceraceae	0	4			S5
Common Yarrow	Achillea millefolium	Asteraceae	3				SNA
White Baneberry	Actaea pachypoda	Ranunculaceae	5	6			S5
Red Baneberry	Actaea rubra ssp. rubra	Ranunculaceae	3	6			S5
Garlic Mustard	Alliaria petiolata	Brassicaceae	0				SNA
Common Ragweed	Ambrosia artemisiifolia	Asteraceae	3	0			S5
Smooth Serviceberry	Amelanchier laevis	Rosaceae	5	5			S5
American Hog-peanut	Amphicarpaea bracteata	Fabaceae	0	4			S5
Pearly Everlasting	Anaphalis margaritacea	Asteraceae	3	3			S5
Sharp-lobed Hepatica	Hepatica acutiloba	Ranunculaceae	5	8			S5
Spreading Dogbane	Apocynum androsaemifolium	Apocynaceae	5	3			S5
Red Columbine	Aquilegia canadensis	Ranunculaceae	3	5			S5
Tower Mustard	Turritis glabra	Brassicaceae	5	4			S5
Wild Sarsaparilla	Aralia nudicaulis	Araliaceae	3	4			S5
Large-leaved Aster	Eurybia macrophylla	Asteraceae	5	5			S5
Common Lady Fern	Athyrium filix-femina	Dryopteridaceae	0	4			S5
Paper Birch	Betula papyrifera	Betulaceae	3	2			S5
Drooping Woodland Sedge	Carex arctata	Cyperaceae	5	5			S5
Pennsylvania Sedge	Carex pensylvanica	Cyperaceae	5	5			S5
Blue Cohosh	Caulophyllum thalictroides	Berberidaceae	5	5			S5
Canada Enchanter's Nightshade	Circaea canadensis ssp. canadensis	Onagraceae	3	2			S5
Eastern Spring Beauty	Claytonia virginica	Portulacaceae	3	5			S5

Yellow Clintonia	Clintonia borealis	Liliaceae	0	7			S5
Sweet-fern	Comptonia peregrina	Myricaceae	5	7			S5
Alternate-leaved Dogwood	Cornus alternifolia	Cornaceae	3	6			S5
Bunchberry	Cornus canadensis	Cornaceae	0	7			S5
Poverty Oatgrass	Danthonia spicata	Poaceae	5	5			S5
Wild Carrot	Daucus carota	Apiaceae	5				SNA
Canada Tick-trefoil	Desmodium canadense	Fabaceae	0	5			S4
Northern Bush-honeysuckle	Diervilla lonicera	Caprifoliaceae	5	5			S5
Eastern Leatherwood	Dirca palustris	Thymelaeaceae	0	7			S4
Marginal Wood Fern	Dryopteris marginalis	Dryopteridaceae	3	5			S5
Annual Fleabane	Erigeron annuus	Asteraceae	3	0			S5
Woodland Strawberry	Fragaria vesca ssp. vesca	Rosaceae	3				SNA
White Ash	Fraxinus americana	Oleaceae	3	4			S4
Eastern Teaberry	Gaultheria procumbens	Ericaceae	3	6			S5
Canada Avens	Geum canadense	Rosaceae	0	3			S5
Dame's Rocket	Hesperis matronalis	Brassicaceae	3				SNA
Orange Hawkweed	Pilosella aurantiaca	Asteraceae	5				SNA
Tall Blue Lettuce	Lactuca biennis	Asteraceae	0	6			S5
Canada Lettuce	Lactuca canadensis	Asteraceae	3	3			S5
Canada Fly Honeysuckle	Lonicera canadensis	Caprifoliaceae	3	6			S5
Stiff Clubmoss	Spinulum annotinum	Lycopodiaceae	0	6			S5
Wild Lily-of-the-valley	Maianthemum canadense ssp. canadense	Liliaceae	3	5			S5
Large False Solomon's Seal	Maianthemum racemosum	Liliaceae	3	4			S5
Star-flowered False Solomon's Seal	Maianthemum stellatum	Liliaceae	0	6			S5
White Sweet-clover	Melilotus albus	Fabaceae	3				SNA
Indian-pipe	Monotropa uniflora	Monotropaceae	3	6			S5
Woodland Sunflower	Helianthus divaricatus	Asteraceae	5	7			S5
Eastern Hop-hornbeam	Ostrya virginiana	Betulaceae	3	4			S5
Upright Yellow Wood-sorrel	Oxalis stricta	Oxalidaceae	3	0			S5
White Spruce	Picea glauca	Pinaceae	3	6			S5
Red Pine	Pinus resinosa	Pinaceae	3	8			S5
Eastern White Pine	Pinus strobus	Pinaceae	3	4			S5

Hairy Solomon's Seal	Polygonatum pubescens	Liliaceae	5	5			S5
Rock Polypody	Polypodium virginianum	Polypodiaceae	5	7			S5
Eastern Bracken Fern	Pteridium aquilinum var. latiusculum	Dennstaedtiaceae	3	2			S5
Eastern White Cedar	Thuja occidentalis	Cupressaceae	-3	4			S5
White Oak	Quercus alba	Fagaceae	3	6			S5
Bur Oak	Quercus macrocarpa	Fagaceae	3	5			S5
Northern Red Oak	Quercus rubra	Fagaceae	3	6			S5
Staghorn Sumac	Rhus typhina	Anacardiaceae	3	1			S5
Eastern Prickly Gooseberry	Ribes cynosbati	Grossulariaceae	3	4			S5
Allegheny Blackberry	Rubus allegheniensis	Rosaceae	3	2			S5
Blue-stemmed Goldenrod	Solidago caesia	Asteraceae	3	5			S5
Zigzag Goldenrod	Solidago flexicaulis	Asteraceae	3	6			S5
Rose Twisted-stalk	Streptopus lanceolatus	Liliaceae	3	7			S5
Canada Yew	Taxus canadensis	Taxaceae	3	7			S4
Basswood	Tilia americana	Tiliaceae	3	4			S5
Northern Starflower	Lysimachia borealis	Primulaceae	0	6			S5
Red Trillium	Trillium erectum	Liliaceae	3	6			S5
White Trillium	Trillium grandiflorum	Liliaceae	3	5			S5
Early Lowbush Blueberry	Vaccinium angustifolium	Ericaceae	3	6			S5
Hobblebush	Viburnum lantanoides	Caprifoliaceae	0	8			S5

NOTES: Large community covers that majority of the site - small patches of rock barren mapped as inclusions larger areas mapped separately

VEGETATION COMMUNITY CLASSIFICATION: Cultural Plantation

COMMUNITY #: 2. CUP1-1

LOCATION: Blue Mountain

COORDINATES: 44.5973456, -78.1955786

PROJECT NUMBER: 12750-Covia Mine

DATE: July 29, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Red Pine	Pinus resinosa	Pinaceae	3	8			S5
Wild Lily-of-the-valley	Maianthemum canadense ssp. canadense	Liliaceae	3	5			S5
Large False Solomon's Seal	Maianthemum racemosum	Liliaceae	3	4			S5
Marginal Wood Fern	Dryopteris marginalis	Dryopteridaceae	3	5			S5
Sugar Maple	Acer saccharum	Aceraceae	3	4			S5
Northern Red Oak	Quercus rubra	Fagaceae	3	6			S5
Maple-leaved Viburnum	Viburnum acerifolium	Caprifoliaceae	5	6			S5
Northern Bush-honeysuckle	Diervilla lonicera	Caprifoliaceae	5	5			S5
Poison Ivy	Toxicodendron radicans	Anacardiaceae	0	2			S5

NOTES: Red pine plantation - adjacent lands have renaturalized and are included in community 1

VEGETATION COMMUNITY CLASSIFICATION: Marsh

COMMUNITY #: 3. MAS3-3

LOCATION: Blue Mountain

COORDINATES: 44.5973454, -78.1955783

PROJECT NUMBER: 12750 Covia

DATE: July 30, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Silver Maple	*Acer saccharinum*	Aceraceae	-3	5			S5
American Sweetflag	*Acorus americanus*	Acoraceae	-5	8			S4
Speckled Alder	*Alnus incana ssp. rugosa*	Betulaceae	-3	6			S5
Meadow Horsetail	*Equisetum pratense*	Equisetaceae	-3	8			S5
Canada Anemone	*Anemonastrum canadense*	Ranunculaceae	-3	3			S5
New England Aster	*Symphyotrichum novae-angliae*	Asteraceae	-3	2			S5
Purple-stemmed Aster	*Symphyotrichum puniceum var. puniceum*	Asteraceae	-5	6			S5
Nodding Beggarticks	*Bidens cernua*	Asteraceae	-5	2			S5
Three-parted Beggarticks	*Bidens tripartita*	Asteraceae	-3	5			S5?
Watershield	*Brasenia schreberi*	Cabombaceae	-5	7			S5
Bluejoint Reedgrass	*Calamagrostis canadensis*	Poaceae	-5	4			S5
Wild Calla	*Calla palustris*	Araceae	-5	8			S5
Bebb's Sedge	*Carex bebbii*	Cyperaceae	-5	3			S5
Bearded Sedge	*Carex comosa*	Cyperaceae	-5	5			S5
Necklace Sedge	*Carex projecta*	Cyperaceae	-3	5			S5
Cyperus-like Sedge	*Carex pseudocyperus*	Cyperaceae	-5	6			S5
Retrorse Sedge	*Carex retrorsa*	Cyperaceae	-5	5			S5
Fox Sedge	*Carex vulpinoidea*	Cyperaceae	-5	3			S5
Common Hornwort	*Ceratophyllum demersum*	Ceratophyllaceae	-5	4			S5
White Turtlehead	*Chelone glabra*	Scrophulariaceae	-5	7			S5
Red-osier Dogwood	*Cornus sericea*	Cornaceae	-3	2			S5
Hairy Willowherb	*Epilobium hirsutum*	Onagraceae	-3				SNA
Water Horsetail	*Equisetum fluviatile*	Equisetaceae	-5	7			S5
Philadelphia Fleabane	*Erigeron philadelphicus var. philadelphicus*	Asteraceae	-3	1			S5
Spotted Joe Pye Weed	*Eutrochium maculatum var. maculatum*	Asteraceae	-5	3			S5

