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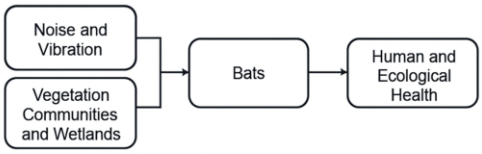
6.15 Bats

Little Brown and Northern Myotis are classified as Endangered bat species, both provincially and federally, and have been identified in and around the Project site. These species have experienced severe declines due to white-nose syndrome, a fungal disease that causes widespread mortality among cave hibernating bats. Endangered bat species in Ontario have specific individual and habitat protection under the provincial *Endangered Species Act, 2007* (ESA; S.O. 2007, c.6). Three additional species are proposed for addition to the ESA, including Hoary Bat, Silver-haired Bat, and Eastern Red Bat. These three additional species have also been confirmed as using the area around the Project. Bats have been selected as a valued component (VC) due to their potential interactions with the Project.

In the absence of mitigation, the assessment of potential changes to bats is directly linked to other VCs and is informed by the following sections:

- **Noise and Vibration (Section 6.3):** The assessment of the potential effects on noise includes changes in sensory disturbances during operation of the Project, which may affect bats.
- **Vegetation Communities and Wetlands (Section 6.11):** The assessment of potential effects on vegetation communities and wetlands includes changes in vegetation communities during construction (due to removal) and operation (changes in dust deposition and groundwater) of the Project and may affect the availability of habitat used by bats.



In addition, the assessment of potential changes to bats are also directly linked to other VCs, and informs the analysis of the following sections:

- **Human and Ecological Health (Section 6.24):** The assessment of potential changes in human and ecological health is informed by the health of wildlife species during construction and operation of the Project as this may affect the risk to ecological health due to changes in potential contaminants that could be ingested by bats.

The assessment of potential changes in bats from the Project are compared against relevant provincial and federal criteria (Section 6.15.1.4) and existing conditions (Section 6.15.2). The terrestrial resources technical support documentation is included in Appendix P, which includes the Baseline Terrestrial Report (Appendix P-1).

6.15.1 Assessment Approach

The approach to the assessment of potential effects on bats includes a description of the relevant regulatory and policy setting, a description of the input obtained through consultation specific to this VC, the identification of criteria and indicators along with the associated rationale, a description of the spatial and temporal boundaries used for this VC along with a description of the attributes used to determine the significance of any residual, adverse effects. The assessment of potential effects is supported by a description of the existing conditions for the VC (Section 6.15.2), the identification and description of applicable pathways of potential effects on the VC (Section 6.15.3) and a description of applicable mitigation measures for the VC (Section 6.15.4). An outline of the analytical methodology conducted for the

assessment and the key assumptions and/or conservative approach is found in Section 6.15.5. With the application of mitigation measures to the potential effects on the VC, the residual effects are then characterized in Section 6.15.6 and the significance of the residual effects is determined in Section 6.15.7.

6.15.1.1 Regulatory and Policy Setting

The effects assessment for bats has been prepared in accordance with the requirements of the federal Environmental Impact Statement (EIS) Guidelines (Appendix B-1) and the provincially approved Amended Terms of Reference (ToR; Appendix B-3). Concordance tables indicating where EIS Guidelines and ToR requirements have been addressed are provided in Appendix B-2 and B-5, respectively. Government policies, objectives, standards, or guidelines most relevant to the VC are summarized below.

Federal *Species at Risk Act*

The *Species at Risk Act* (SARA; S.C. 2002, c. 29) was passed into law in 2002 and was last amended on June 17, 2024. The SARA aims to prevent wildlife species in Canada from disappearing, to provide for the recovery of wildlife species and to manage species to prevent further risk to their status. SARA provides legal protection to species at risk (SAR) listed in Schedule 1 if they have a designation of Extirpated, Endangered, or Threatened with respect to harming the species or its residence. The SARA applies to federal lands (e.g., First Nations reserve lands) and outside of federal lands to migratory birds (i.e., those species listed under Article I of the *Migratory Birds Convention Act*, 1994 [S.C. 1994, c. 22]) that also fall under Schedule 1 of the SARA; this does not include the species' critical habitat but it does include residences of migratory birds that have residence descriptions; and aquatic species that fall under Schedule 1 of the SARA.