Common Boneset	*Eupatorium perfoliatum*	Asteraceae	-3	2			S5
Grass-leaved Goldenrod	*Euthamia graminifolia*	Asteraceae	0	2			S5
Common Marsh Bedstraw	*Galium palustre*	Rubiaceae	-5	5			S5
Fowl Mannagrass	*Glyceria striata var. striata*	Poaceae	-5	3			S5
Common Winterberry	*Ilex verticillata*	Aquifoliaceae	-3	5			S5
Spotted Jewelweed	*Impatiens capensis*	Balsaminaceae	-3	4			S5
Harlequin Blue Flag	*Iris versicolor*	Iridaceae	-5	5			S5
Pale Bog Laurel	*Kalmia polifolia*	Ericaceae	-5	10			S5
Common Labrador Tea	*Rhododendron groenlandicum*	Ericaceae	-5	9			S5
Northern Water-horehound	*Lycopus uniflorus*	Lamiaceae	-5	5			S5
Fringed Yellow Loosestrife	*Lysimachia ciliata*	Primulaceae	-3	4			S5
Purple Loosestrife	*Lythrum salicaria*	Lythraceae	-5				SNA
Star-flowered False Solomon's Seal	*Maianthemum stellatum*	Liliaceae	0	6			S5
Canada Mint	*Mentha canadensis*	Lamiaceae	-3	3			S5
Red Raspberry	*Rubus idaeus*	Rosaceae	3	2			S5
Bebb's Willow	*Salix bebbiana*	Salicaceae	-3	4			S5
Cottony Willow	*Salix eriocephala*	Salicaceae	-3	4			S5
Dark-green Bulrush	*Scirpus atrovirens*	Cyperaceae	-5	3			S5
Red-tinged Bulrush	*Scirpus microcarpus*	Cyperaceae	-5	4			S5
Common Water-parsnip	*Sium suave*	Apiaceae	-5	4			S5
Fraser's St. John's-wort	*Triadenum fraseri*	Clusiaceae	-5	7			S5
Nannyberry	*Viburnum lentago*	Caprifoliaceae	0	4			S5

NOTES: Large cattail marsh with standing water

VEGETATION COMMUNITY CLASSIFICATION: Marsh

COMMUNITY #: 4. SAF1-1

LOCATION: Blue Mountain

COORDINATES: 44.5973454, -78.1955783

PROJECT NUMBER: 12750 Covia Mine

DATE: July 30, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Silver Maple	Acer saccharinum	Aceraceae	-3	5			S5
American Sweetflag	Acorus americanus	Acoraceae	-5	8			S4
Speckled Alder	Alnus incana ssp. rugosa	Betulaceae	-3	6			S5
Meadow Horsetail	Equisetum pratense	Equisetaceae	-3	8			S5
Canada Anemone	Anemonastrum canadense	Ranunculaceae	-3	3			S5
New England Aster	Symphyotrichum novae-angliae	Asteraceae	-3	2			S5
Purple-stemmed Aster	Symphyotrichum puniceum var. puniceum	Asteraceae	-5	6			S5
Nodding Beggarticks	Bidens cernua	Asteraceae	-5	2			S5
Three-parted Beggarticks	Bidens tripartita	Asteraceae	-3	5			S5?
Watershield	Brasenia schreberi	Cabombaceae	-5	7			S5
Bluejoint Reedgrass	Calamagrostis canadensis	Poaceae	-5	4			S5
Wild Calla	Calla palustris	Araceae	-5	8			S5
Bebb's Sedge	Carex bebbii	Cyperaceae	-5	3			S5
Bearded Sedge	Carex comosa	Cyperaceae	-5	5			S5
Necklace Sedge	Carex projecta	Cyperaceae	-3	5			S5
Cyperus-like Sedge	Carex pseudocyperus	Cyperaceae	-5	6			S5
Retrorse Sedge	Carex retrorsa	Cyperaceae	-5	5			S5
Fox Sedge	Carex vulpinoidea	Cyperaceae	-5	3			S5
Common Hornwort	Ceratophyllum demersum	Ceratophyllaceae	-5	4			S5
White Turtlehead	Chelone glabra	Scrophulariaceae	-5	7			S5
Red-osier Dogwood	Cornus sericea	Cornaceae	-3	2			S5
Hairy Willowherb	Epilobium hirsutum	Onagraceae	-3				SNA
Water Horsetail	Equisetum fluviatile	Equisetaceae	-5	7			S5
Philadelphia Fleabane	Erigeron philadelphicus var. philadelphicus	Asteraceae	-3	1			S5
Spotted Joe Pye Weed	Eutrochium maculatum var. maculatum	Asteraceae	-5	3			S5
Common Boneset	Eupatorium perfoliatum	Asteraceae	-3	2			S5

Grass-leaved Goldenrod	Euthamia graminifolia	Asteraceae	0	2			S5
Common Marsh Bedstraw	Galium palustre	Rubiaceae	-5	5			S5
Fowl Mannagrass	Glyceria striata var. striata	Poaceae	-5	3			S5
Common Winterberry	Ilex verticillata	Aquifoliaceae	-3	5			S5
Spotted Jewelweed	Impatiens capensis	Balsaminaceae	-3	4			S5
Harlequin Blue Flag	Iris versicolor	Iridaceae	-5	5			S5
Pale Bog Laurel	Kalmia polifolia	Ericaceae	-5	10			S5
Common Labrador Tea	Rhododendron groenlandicum	Ericaceae	-5	9			S5
Northern Water-horehound	Lycopus uniflorus	Lamiaceae	-5	5			S5
Fringed Yellow Loosestrife	Lysimachia ciliata	Primulaceae	-3	4			S5
Purple Loosestrife	Lythrum salicaria	Lythraceae	-5				SNA
Star-flowered False Solomon's Seal	Maianthemum stellatum	Liliaceae	0	6			S5
Canada Mint	Mentha canadensis	Lamiaceae	-3	3			S5
Red Raspberry	Rubus idaeus	Rosaceae	3	2			S5
Bebb's Willow	Salix bebbiana	Salicaceae	-3	4			S5
Cottony Willow	Salix eriocephala	Salicaceae	-3	4			S5
Dark-green Bulrush	Scirpus atrovirens	Cyperaceae	-5	3			S5
Red-tinged Bulrush	Scirpus microcarpus	Cyperaceae	-5	4			S5
Common Water-parsnip	Sium suave	Apiaceae	-5	4			S5
Fraser's St. John's-wort	Triadenum fraseri	Clusiaceae	-5	7			S5
Nannyberry	Viburnum lentago	Caprifoliaceae	0	4			S5
Yellow Marsh Marigold	Caltha palustris	Ranunculaceae	-5	5			S5
Fowl Mannagrass	Glyceria striata var. striata	Poaceae	-5	3			S5
Sensitive Fern	Onoclea sensibilis	Dryopteridaceae	-3	4			S5
Pickerelweed	Pontederia cordata	Pontederiaceae	-5	7			S5
Variegated Pond-lily	Nuphar variegata	Nymphaeaceae	-5	7			S5
Fragrant Water-lily	Nymphaea odorata ssp. odorata	Nymphaeaceae	-5	5			S5?
Broad-leaved Arrowhead	Sagittaria latifolia	Alismataceae	-5	4			S5

NOTES: Thin edge of cattail marsh similar to community 3 but with large proportion of fixed floating and broad leaved emergent species including variegated and fragrant pond lily, pickerel weed and arrowhead

VEGETATION COMMUNITY CLASSIFICATION: Shallow Water

COMMUNITY #: 5. SAM1-1

LOCATION: Blue Mountain

COORDINATES: 44.5973454, -78.1955782

PROJECT NUMBER: 12750 Covia Mine

DATE: July 31, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Nodding Beggarticks	*Bidens cernua*	Asteraceae	-5	2			S5
Three-parted Beggarticks	*Bidens tripartita*	Asteraceae	-3	5			S5?
Watershield	*Brasenia schreberi*	Cabombaceae	-5	7			S5
Wild Calla	*Calla palustris*	Araceae	-5	8			S5
Hop Sedge	*Carex lupulina*	Cyperaceae	-5	6			S5
Cyperus-like Sedge	*Carex pseudocyperus*	Cyperaceae	-5	6			S5
Fox Sedge	*Carex vulpinoidea*	Cyperaceae	-5	3			S5
Necklace Sedge	*Carex projecta*	Cyperaceae	-3	5			S5
Canada Waterweed	*Elodea canadensis*	Hydrocharitaceae	-5	4			S5
Water Horsetail	*Equisetum fluviatile*	Equisetaceae	-5	7			S5
Common Boneset	*Eupatorium perfoliatum*	Asteraceae	-3	2			S5
Spotted Jewelweed	*Impatiens capensis*	Balsaminaceae	-3	4			S5
Harlequin Blue Flag	*Iris versicolor*	Iridaceae	-5	5			S5
Sheep Laurel	*Kalmia angustifolia*	Ericaceae	-5	-			S5
Fragrant Water-lily	*Nymphaea odorata ssp. odorata*	Nymphaeaceae	-5	5			S5?
Sensitive Fern	*Onoclea sensibilis*	Dryopteridaceae	-3	4			S5
Pickerelweed	*Pontederia cordata*	Pontederiaceae	-5	7			S5
Broad-leaved Arrowhead	*Sagittaria latifolia*	Alismataceae	-5	4			S5
Dark-green Bulrush	*Scirpus atrovirens*	Cyperaceae	-5	3			S5
Red-tinged Bulrush	*Scirpus microcarpus*	Cyperaceae	-5	4			S5

NOTES: Small pockets of pickerlweed dominated wetlands near shore with associated shoreline veg

VEGETATION COMMUNITY CLASSIFICATION: Swamp | COMMUNITY #: 6 - SWT2-1 | LOCATION: Blue Mountain | COORDINATES: 44.5973455, -78.1955779

PROJECT NUMBER: 12750 Covia Mine | DATE: July 30, 2021 | PROJECT MANAGER: Matthew Wheeler | FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Silver Maple	*Acer saccharinum*	Aceraceae	-3	5			S5
Speckled Alder	*Alnus incana ssp. rugosa*	Betulaceae	-3	6			S5
Swamp Milkweed	*Asclepias incarnata ssp. incarnata*	Apocynaceae	-5	6			S5
New England Aster	*Symphyotrichum novae-angliae*	Asteraceae	-3	2			S5
Nodding Beggarticks	*Bidens cernua*	Asteraceae	-5	2			S5
Bladder Sedge	*Carex intumescens*	Cyperaceae	-3	6			S5
Cyperus-like Sedge	*Carex pseudocyperus*	Cyperaceae	-5	6			S5
Retrorse Sedge	*Carex retrorsa*	Cyperaceae	-5	5			S5
Leatherleaf	*Chamaedaphne calyculata*	Ericaceae	-5	9			S5
Hairy Willowherb	*Epilobium hirsutum*	Onagraceae	-3				SNA
Spotted Joe Pye Weed	*Eutrochium maculatum var. maculatum*	Asteraceae	-5	3			S5
Grass-leaved Goldenrod	*Euthamia graminifolia*	Asteraceae	0	2			S5
Black Ash	*Fraxinus nigra*	Oleaceae	-3	7			S3
Fowl Mannagrass	*Glyceria striata var. striata*	Poaceae	-5	3			S5
Common Winterberry	*Ilex verticillata*	Aquifoliaceae	-3	5			S5
Northern Water-horehound	*Lycopus uniflorus*	Lamiaceae	-5	5			S5
Canada Mint	*Mentha canadensis*	Lamiaceae	-3	3			S5
Sensitive Fern	*Onoclea sensibilis*	Dryopteridaceae	-3	4			S5
Cinnamon Fern	*Osmundastrum cinnamomeum*	Osmundaceae	-3	7			S5
Royal Fern	*Osmunda regalis var. spectabilis*	Osmundaceae	-5	7			S5
Dwarf Clearweed	*Pilea pumila*	Urticaceae	-3	5			S5
Bristly Black Currant	*Ribes lacustre*	Grossulariaceae	-3	7			S5
Cottony Willow	*Salix eriocephala*	Salicaceae	-3	4			S5
Shining Willow	*Salix lucida*	Salicaceae	-3	5			S5

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Dark-green Bulrush	*Scirpus atrovirens*	Cyperaceae	-5	3			S5
Red-tinged Bulrush	*Scirpus microcarpus*	Cyperaceae	-5	4			S5
Bittersweet Nightshade	*Solanum dulcamara*	Solanaceae	0				SNA
Small Burreed	*Sparganium natans*	Sparganiaceae	-5	8			S5
Broad-leaved Cattail	*Typha latifolia*	Typhaceae	-5	1			S5
Nannyberry	*Viburnum lentago*	Caprifoliaceae	0	4			S5

NOTES: Large thicket swamp in central portion of study area with other wetland types mapped as small inclusions within - additional small thicket swamps in low-lying areas scattered across community 1

VEGETATION COMMUNITY CLASSIFICATION: Swamp

COMMUNITY #: 7 – SWC4-3

LOCATION: Blue Mountain

COORDINATES: 44.5973455, -78.1955777

PROJECT NUMBER: 12750 Covia Mine

DATE: July 30, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Black Spruce	*Picea mariana*	Pinaceae	-3	8			S5
Balsam Fir	*Abies balsamea*	Pinaceae	-3	5			S5
Common Labrador Tea	*Rhododendron groenlandicum*	Ericaceae	-5	9			S5
Yellow Clintonia	*Clintonia borealis*	Liliaceae	0	7			S5
Northern Starflower	*Lysimachia borealis*	Primulaceae	0	6			S5
Partridgeberry	*Mitchella repens*	Rubiaceae	3	6			S5
Woodland Horsetail	*Equisetum sylvaticum*	Equisetaceae	-3	7			S5
Canada Mint	*Mentha canadensis*	Lamiaceae	-3	3			S5
Steeplebush	*Spiraea tomentosa var. tomentosa*	Rosaceae	-3				SU
Bulblet Bladder Fern	*Cystopteris bulbifera*	Dryopteridaceae	-3	5			S5
Bladder Sedge	*Carex intumescens*	Cyperaceae	-3	6			S5

NOTES: Black spruce-balsam fir dominated with dense sphagnum moss understory with open patches of water.

VEGETATION COMMUNITY CLASSIFICATION: Rock Barren

COMMUNITY #: 8 - RBO3-1

LOCATION: Blue Mountain

COORDINATES: 44.5973454, -78.1955776

PROJECT NUMBER: 12750 Covia Mine

DATE: July 30, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Northern Red Oak	*Quercus rubra*	Fagaceae	3	6			S5
Eastern White Pine	*Pinus strobus*	Pinaceae	3	4			S5
White Oak	*Quercus alba*	Fagaceae	3	6			S5
Poverty Oatgrass	*Danthonia spicata*	Poaceae	5	5			S5
Commons Panicgrass	*Panicum capillare*	Poaceae	3	6			S5
Pale Corydalis	*Capnoides sempervirens*	Fumariaceae	5	7			S5
Red Columbine	*Aquilegia canadensis*	Ranunculaceae	3	5			S5
Common Juniper	*Juniperus communis var. communis*	Cupressaceae	3				SNA
Rock Polypody	*Polypodium virginianum*	Polypodiaceae	5	7			S5

NOTES: Small rock Barrens scattered through out community 1 - long ridge running NE - SW across study area - reindeer lichen and large unvegetated areas

VEGETATION COMMUNITY CLASSIFICATION: Cliff

COMMUNITY #: 9 - CLO2

LOCATION: Blue Mountain

COORDINATES: 44.5973454, -78.1955785

PROJECT NUMBER: 12750 Covia Mine

DATE: July 30, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Rock Polypody	Polypodium virginianum	Polypodiaceae	5	7			S5
Common Juniper	Juniperus communis var. communis	Cupressaceae	3				SNA
Speckled Alder	Alnus incana ssp. rugosa	Betulaceae	-3	6			S5

NOTES: Open cliff face aloadjacent to large waterbody - reindeer lichen and open un vegetated area as well as space shrubs occupying small crevices

Appendix D

Bird Species List

VEGETATION COMMUNITY CLASSIFICATION: Forest

LOCATION: Blue Mountain Mine, Bottle Lake

COORDINATES: 44.5973456, -78.1955785

POINT COUNT #: 1

PROJECT NUMBER: 12750-001

DATE: June 11, 2021 July 31, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 11, 2021						
Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Robin	*Turdus migratorius*	Turdidae			S5B	S
Black-and-white Warbler	*Mniotilta varia*	Parulidae			S5B	S
Black-throated Blue Warbler	*Setophaga caerulescens*	Parulidae			S5B	S
Black-throated Green Warbler	*Setophaga virens*	Parulidae			S5B	S
Blue Jay	*Cyanocitta cristata*	Corvidae			S5	S
Chestnut-sided Warbler	*Setophaga pensylvanica*	Parulidae			S5B	S
Common Raven	*Corvus corax*	Corvidae			S5	S
Ovenbird	*Seiurus aurocapilla*	Parulidae			S4B	S
Pine Warbler	*Setophaga pinus*	Parulidae			S5B	S
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	S
Red-winged Blackbird	*Agelaius phoeniceus*	Icteridae			S4	S
Veery	*Catharus fuscescens*	Turdidae			S4B	S
Wood Duck	*Aix sponsa*	Anatidae			S5	H