The majority of the Project is not located within federal lands. However, the application of SARA relative to bats has been considered for the portion of the transmission line that crosses Slate Falls Nation. SAR with Extirpated, Endangered, or Threatened federal designations require recovery strategies or conservation action plans that identify their critical habitat for mandatory prohibition from damage or destruction. Species listed as Special Concern in Schedule 1 are not legally protected under SARA but require a management plan. Species listed in Schedule 2 or 3 of SARA are not legally protected under SARA. Still, they require status assessment through the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) to determine conservation status and priority for recovery and action planning. Notably, SARA prohibitions can be applied if provincial legislation or voluntary measures do not adequately protect federally listed species and their residence. Generally, compliance with provincial legislation in Ontario satisfies the SARA requirements.

Little Brown Myotis and Northern Myotis (both endangered on Schedule 1) share a recovery strategy which partially identifies critical habitat (ECCC 2018). In addition, Hoary Bat, Silver-haired Bat, and Eastern Red Bat were designated as Endangered by COSEWIC in May 2023. The designation by COSEWIC indicates future inclusion under the protection of the federal SARA and potential protection under the ESA. A recovery strategy has yet to be developed for the Hoary Bat, Silver-haired Bat, and Eastern Red Bat.

To meet the requirements of Section 79 of SARA, the potential adverse effects to the listed species or its critical habitat are to be identified, and mitigation measures consistent with any applicable recovery strategy and action plans must be described during the environmental assessment. The proponent must identify the project's adverse effects on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and monitor them. Environment and Climate Change Canada (ECCC), formerly Environment Canada, must be notified of impacts to listed species or its critical habitat.

Provincial *Endangered Species Act*

Ontario's ESA was passed into law in 2007 and came into effect on June 30, 2008, and was last amended on July 21, 2024. The ESA is administered by the Ministry of the Environment, Conservation and Parks (MECP); however, SAR are determined by the Committee on the Status of Species at Risk in Ontario. If a species is listed under the ESA as Extirpated, Endangered, or Threatened, Section 9 of the ESA prohibits killing, harming, harassing, capturing, taking, possessing, collecting, buying, selling, leasing, trading, or offering to buy, sell, lease or trade a member of the species. Similarly, Section 10 of the ESA prohibits the damage or destruction of the habitat of all Endangered and Threatened species. Protection under the ESA extends to both public and private lands. Species listed as Special Concern are not afforded protection under Sections 9 and 10 of the ESA.

Under the ESA, habitat is defined as the area prescribed by regulation ("Regulated Habitat") or generally ("General Habitat") as an area on which the species depends, directly or indirectly, to carry on its life processes (e.g., reproduction, rearing, hibernation, migration, feeding). General Habitat is further defined for some species through the development of technical General Habitat Descriptions which provide greater clarity on the area of habitat protected for a species.

Impacts on individual SAR and/or their habitats are considered a contravention of the ESA. Under certain circumstances, tools authorized under the ESA (e.g., permit, agreement, instrument) can be applied to allow activities that would otherwise be prohibited by the ESA. Requirements for achieving compliance with the ESA through permit, agreement, or instrument often include confirmation that the activity will not jeopardize the survival or recovery of the species in Ontario, that reasonable steps are taken to minimize the adverse effects, that reasonable alternatives have been considered, and that beneficial actions achieved would outweigh adverse effects.

Any SAR ranked as Endangered or Threatened that may be impacted by any Project work requires consideration. There are two bat species known to occur in the baseline investigation area of the Project that are designated as Endangered under the ESA, Little Brown Myotis and Northern Myotis. Three additional bat species known to occur in the baseline investigation area of the Project, Hoary Bat, Silver-haired Bat and Eastern Red Bat, have recently been designated as Endangered by the Committee on the Status of Species at Risk in Ontario. As a result, these three species may be designated under the ESA during the life of the mine. The provincial recovery strategy for bats adopts the federal recovery strategy and exists as a combined document for the Little Brown Myotis Northern Myotis (Humphrey and Fotherby 2019). This recovery strategy identified bat critical habitat as any maternity roosting habitat or hibernaculum and its associated foraging habitat.