July 31, 2021						
Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Robin	*Turdus migratorius*	Turdidae			S5B	T
Black-and-white Warbler	*Mniotilta varia*	Parulidae			S5B	T
Black-throated Blue Warbler	*Setophaga caerulescens*	Parulidae			S5B	T
Black-throated Green Warbler	*Setophaga virens*	Parulidae			S5B	T
Blue Jay	*Cyanocitta cristata*	Corvidae			S5	T
Chestnut-sided Warbler	*Setophaga pensylvanica*	Parulidae			S5B	T
Ovenbird	*Seiurus aurocapilla*	Parulidae			S4B	T
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	T
Red-winged Blackbird	*Agelaius phoeniceus*	Icteridae			S4	T
Veery	*Catharus fuscescens*	Turdidae			S4B	T

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

X = Species observed in its breeding season (no breeding evidence)
H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
P= Pair observed in their breeding season in suitable nesting habitat
T= Permanent territory presumed through registration of territorial song on at least 2 days, a week apart, at the same place
D= Courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V= Visiting probable nest site
X = Species observed in its breeding season (no breeding evidence)
CF= Adult carrying food for young
NE= Nest containing eggs

A = Agitated behaviour or anxiety calls of an adult
B= Brood patch on adult female or cloacal protuberance on adult male
N= Nest-building or excavation of nest hole
DD= Distraction display or injury feigning
NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight
AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

NOTES: Forested area on edge of wetland - granite rock Barrens opening to west

VEGETATION COMMUNITY CLASSIFICATION: Forest

LOCATION: Blue Mountain Mine, Bottle Lake

COORDINATES: 44.5973455, -78.1955786

POINT COUNT #: 2

PROJECT NUMBER: 12750-001

DATE: June 11, 2021 July 31, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 11, 2021

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Robin	*Turdus migratorius*	Turdidae			S5B	P
Black-throated Blue Warbler	*Setophaga caerulescens*	Parulidae			S5B	S
Black-throated Green Warbler	*Setophaga virens*	Parulidae			S5B	S
Chestnut-sided Warbler	*Setophaga pensylvanica*	Parulidae			S5B	S
Common Loon	*Gavia immer*	Gaviidae		NAR	S5B,S5N	S
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	S
Ovenbird	*Seiurus aurocapilla*	Parulidae			S4B	S
White-breasted Nuthatch	*Sitta carolinensis*	Sittidae			S5	S
Wood Thrush	*Hylocichla mustelina*	Turdidae	THR	SC	S4B	S

July 31, 2021

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Robin	*Turdus migratorius*	Turdidae			S5B	P
Black-and-white Warbler	*Mniotilta varia*	Parulidae			S5B	S
Black-throated Blue Warbler	*Setophaga caerulescens*	Parulidae			S5B	T
Black-throated Green Warbler	*Setophaga virens*	Parulidae			S5B	T
Chestnut-sided Warbler	*Setophaga pensylvanica*	Parulidae			S5B	T
Common Loon	*Gavia immer*	Gaviidae		NAR	S5B,S5N	T
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	T
Ovenbird	*Seiurus aurocapilla*	Parulidae			S4B	T
Wood Thrush	*Hylocichla mustelina*	Turdidae	THR	SC	S4B	T

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

X = Species observed in its breeding season (no breeding evidence)
H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
P= Pair observed in their breeding season in suitable nesting habitat

A = Agitated behaviour or anxiety calls of an adult
B= Brood patch on adult female or cloacal protuberance on adult male
N= Nest-building or excavation of nest hole
DD= Distraction display or injury feigning

T= Permanent territory presumed through registration of territorial song on at least 2 days, a week apart, at the same place
D= Courtship or display between a male and a female or 2 males, including courtship feeding or copulation
V= Visiting probable nest site
X = Species observed in its breeding season (no breeding evidence)
CF= Adult carrying food for young
NE= Nest containing eggs
NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight
AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

NOTES: Forest area west of fire rd 81 in Central part of study area - bottle lake to South East

VEGETATION COMMUNITY CLASSIFICATION: Woodland

LOCATION: Blue Mountain Mine, Bottle Lake

COORDINATES: 44.5973454, -78.1955783

POINT COUNT #: 3

PROJECT NUMBER: 12750-001

DATE: June 11, 2021 July 31, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 11, 2021

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
Belted Kingfisher	*Megaceryle alcyon*	Alcedinidae			S4B	S
Black-throated Blue Warbler	*Setophaga caerulescens*	Parulidae			S5B	S
Common Raven	*Corvus corax*	Corvidae			S5	H
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	S
Great Blue Heron	*Ardea herodias*	Ardeidae			S4	H
Mallard	*Anas platyrhynchos*	Anatidae			S5	H
Pileated Woodpecker	*Dryocopus pileatus*	Picidae			S5	S
Pine Warbler	*Setophaga pinus*	Parulidae			S5B	S
Red-breasted Merganser	*Mergus serrator*	Anatidae			S4B,S5N	H
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	S
Red-winged Blackbird	*Agelaius phoeniceus*	Icteridae			S4	H
Veery	*Catharus fuscescens*	Turdidae			S4B	S

July 31, 2021

Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
Black-and-white Warbler	*Mniotilta varia*	Parulidae			S5B	S
Black-throated Blue Warbler	*Setophaga caerulescens*	Parulidae			S5B	T
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	T
Eastern Wood-Pewee	*Contopus virens*	Tyranidae		SC	S4	S
Great Blue Heron	*Ardea herodias*	Ardeidae			S4	H
Pine Warbler	*Setophaga pinus*	Parulidae			S5B	T
Red-breasted Merganser	*Mergus serrator*	Anatidae			S4B,S5N	H
Red-eyed Vireo	*Vireo olivaceus*	Vireonidae			S5B	T
Red-winged Blackbird	*Agelaius phoeniceus*	Icteridae			S4	H
Veery	*Catharus fuscescens*	Turdidae			S4B	T

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

X = Species observed in its breeding season (no breeding evidence)
H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
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N= Nest-building or excavation of nest hole
DD= Distraction display or injury feigning
NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight
AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

NOTES: South end near large open water forest behind open cliff across

VEGETATION COMMUNITY CLASSIFICATION: Forest

LOCATION: Blue Mountain Mine, Bottle Lake

COORDINATES: 44.5973454, -78.195578

POINT COUNT #: 4

PROJECT NUMBER: 12750-001

DATE: June 11, 2021 July 31, 2021

PROJECT MANAGER: Matthew Wheeler

FIELD STAFF: Keegan McKitterick

FIELD SHEET – Bird Species List

June 11, 2021						
Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Robin	*Turdus migratorius*	Turdidae			S5B	S
Blue Jay	*Cyanocitta cristata*	Corvidae			S5	S
Brown Thrasher	*Toxostoma rufum*	Mimidae			S4B	S
Chestnut-sided Warbler	*Setophaga pensylvanica*	Parulidae			S5B	S
Common Grackle	*Quiscalus quiscula*	Icteridae			S5B	S
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	S
Eastern Phoebe	*Sayornis phoebe*	Tyrannidae			S5B	S
House Wren	*Troglodytes aedon*	Troglodytidae			S5B	S
White-breasted Nuthatch	*Sitta carolinensis*	Sittidae			S5	S

July 31, 2021						
Common Name	Scientific Name	Family	SARA	SARO	S-Rank	Breeding Evidence
American Robin	*Turdus migratorius*	Turdidae			S5B	T
Blue Jay	*Cyanocitta cristata*	Corvidae			S5	T
Chestnut-sided Warbler	*Setophaga pensylvanica*	Parulidae			S5B	T
Common Grackle	*Quiscalus quiscula*	Icteridae			S5B	T
Common Yellowthroat	*Geothlypis trichas*	Parulidae			S5B	T
Eastern Phoebe	*Sayornis phoebe*	Tyrannidae			S5B	T
House Wren	*Troglodytes aedon*	Troglodytidae			S5B	T
White-breasted Nuthatch	*Sitta carolinensis*	Sittidae			S5	T

Shaded cells indicate probable or confirmed breeding by the species within the vegetation community.

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H = Species observed in its breeding season in suitable nesting habitat
S= Singing male present, or breeding calls heard, in its breeding season in suitable nesting habitat
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A = Agitated behaviour or anxiety calls of an adult
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N= Nest-building or excavation of nest hole
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NU= Used nest or egg shell found (occupied or laid within the period of study)
FY= Recently fledged young or downy young, including young incapable to sustain flight

V= Visiting probable nest site
X = Species observed in its breeding season (no breeding evidence)
CF= Adult carrying food for young
NE= Nest containing eggs

AE= Adults leaving or entering nest site in circumstances indicating occupied nest
FS= Adult carrying faecal sac
NY= Nest with young seen or heard

NOTES: South side of bottle lake near residential/seasonal cottages - large open area with space exposed granite in center between fire route 82 and 82A

Appendix E

Curriculum Vitae

KEEGAN McKITTERICK, Hons.B.SC, Adv. Dipl. Ecosystem Management *Project Coord. / Intermediate Biologist*

Mr. McKitterick holds a Bachelor of Science from the University of Guelph, and an Advanced Standing Diploma in Ecosystem Management from Fleming College. Mr. McKitterick is an ecologist/biologist with 7 years of experience in a variety of ecosystems and a special focus in vegetation communities. He is certified in the Ontario Wetland Evaluation System (OWES), Ontario Benthos Biomonitoring Network and as a Managed Forest Plan Approver (MFPA) and has extensive experience in conducting vegetation inventories using the Southern and Northern Ontario Ecological Land Classification (ELC) system. Mr. McKitterick has extensive experience conducting ecological inventories, including vegetation surveys, breeding bird surveys (including marsh monitoring) and Night Jar surveys, snake and turtle basking surveys, as well as amphibian call and roadside mortality surveys. Mr. McKitterick has prepared EIS reports for private landowners for both small scale projects including property severances, as well as larger developments. He has also prepared a number of Wetland Evaluations both on behalf of the MNRF and for private land owners, as well as numerous managed forest plans. In addition to this work, Mr. McKitterick has previously worked as an Instructor at Fleming College where he taught courses focused on the OWES and ELC protocols as well as field ornithology.

SUMMARY OF PROFESSIONAL EXPERIENCE

2021 - Present	Project Coordinator/Intermediate Biologist. Cambium Inc. Peterborough, Ontario, Canada *Preform ecological inventories, ecological reporting, and co-ordinating work tasks. Work directly with clients on small-scale projects including severances and single lot development and assist project managers with larger projects*
2016 - 2021	Principal Ecologist. McKitterick Consulting North Kawartha, Ontario, Canada *Description of experiences gained*
2016-2020	Instructor. Fleming College Lindsay, Ontario, Canada *Description of experiences gained*
2018-2019	Land Conservation Technician. Kawartha Land Trust Peterborough, Ontario, Canada *Description of experiences gained*

2017-2017	Team Lead – Youth Stewardship Ranger Program. MNRF Aurora, Ontario, Canada *Description of experiences gained*
2015-2016	Team Lead – Lake Simcoe Vegetation Monitoring Project. MNRF/University of Toronto Aurora, Ontario, Canada *Description of experiences gained*
2014-2015	Wetland Habitat Technician. MNRF Aurora, Ontario, Canada *Description of experiences gained*
2013-2014	Aquatic Habitat Technician. Halton Region City, Province, Country *Description of experiences gained*

PROFESSIONAL ASSOCIATIONS

- Field Botanists of Ontario
- Peterborough County Stewardship – Board of Directors

EDUCATION & TRAINING

2021 (Ongoing)	M. Sc. University of Guelph Guelph, Ontario, Canada
2014	Advanced Diploma, Ecosystem Management Technology. Fleming College Lindsay, Ontario, Canada
2013	Honours Bachelor of Science, Biology and Ecology. University of Guelph City, Province, Country

LANGUAGES

- English

TESSA RADIMER, Hons. BSc. *Technician*

Tessa Radimer holds an Honours degree in Environmental and Resource Science from Trent University. She has recently accepted a position as a technician with Cambium Inc. Ms. Radimer also holds over two years experience in environmental fieldwork through volunteering for environmental consulting firms and local conservation authorities, as well as through independent research projects including in water sampling, benthic invertebrate biomonitoring, species at risk monitoring, and terrestrial plant identification.

SUMMARY OF PROFESSIONAL EXPERIENCE

2021-Present — Technician. Cambium Inc.
Peterborough, Ontario, Canada.
Conducted a variety of natural science field work tasks including Ecological Land Classifications, aquatic surveys, amphibian surveys, grassland bird surveys, reptile surveys, species at risk surveys, water quality testing, and landfill sampling. Assisted with data entry and report writing of Natural Heritage Evaluations, Environmental Impact Studies, and Environmental Management Plants. Provided assistance as needed to various groups within the Environmental Service Line.

2020 — Natural Sciences Intern. Cambium Inc.
Peterborough, Ontario, Canada
Created a species at risk screening tool to be used in company ecological assessments. Developed skills in field research methods by assisting in field research including water sampling, pollution monitoring, and species inventories as well as in Excel programming, mapping, and environmental assessments.

2019-2020 — Benthic Biomonitoring Researcher. Trent U-Links
Peterborough, Ontario, Canada
Conducted water chemistry and benthic invertebrate sampling to assess the health of Gull Lake, Haliburton. Conducted an analysis of large pools of current and historical data, and created reports based on findings, presenting future research and stewardship recommendations for the Gull Lake Cottagers Association.

2019 — Environmental Science Tutor. Trent University.
Peterborough, Ontario, Canada.
Assisted student with environmental chemistry content and learning strategies.

EDUCATION & TRAINING

Education

2021 — Environmental & Resource Science : Trent University.
Peterborough, Ontario, Canada.

Training

2021	Workplace Hazardous Materials Information System (WHMIS): Cambium Inc. Peterborough, Ontario, Canada.
2021	Pleasure Craft Operators Card
2020	First Aid and CPR training: St. John's Ambulance. St. Catharines, Ontario, Canada.
2019	Ontario Benthos Biomonitoring Network: Trent University. Peterborough, Ontario, Canada.

PUBLICATIONS

Using Disability Studies to Inform Nature Conservation, *undergraduate thesis for Trent University, (2021)*

Aquatic Health Assessment of Gull Lake, *U-Links Centre for Community Based Research, (2020)*

LANGUAGES

English (fluent); French (intermediately fluent)

MATTHEW WHEELER, *Project Manager / Senior Ecologist*

B.A. Geography, Post Graduate Certificate Ecosystem Restoration

Mr. Wheeler has 15 years of experience delivering environmental services including project management, Environmental Assessments (EA), permits/approvals/authorizations, environmental impact statements (EIS), biological inventories, species at risk (SAR) assessments, wildlife surveys, pit and quarry rehabilitation, and mine reclamation. He has extensive experience completing the Class EA process for Provincial Transportation Facilities and for railway corridors. He has worked with private, municipal, and federal clients in a variety of sectors. He has authored four (4) Best Management Practice (BMP) guides for Industry. He has obtained permits/approvals/authorizations for species at risk (SAR), and applied innovative approaches to SAR conservation. Matthew is familiar with leading client relations, public consultation programs, and agency collaboration. He seeks to provide "buildable and biddable" solutions that allow clients to engage in activities that comply with municipal, provincial and federal legislation.

SUMMARY OF PROFESSIONAL EXPERIENCE

2020 - Present — Senior Ecologist / Project Manager. Cambium Inc.

Kingston, Ontario, Canada

Mr. Wheeler coordinates and conducts terrestrial biomonitoring programs, Ecological Land Classification, Ontario Wetland Evaluation System habitat delineation, species at risk surveys, and environmental impacts studies. He is responsible for project management, client relations, regulatory compliance, technical reporting and agency consultation.

2011 - 2020 — Senior Ecologist /Practice Area Lead. McIntosh Perry Consulting Engineers

Kingston, Ontario, Canada

Mr. Wheeler provided natural heritage services throughout Ontario for private, municipal, provincial and federal clients. He has participated in and led natural heritage evaluations, applied biological research, species at risk assessments, terrestrial and aquatic ecosystem classification, Class Environmental Assessments, ecological restoration, planting plans, mine reclamation design, environmental impact statements, road ecology design and monitoring, public consultation, permits/approvals, tender assembly, contract administration, and construction monitoring. Mr. Wheeler's is responsible for delivering project management services including proposal writing, field and office scheduling of staff, sub-consultant management, client relations, budget tracking, invoicing, schedule adherence, and quality control of technical deliverables and public consultation materials. He led the development of best management practice documents for industry. His work using conservation dogs to detect nests of species at risk turtles along roadways secured McIntosh Perry a Creative Solutions Award from the Consulting Engineers of Ontario. Assisted in the procurement and management of environmental retainers for provincial agencies.

2008 - 2010 — Restoration Technologist. The Ontario Aggregate Resources Corporation

Kingston, Ontario, Canada

Collaborated with landowners, agencies, contractors, and colleagues to rehabilitate over 60 aggregate properties (pits/quarries) across Ontario. Designed, installed, and monitored ecological restoration projects at former aggregate sites to establish functional habitat for common, rare and species at risk plants and wildlife. Engaged Universities to conduct applied research and progress aggregate rehabilitation techniques using native plants and animals.