Provincial *Fish and Wildlife Conservation Act*

The *Fish and Wildlife Conservation Act* (FWCA; S.O. 1997, c.41) was passed into law in 1997 and was last amended on June 8, 2024, and is administered by the Ministry of Natural Resources (MNR). The FWCA applies to "fish and wildlife" whereby fish are defined as having the same meaning as in the *Fisheries Act*, and wildlife are defined as "an animal that belongs to a species that is wild by nature and includes game wildlife and specially protected wildlife." Bats in Ontario are considered "specially protected wildlife," as identified within Schedules 6 to 11 under the FWCA O. Reg. 669/98: Wildlife Schedules, and are protected from being killed, trapped, or hunted. If wildlife requires collection or relocation at any point in the Project (i.e., through trapping / collection and relocation), a permit or approval under the FWCA may be required. If a provision of the FWCA and a provision of the ESA conflict, the provision that gives the most protection prevails.

6.15.1.2 Influence of Consultation with Indigenous Communities, Government and the Public

Consultation has been ongoing for several years, prior to and throughout the environmental assessment process, and will continue with Indigenous communities, government agencies and the public through the life of the Project. Section 2 provides more detail on the consultation process. The Record of Consultation (Appendix D) includes detailed comments received and responses provided during the development of the final EIS/EA.

Feedback received through consultation has been addressed through direct responses (in writing and follow-up meetings) and incorporated in the final EIS/EA, as appropriate. The key comments that influenced the assessment for bats between the draft and final EIS/EA are provided below.

Baseline Information

The Impact Assessment Agency of Canada (IAAC) and the Ministry of Natural Resources (MNR) requested further details on the methodologies employed for the surveys and search for candidate bat hibernaculum sites. Further, the figures requested by IAAC and the MNR show confirmed and candidate hibernacula sites, including those assessed in 2022. The methods used to search for candidate bat hibernaculum sites included an initial desktop geographic information system (GIS) exercise to identify areas with potential karst geology (with the Ontario bedrock via the OGSearth database), any abandoned mine sites or features and cliff-like topography. Based on the identification of these candidate sites, field visits were conducted by trained biologists and involved moving outward in a circular pattern to find the mapped feature. Once biologists were confident the location had been reasonably examined, the investigation was concluded for that location. Potential cliff features mapped during the desktop exercise or encountered in the field were examined for suitability as a bat hibernaculum. Openings and cracks were examined and documented (length, depth). An autonomous recording unit was placed at the opening to record bats in the spring or fall for features greater than 1 metre (m) deep with the potential to hold suitable thermoregulatory microclimates for wintering bats. The locations of the candidate hibernacula sites are provided in Figure 3-25 of the Baseline Terrestrial Report (Appendix P-1) and include those candidate hibernacula sites that were assessed in 2022. Over 312,000 bat recordings were obtained and spanned two maternity, one spring emergence and two swarming / mating seasons within the Local Study Area (LSA) and Regional Study Area (RSA). Further details on methodologies used for bat surveys, along with the results of additional hibernacula assessments (including autonomous recording unit deployment) undertaken in 2022 and 2023, are included in the baseline terrestrial report (Appendix P-1).

MECP recommended using updated forest resource inventories (FRI) from both the Trout and Lac Seul Forests to identify potential habitat for SAR birds and bats. Updated 2021 FRI data from the Caribou, Cat Lake, Lac Seul, Trout Lake Forest Management Units was provided by MNR in 2023 and was incorporated into the analysis of habitat, as described below in Section 6.15.5 and the Baseline Terrestrial Resources Report (Appendix P-1).