PROFESSIONAL ASSOCIATIONS

- Field Botanists of Ontario

EDUCATION & TRAINING

- Valid Ontario Driver's Licence (GM)
- 2018 (Renewal) Class 2 Backpack Electrofishing Certification
- 2014 Project Management Training PSMJ
- 2013-2014 Sedge and Grass Identification Workshops, New York Flora Association
- 2013 Grass Identification Workshop, Royal Botanical Gardens
- 2012 Ontario Wetland Evaluation System Evaluator
- 2011 MTO/DFO/OMNR Fisheries Protocol Training Session
- 2011 Wetland Plant Taxonomy and Identification, University of Guelph
- 2010 Ecological Land Classification System
- 2009 Certified Ontario Seed Collector, Forest Gene Conservation Association/MNR
- 2008 Natural Heritage Data Sensitivity Training, Ministry of Natural Resources
- 2007 Fungi Cultivation and Mycorestoration with Paul Stamets
- 2006 Soil Bioengineering with Woody Plants with Dave Polster

PUBLICATIONS

Beneficial Practices for Compliance with the Migratory Birds Convention Act and Regulations. Transportation Association of Canada (2019) Pages 1-172

Operational Guidance for Migratory Birds and Vegetation Management for Existing Transportation Facilities and Infrastructure , Transportation Association of Canada (2019) Pages 1-48

Operational Guidance for Migratory Bird Nests under Bridges and in Culverts, Transportation Association of Canada (2019) Pages 1-44

Using Detection Dogs to Monitor Aquatic Ecosystem Health and Protect Aquatic Resources. (2018) Palgrave MacMillian Publishing. Pages 303-317

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SELECTED EXPERIENCE

GENERAL PROJECT MANAGEMENT

Mr. Wheeler has more than a decade of experience providing project management services for a wide range of projects including mining, aggregates, private development, linear infrastructure, municipal assets, federal properties, and indigenous communities. He has completed project management training from PSMJ to streamline project delivery, track financial performance, achieve regulatory conformance and most importantly, ensure client satisfaction. By delivering over 150 projects for private, municipal, provincial and federal clients, Mr. Wheeler has gained project management experience to improve client satisfaction and generate high-value outcomes. He has provided services to municipalities, Parks Canada, Ministry of Transportation of Ontario (MTO), Ministry of Northern

Mines and Development (MNDM), Metrolinx, Ministry of Natural Resources and Forestry, private developers, private landowners, construction firms, engineering and architectural firms, and academic institutions. He seeks to deliver cost-effective solutions to complex real-world challenges, achieve compliance with regulatory standards and legislation, provide exceptional client relations, maintain schedules through the project lifecycle, and ensure work is completed on time and on budget.

ROADS AND RAILWAYS– VARIOUS LOCATIONS ONTARIO

Mr. Wheeler has over a decade of experience servicing provincial clients in Ontario in support of road and rail networks. Through the delivery of over 125 projects, he has led the *Class Environmental Assessment* process, the Transit Project Assessment Process (TPAP), field studies, data management, public consultation, technical reporting, permits/approvals/exemptions, sub-consultant management, contract document assembly, stakeholder engagement, construction monitoring, post-construction monitoring, and client relations. Mr. Wheeler has designed and led field studies for aquatic and terrestrial ecosystems. He is familiar with ensuring proposed activities are carried out in compliance with the *Endangered Species Act, Species at Risk Act, Fisheries Act, Migratory Birds Convention Act*, *Fish and Wildlife Conservation Act*, Environmental Standards and Practices, and other legislative instruments. He has extensive experience with bridge and culvert work, paving operations, utilities, creation of new infrastructure, tree removals, vegetation management, and drainage improvements/maintenance. He has developed, installed and monitored native plantings to benefit pollinators along a rail corridor in the Greater Toronto Area. He has developed comprehensive large scale compensation plans across multiple jurisdictions to offset impacts created by infrastructure improvements while ensuring no loss of natural capital (i.e. the intrinsic and economic valuation of natural assets including soil, water, biodiversity, etc.) through compensation via applied ecological restoration.

SPECIES AT RISK INVENTORY, ASSESSMENT, MITIGATION AND AUTHORIZATIONS/PERMITS

Mr. Wheeler has 13 of experience working with Species at Risk (SAR) vascular plants, insects, mammals, fishes, birds and reptiles. Work settings include landfills, municipal roadways, provincial highways, Canadian Forces Base, National Capital Commission lands, active construction sites, private lands, Provincial and Federal Parks, solar farms, wind farms, licenced aggregate extraction sites, an airport and railway corridors. Mr. Wheeler has led the acquisition of permits/approvals/exemptions under the *Endangered Species Act* (provincial) and *Species at Risk Act* (federal). He is comfortable leading field surveys and walking clients through complex regulatory processes. He develop a best management practice guide for industry to conserve SAR and their habitat during vegetation management activities for the *Ministry of Natural Resources and Forestry*.

He has delivered post-construction monitoring for permits and authorizations to ensure conditions of legislative exemptions were followed by proponents. He has obtained Wildlife Scientific Collector's Authorization to capture, handle, transport and move SAR wildlife out of active construction areas. Matthew coordinated and participated in targeted species at risk surveys for Bobolink, Eastern Meadowlark, Barn Swallow, Kirtland's Warbler, Henslow's Sparrow, Whip-poor-will, Least Bittern, Common Nighthawk, Eastern Wood Pewee, Golden Winged Warbler, Chimney Swift, Cerulean Warbler, Map Turtle, Blanding's Turtle, Wood Turtle, Spotted Turtle, Eastern Musk Turtle, Snapping Turtle, Massasauga (rattlesnake), Eastern Hog-nosed Snake, Gray Ratsnake, Eastern Foxsnake, Eastern Ribbonsnake, Dwarf Hackberry, Dense Blazing Star, Kentucky Coffee-tree, Hill's Thistle, Green Dragon, Juniper Sedge, Butternut, Red Mulberry, Blue Ash, Rusty-patched Bumble Bee, Monarch, Red-side Dace, Pugnose Shiner, Grass Pickerel, Algonquin Wolf, Northern Myotis, Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, Tri-coloured Bat, and other species.

He has led targeted Species at Risk surveys at more than 25 locations to ensure highway improvement activities are compliant with the *Endangered Species Act*. He has acquired authorizations and permits to safely capture and relocate turtle populations. He has designed over 5,000 metres of permanent turtle exclusion fencing at various locations in Ontario to reduce turtle road mortality. Collaborating with multiple levels of government he secured provincial funding ($60,000) under the SAR Stewardship Fund to assist a municipality install permanent turtle exclusion fencing, construct nesting habitat for turtles and inform the public of conservation actions.

Appendix F

Species of Conservation Concern Screening

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Birds								
Bald Eagle	*Haliaeetus leucocephalus*	No Status	SC	S2N,S4B	The Bald Eagle is a bird of prey with a white head, neck and tail, a massive bright yellow beak, powerful legs, and a wingspan of over 2 m. It nests in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. These nests are usually on islands in freshwater lakes or in large trees such as the pine and poplar. During the winter, they may also be found near open bodies of water that do not freeze (1).	Yes: on-site and adjacent lands	Confirmed absent through targeted surveys	No further consideration required
Bank Swallow	*Riparia riparia*	THR	THR	S4B	The Bank Swallow is a small songbird of around 12 cm long with a distinctive dark breast band, that flies with quick and erratic wingbeats (1). It nests in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. This can include banks of rivers and lakes, bluffs, active sand and gravel pits, road cuts and stockpiles of soils. However, they prefer sand-silt substrates for excavating their nest burrows. They often use large wetlands as communal nocturnal roosts post-breeding or during wintering periods (2).	Yes: adjacent lands only	Confirmed absent through targeted surveys	No further consideration required
Barn Swallow	*Hirundo rustica*	THR	THR	S4B	The Barn Swallow is a mid-sized songbird with steel-blue backs and wings, glossy in males, and a line of white spots across its upper tail. It lives in a variety of open habitats for foraging, such as grassy fields, pastures, certain agricultural crops, shorelines, cottage areas, wetlands, or subarctic tundra (2). They prefer to nest within human made structures such as barns, bridges, and culverts. Barn Swallow nests are cup-shaped and made of mud, typically attached to horizontal beams or vertical walls underneath an overhang (1).	Yes: on-site and adjacent lands	Confirmed absent through targeted surveys	No further consideration required
Black Tern	*Chlidonias niger*	No Status	SC	S3B	The Black Tern is a small waterbird with a forked tail, straight pointed bill, slender shape, and black head during breeding season. It builds floating nests in loose colonies in shallow marshes, with a preference for cattails. They breed primarily in the marshes along the edges of the Great Lakes, but may also use wetlands further north if suitable (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential significant wildlife habitat on-site
Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4B	The Bobolink is a mid-sized songbird of tan colour with black stripes, except for males during summer breeding season who are black with a white back and yellow collar. It prefers tall, grassy meadows, hayfields and some croplands, and feeds (largely on insects) on the ground in dense grasses (1). It tends to nest in forage crops: hayfields and pastures dominated by species including clover, bluegrass, and broadleaf plants (2).	No	Known to occur in the general area	No further consideration required
Canada Warbler	*Cardellina canadensis*	THR	SC	S4B	The Canada Warbler is a small songbird with bright yellow underparts and bluish-grey back and tail (1). It can be found in a variety of forest types, but is most abundant in moist, mixed forests with a well-developed, dense shrub layer. Nests are usually located on or near the ground on mossy logs, and along stream banks (3).	Yes: on-site and adjacent lands	Confirmed absent through targeted surveys	No further consideration required
Cerulean Warbler	*Setophaga cerulea*	END	THR	S3B	The Cerulean Warbler, a small songbird, is blue-green with white eyebrows and two prominent white wing bars (1). It requires relatively large tracts of mature deciduous forest (>100 ha), and nests in older, second-growth deciduous forests. During breeding season, it is found in relatively large tracts of mature deciduous forests that feature large, tall trees and an open understorey (4).	Yes: on-site and adjacent lands	Confirmed absent through targeted surveys	No further consideration required
Chimney Swift	*Chaetura pelagica*	THR	THR	S4B,S4N	The Chimney Swift is a small bird, between 12 and 14 cm, with a brown, cigar-shaped body, slender wings, and an erratic flight pattern. Prior to settlement, the Chimney Swift would mainly nest in cave walls and hollow trees. Now, it is found mostly near urban and suburban areas where the presence of chimneys or other manmade structures provide nesting and roosting habitat. They also tend to stay in habitat close to the water (1).	No	Confirmed absent through targeted surveys	No further consideration required

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Common Nighthawk	*Chordeiles minor*	THR	SC	S4B	The Common Nighthawk is a medium-sized bird with long, pointed wings, a long tail with a notch, and and large eyes. Its plumage of dark brown with black and white specks blends with its roost site. It is typically found in open areas such as gravel beaches, rock outcrops and burned woodlands, that have little to no ground vegetation. This species can also be found in highly disturbed locations such as clear cuts, mine tailing areas, cultivated fields, urban parks, gravel roads, and orchards (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential significant wildlife habitat on-site
Eastern Meadowlark	*Sturnella magna*	THR	THR	S4B	The Eastern Meadowlark is a medium-sized migratory songbird with a bright yellow throat and belly, a black V shape on its chest, and a pointed bill. It prefers pastures and hayfields, but is also found to breed in orchards, shrubby fields, human-use areas such as airports and roadsides, or other open areas. The Eastern Meadowlark can nest from early May to mid-August, in nests that are built on the ground and well-camouflaged with a roof woven from grasses (1).	No	Confirmed absent through targeted surveys	No further consideration required
Eastern Whip-poor-will	*Antrostomus vociferus*	THR	THR	S4B	The Eastern Whip-poor-will is a medium-sized bird with mottled brown and grey feathers to blend in with its surroundings, a large flattened head, and small bill. They are usually found in areas with a mix of open and forested areas such as patchy forests with clearings, forests that are regenerating after major disturbances, savannahs, open woodlands or openings in more mature forests. Breeding habitat is dependent on forest structure rather than composition, although common tree associations are pine and oak, and it nests directly on the forest floor (2). The species prefers to nest in semi-open or patchy forests with clearings as it forages in open areas and uses forested areas for roosting (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S4B	The Eastern Wood-pewee is a species of 'flycatcher', a bird that eats flying insects. It grows to approximately 15 cm, has greyish-olive upper parts and pale bars on its wings. This species lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It prefers intermediate-age forest stands with little understory vegetation (1). It typically creates nests on tree branches 2-12 m in height (2).	Yes: on-site and adjacent lands	Confirmed habitat on-site through targeted surveys	Potential significant wildlife habitat on-site
Evening Grosbeak	*Coccothraustes vespertinus*	No Status	SC	S4B	The Evening Grosbeak is a large songbird with a thick greenish bill. It is a social bird that is often found in flocks, particularly during the winter months. Their preferred habitat is thick coniferous forest. During their breeding season, they are generally found in open, mature mixed forests dominated by Firs, White Spruce, or Trembling Aspen (1).	No	Confirmed absent through targeted surveys	No further consideration required
Golden Winged Warbler	*Vermivora chrysoptera*	THR	SC	S4B	The Golden-winged Warbler is a small songbird with distinctive yellow wing patches and patches behind their eyes. It inhabits early successional habitat of old fields and favour areas where trees are spread out or forest edges to use for perching, singing, and searching for food. They seem to prefer regeneration zones with young shrub growth, surrounded by mature forest, locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas for their breeding sites; often frequenting clusters of herbaceous plants and low bushes (1).	No	Confirmed absent through targeted surveys	No further consideration required
Grasshopper Sparrow	*Ammodramus savannarum*	SC	SC	S4B	The Grasshopper Sparrow is a small songbird with a streaked back, a white stripe down the center of its crown, a flattish head, and a conical beak. It inhabits open grasslands and prairies with well-drained soil, preferring areas that are sparsely vegetated. It will also nest in hayfields and pastures, as well as alvars and occasionally grain crops such as barley (1).	No	Confirmed absent through targeted surveys	No further consideration required

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Least Bittern	*Ixobrychus exilis*	THR	THR	S4B	The Least Bittern is a small member of the heron family, reaching around 30 cm in length. It has brown and beige plumage with chestnut patches on its wings (1). The species nests in marshes (> 5 - 10 ha) and swamps dominated by emergent vegetation, preferably cattails, interspersed with patches of woody vegetation and open water. They require dense vegetation and open water with stable levels within 10 m for nesting, and access to clear, open water for foraging (4).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Loggerhead Shrike	*Lanius ludovicianus*	END	END	S2B	The Loggerhead Shrike is a small bird with a black, hooked bill, grey crown, and white throat and chest. This species has specific habitat requirements that are dependent on active livestock grazing, or grassland areas that have naturally short grass cover (i.e. alvar communities). They also require spiny, multi-branched shrubs, or barbed fencing, to catch prey. They prefer grassland habitats that have sporadic occurrences of low trees and shrubs; particularly hawthorn species, which are used as part of their feeding behaviour (1).	No	Confirmed absent through targeted surveys	No further consideration required
Olive-sided Flycatcher	*Contopus cooperi*	THR	SC	S4B	The Olive-sided Flycatcher is a medium-sized songbird with olive colouring, often seen perching on top of tall trees waiting to catch their prey. It prefers open areas along natural mature forest edges, forest edges near natural openings such as rivers or swamps, human-made openings, or burned forest openings with numbers of dead trees. Breeding habitat usually consists of coniferous or mixed forests adjacent to rivers or wetlands, in Ontario often nesting in White and Black Spruce, Jack Pine, and Balsam Fir (1).	Yes: on-site	Confirmed absent through targeted surveys	No further consideration required
Red-headed Woodpecker	*Melanerpes erythrocephalus*	THR	SC	S4B	The Red-headed Woodpecker is a mid-sized bird, at around 20 cm long, with a vivid red head, neck and breast as well a strong bill. The species can be found in open woodland and woodland edges, often near man-made landscapes such as parks, golf courses and cemeteries. These areas must contain a large number of dead trees for perching and nesting (1).	No	Confirmed absent through targeted surveys	No further consideration required
Short-eared owl	*Asio flammeus*	SC	SC	S2N,S4B	The Short-eared Owl has a large round head with small tufts of feathers, long wings, a short tail, and cryptic colouring of brown streaks. This species is found in scattered pockets across the province where suitable open habitat, including grasslands, tundra, peat bogs and marsh, can be found in sufficient quantities. Adults build nests on the ground in grassy areas and occasionally agriultural fields (1). The main factor influencing their choice in habitat is believed to be an abundance of their food source, primarily rodents and other small mammals (2).	No	Confirmed absent through targeted surveys	No further consideration required
Wood Thrush	*Hylocichla mustelina*	THR	SC	S4B	The Wood Thrush is a medium-sized songbird of around 20 cm with rusty brown coloured upper parts and white underparts with large dark spots. It breeds in deciduous and mixed forests with moderate understories, shade and abundant leaf litter where it forages for food, including larval and adult insects as well as plant material. They prefer moist stands of trees with well-developed undergrowth and tall trees for perches (1).	Yes: on-site and adjacent lands	Confirmed habitat on-site through targeted surveys	Confirmed significant wildlife habitat on-site
Herptiles								
Blanding's Turtle	*Emydoidea blandingii*	THR	THR	S3	Blanding's Turtles are identifiable by their bright yellow throat and chin and domed shell. They spend the majority of their life cycle in the aquatic environment, usually in large wetlands or shallow lakes with high densities of water plants (1). These turtles prefer shallow, nutrient rich water with organic sediment and dense vegetation. They use terrestrial sites for travel between habitat patches and to lay clutches of eggs, often going hundreds of meters from their nearest water body. Blanding's Turtles nest in dry coniferous and mixed forest habitats, as well as fields and roadsides (2). From late October until the end of April, they hibernate in the mud at the bottom of permanent water bodies (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal	Provincial		SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
		SARA	SARO	S-RANK				
Eastern Musk Turtle	*Sternotherus odoratus*	SC	SC	S3	The Eastern Musk Turtle is small with a narrow carapace, a dark brown body and two light stripes on each side of their head (5). It is a small freshwater turtle found primarily in slow moving water bodies with abundant emergent vegetation and mucky bottoms along the southern edge of the Canadian Shield within which they burrow into overwinter. Nesting sites vary, but must be close to the water and exposed to direct sunlight (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential significant wildlife habitat on-site
Midland Painted Turtle	*Chrysemys picta marginata*	SC	-	S4	The Midland Painted Turtle has a olive to black carapace with red or dark orange markings on the marginal scutes, as well as red and yellow stripes on the head and neck. The species uses a variety of waterbodies including, ponds, marshes, lakes and slow-moving creeks with a soft bottom and an abundance of basking sites and aquatic vegetation. This species usually hibernates on the bottom of waterbodies (5).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential significant wildlife habitat on-site
Northern Map Turtle	*Graptemys geographica*	SC	SC	S3	The Northern Map Turtle is a medium sized turtle identified by its carapace's map contour-like patterning. It lives in larger lakes and rivers, requiring high water quality to support their primary prey species: molluscs. This species can often be seen in large groups basking together on rocks and logs. In the winter, the Northern Map Turtle can be found hibernating on the bottom of slow-moving rivers (1).	No	Known to occur in the general area	No further consideration required
Snapping Turtle	*Chelydra serpentina*	SC	SC	S3	The Snapping Turtle, with its large serrated carapace, small plastron, and spiked tail, is Canada's largest freshwater turtle (5). It spends the majority of its life in water, preferring shallow water with soft mud and leaf litter, and will travel upland to gravel or sandy embankments, roadsides, along railway lines or beaches to lay their eggs (1).	Yes: on-site and adjacent lands	Potential habitat on adjacent lands through targeted surveys	Potential significant wildlife habitat on-site
Eastern Hog-nosed Snake	*Heterodon platirhinos*	THR	THR	S3	The Eastern Hog-nosed Snake can be a variety of colours and patterns so is most easily identified by its flattened, upturned nose. They prefer sandy well-drained habitats such as beaches and dry forests because they lay their eggs, hibernate and burrow in these areas. The main diet of this snake is toads and frogs, so they usually stay close to water including marshes and swamps, where they have an increased chance of finding their preferred prey (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Eastern Milksnake	*Lampropeltis triangulum*	SC	NAR	S4	The Eastern Milksnake's colouration is grey or tan with reddish alternating blotches otlines in black along its back and sides (5). It has recently been delisted from being a species at risk in Ontario (1). This species tends to use open habitats such as rocky outcrops, fields and forest edges. The preferred prey of milksnakes are mice, small rodents, and ground nesting birds which are amply found in and surrounding agricultural outbuildings. The milksnake is secretive and is not likely to be encountered during the day or at night while hunting (5).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential significant wildlife habitat on-site
Eastern Ribbonsnake	*Thamnophis sauritus*	SC	SC	S4	The Eastern Ribbonsnake is slender with three bright yellow stripes running down its back and sides and a white crescent in front of each eye. This snake is usually found close to water as they are strong swimmers, often fleeing predators by diving into shallow water. It prefers wetland habitats where its prey species, frogs and small fish, are abundant. Over winter, they congregate in underground burrows or rock crevices to hibernate (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential significant wildlife habitat on-site
Common Five-lined Skink (Southern Shield Population)	*Plestiodon fasciatus*	SC	SC	S3	The Common Five-lined Skink is Ontario's only lizard species. Its Southern Shield population can be found underneath rocks on open bedrock in forests and like to bask on sunny rocks and logs. They hibernate in crevices among rocks or buried in the soil (1). They hibernate in groups under rocks and tree stumps or in rotting wood (5).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential significant wildlife habitat on-site