MECP requested a description of the weather conditions when acoustic recording units were deployed to collect baseline data for bats, to determine the suitability of the data. The average weather was calculated across the three stations to quantify the number of days when weather was favourable to bat activity (i.e., nights with temperatures above 10°C, no rain greater than 5 mm and low winds). The weather conditions observed during the 2021, 2022 and 2023 field programs is detailed in Section 3.5 of the Baseline Terrestrial Resources Report (Appendix P-1).

MECP recommended identifying maternal roost habitat using ecosite type to serve as an indicator to quantify the potential effects. As described in Section 3.5.1 of the Baseline Terrestrial Resources Report (Appendix P-1), snag surveys conducted for the Project on maternity roosting habitat include deciduous forests, as well as mixed forests. The ecosites surveyed in 2021, 2022 and 2023 included B024, B034, B049, B050, B052, B055, B065, B070, B088, B104, B119, B127, B128, and B140. The average snag density within all but three of these ecosites was well above 20 snags per hectare (ha). The remaining three (B088, B127, and B140) had average cavity tree densities of 20 snags per hectare. This indicates that most deciduous or mixed forests in the investigation area have sufficient cavities to support bat maternity roosts. The sampling strategy has resulted in a suitable sampling effort at targeted ecosites and additional suitable ecosites. Most identified potential bat roosting features were in a Poplar species (64 percent [%] of identified tree species) followed by Spruce (20% of identified tree species) and Birch (12% of identified tree species), with lower numbers in Pine and Fir species. While deciduous trees expectedly occupied most of the identified potential cavity trees (74%), coniferous trees still composed a substantial portion of the identified suitable cavity trees (26%). Acoustic surveys indicate that bats occur in all habitats in the RSA, and these results suggest that most areas within the RSA, including coniferous forests, provide suitable maternity-roosting habitat. The range of ecosites identified as harbouring suitable roost tree densities spanned multiple forest types, including coniferous, deciduous / mixed, coniferous swamp and sparse treed forests. As such, all forested ecosites were mapped as bat maternity habitat.

Assessment Methods

MNR requested further clarification on the study area used for the assessment of indirect effects on bats. The LSA is intended to capture potential direct effects from the Project (such as habitat loss) and indirect effects (such as sensory disturbance) resulting from the Project. Direct effects could occur only within the Project Development Area (PDA); however, indirect effects could extend beyond the PDA. As a result, the LSA will be considered instead of a zone of influence. This has been clarified in Section 6.15.1.3.

Potential Effects

MNR requested further analysis of the effects on food sources for bats that may be linked to the loss of aquatic habitat that supports aerial insects with an aquatic larval stage. Section 6.15.6 below provides an assessment of the direct loss and indirect effects on foraging habitat for SAR bats. Given the relatively small area of foraging habitat directly lost (0.4% of the RSA) and the availability of alternative foraging habitat adjacent to the Project, residual effects on foraging habitat are not predicted.

Mitigation Measures

IAAC requested an explanation for how tree clearing in areas with known or potential roosting habitat between April 15 and May 15 and between July 31 and August 31 will avoid adverse effects on Little Brown Myotis and/or Northern Myotis. The timing window for vegetation clearing to avoid potential indirect effects on roosting SAR bats has been updated to April 15 to August 31, to correspond with the timing of emergence from hibernation and the maternity period. This has been included in Section 6.15.4.

IAAC requested further details of the mitigation measures for the potential loss of hibernation habitat proposed in the draft EIS/EA. Where hibernaculum have been identified, the foraging resources within 2.6 kilometres (km) of the feature have been considered habitat associated with the hibernaculum. The removal / disturbance of this habitat will be avoided during construction, to the extent possible. However, if avoidance is not possible, the removal of foraging habitat associated with hibernacula will be limited to the period between May 15 and July 31 or as otherwise determined in consultation with ECCC and the MECP. Noise will be limited within 500 m of the identified hibernaculum entrance. If there is a residual loss

of foraging habitat associated with a confirmed hibernaculum, this will be compensated, as required by the provincial ESA, using measures such as the installation and monitoring of bat houses, conservation / protection of adjacent habitat, progressive and long-term remediation / rehabilitation. If an identified hibernaculum must be removed, the removal of the hibernaculum will be limited to the summer months when bats are not hibernating while avoiding the removal of trees during this period. If compensation is required under the ESA for residual impacts, measures such as constructing a new wintering habitat will be used. The details of these mitigation measures are included below in Section 6.15.4.