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Western Chorus Frog	*Pseudacris triseriata*	THR	-	S3	The Western Chorus Frog is small with a dark stripe running through its eye and a light stripe underneath (5). It is primarily a lowland terrestrial species that requires access to terrestrial and aquatic habitats in close proximity to one another. Relying on marshes and wooded wetlands adjacent to forested habitats, this species also requires isolated, predator free pools for breeding. Temporary pools, such as vernal pools in wooded areas, are preferred. This species hibernates terrestrially in a variety of environments, including leaf litter, wood debris, and vacant animal burrows (2).	Yes: on-site and adjacent lands	Incidental observation on-site	Potential significant wildlife habitat on-site
Invertebrates								
Monarch Butterfly	*Danaus plexippus*	SC	SC	S2N,S4B	The Monarch is an orange and black butterfly with small white spots and a wingspan of around 10 cm. It relies on milkweed plants as a food source for growing caterpillars, but the adult butterflies forage in diverse habitats for nectar from wildflowers (1).	Yes: on-site and adjacent lands	Confirmed habitat on-site through targeted surveys	No further consideration required
Mottled Duskywing	*Erynnis martialis*	No Status	END	S2	The mottled duskywing is a medium-sized butterfly in the skipper family with a wingspan of 25-42 mm. It is dark grey with yellow-brown spots on its hind wings that give the species its mottled appearance and its name. The wings of freshly emerged adults have a purplish iridescence that fades with age. The mottled duskywing tends to live in dry habitats with sparse vegetation. These include open barrens, sandy patches among woodlands, and alvars. In Ontario, the mottled duskywing will only deposit their eggs on two closely-related plants: New Jersey tea and prairie redroot (1).	No	Known to occur in the general area	No further consideration required
West Virginia White	*Pieris virginiensis*	No Status	SC	S3	The West Viginia White is a small, dingy white butterfly. This species is found in moist deciduous woods, and requires a supply of toothwort, a small, spring-blooming plant, which provides the only source of food for its larvae. The West Virginia White is found mostly in the central and southern parts of Ontario, but its range extends north to Manitoulin and St. Joseph islands (1).	No	Known to occur in the general area	No further consideration required
Yellow-banded Bumble Bee	*Bombus terricola*	SC	SC	S3S5	The Yellow-banded Bumble Bee is a medium-sized bumble bee with a distinct yellow and black abdominal band pattern found on its queens, males, and workers. This species is a forage and habitat generalist, able to use a variety of nectaring plants and environmental conditions. It can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands and urban areas. The Yellow-banded Bumble Bee ranges from the Mixedwood Plains of southern Ontario to the Hudson Bay Lowlands in the north (1).	Yes: on-site	Known to occur in the general area	No further consideration required
Mammals								
Tri-colored Bat	*Perimyotis subflavus*	END	END	S3?	The Tri-colored Bat is small, with pale brown with orange-red forearms, muzzle, and ears. It is named for the black, yellow, and brown hairs on its back. It is considered rare in this region of Ontario which is at the northernmost limit of the natural range. These bats prefer to nest in foliage, tree cavities and woodpecker holes, but are occasionally found in buildings; though this is not their preferred habitat. Winter hibernation takes place in caves, mines and deep crevices. Tri-colored Bats prefer an open forest habitat type in proximity to water (6).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Eastern Small-footed Myotis	*Myotis leibii*	No Status	END	S2S3	The Eastern Small-footed Myotis has fur with black roots and shiny brown tips as well as very small feet. In the spring and summer, the Eastern Small-footed Myotis will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. They change their roosting locations daily and hunt at night for insects. They hibernate in winter, often in caves and abandoned mines choosing colder and drier sites than other similar bats (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Little Brown Myotis	*Myotis lucifugus*	END	END	S4	The Little Brown Myotis has glossy brown fur and a fleshy projection covering the entrance to its ears. This species roosts in trees and buildings, often selecting attics, abandoned buildings and barns for summer colonies where they can raise their young. Little Brown Bats hibernate from October/November to March/April, most often in caves or abandoned mines that are humid and remain above freezing (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Northern Myotis	*Myotis septentrionalis*	END	END	S3	The Northern Myotis has dull yellow-brown fur with pale bellies and long, rounded ears. This species is found in boreal forests, roosting under loose bark and in the cavities of trees. These bats hibernate from October/November to March/April, most often in caves or abandoned mines (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Algonquin Wolf	*Canis lycaon*	SC	THR	S4	Formerly called the Eastern Wolf, this canine was recently renamed the Algonquin Wolf. In the southern portion of the province, this species prefers deciduous and mixed forest landscapes while their northern range include mixed and coniferous forests. It is most prevalent in areas with abundant prey species which include Beaver, White-tailed Deer and Moose. Dens sites are usually found in coniferous forests with easily excavated soil types like sand and close to a permanent water source (1).	Yes: on-site and adjacent lands	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Trees, plants, fungi and lichens								
Butternut	*Juglans cinerea*	END	END	S2?	The Butternut is a medium sized tree reaching 30 m in height. It has large compound leaves with 11 to 17 leaflets. The fruit is oval, fuzzy and sticky. In Ontario, the Butternut prefers moist, well-drained soil, often along streams, or occasionally well-drained gravel sites. It grows alone or in small groups in deciduous forests (1).	No	Confirmed absent through targeted surveys	No further consideration required

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