MNR requested that mitigation for bats should consider a set back distance around potential hibernacula, as opposed to relying upon confirmation of hibernacula. A set back distance of 200 m around potential hibernacula has been included as a mitigation measure in this assessment.

Cat Lake First Nation and Lac Seul First Nation requested clarification on the timing of construction works relative to the maternity roosting habitat. Mitigation will include avoiding Project construction activities during the bat active season to the extent feasible and minimizing habitat loss as well as indirect effects on bat habitat, as described in Section 6.15.4.

Assessment of Residual Effects

IAAC requested additional information regarding the mitigation measures that will be in place to minimize the loss of maternity roosting habitat within the PDA during construction will have a low magnitude effect on SAR bats. The development of the Project will remove 0.4% of the available bat roosting habitat and 0.2% of the available foraging habitat in the RSA. As a result, the magnitude of the residual effect is low (Level I) as the effect is not likely to change the abundance and/or distribution of SAR bats or their habitat, and monitoring is proposed to confirm the prediction. In addition, mitigation measures will be implemented, which will include maintaining uncleared buffers adjacent to sensitive bat habitat, minimizing vegetation removal along corridors, and undertaking progressive rehabilitation. The mitigation measures are updated and described in Section 6.15.4.

Characterization of Residual Effects

IAAC requested scientific evidence to support the evaluation of the ecological context for residual effects on bats. The assessment of potential bat maternity habitat shows there is an abundance of suitable bat maternity habitat in the RSA, meaning there are likely sufficient alternate roosting sites available. Despite this, the effect of tree clearing on bat population sizes may be variable since population sizes are difficult to estimate, and bat activity can increase after clearing due to increased suitable edge foraging habitat. "Roost exclusion studies suggest that exclusion from permanent structures can decrease site fidelity, alter home range size, lower reproductive recruitment, and reduce colony size and the strength of association among individuals" (Silvis et al. 2015a). However, removing roosts at a small scale has shown no effect on the distribution and roost selection of Northern Myotis but Little Brown Myotis that change roosts less often may be less resilient (Silvis et al. 2015a). Based on the results of the 2022 survey, the assessment of potential effects on SAR bats has been updated in Section 6.15.6 and the characterization of residual effects has been clarified.

Mishkeegogamang Ojibway Nation requested further information on the potential effects of the loss of candidate hibernaculum on bats. Baseline studies conducted in 2023 confirmed that there is no hibernaculum in the PDA; therefore, the effects of this potential loss were not required. As a result, the assessment of potential direct effects on bat habitat has been updated in Section 6.15.6.1.

The MECP requested the conclusions on residual effects be re-evaluated once updated FRI has been obtained, specifically related to maternal habitat for bats. Section 6.15.6.1 includes updated calculations of

maternity roosting habitat and a re-evaluation of the changes in the amount of this habitat to support the determination of significance. As a result, there is less than a 1% direct loss of maternity roosting habitat in the RSA, and there is a sufficient amount of suitable habitat to support roosting throughout the RSA.

6.15.1.3 Spatial and Temporal Boundaries

The Project Development Area (PDA) is defined as the footprint of the Project, including the mine site, mine access road, and the transmission line corridor, as well as a buffer to allow for flexibility for design optimizations during Project permitting. The buffer includes approximately 250 metres (m) around the mine site area. The buffer is included within the 40 m wide corridor for the transmission line and the 30 m wide corridor for the mine access road. Where the mine access road and transmission line are aligned together, the buffer is included within a 60 m wide corridor.

The spatial boundaries used for the assessment of bats are shown in Figure 6.15-1 and defined as follows:

- **Local Study Area (LSA):** The LSA consists of a 2 km buffer around the mine site area of the PDA, a 2 km buffer from the centreline of the mine access road of the PDA, and a 1 km buffer from the centreline of the transmission line. The LSA includes the outer extent to which potential direct and indirect effects are anticipated to occur. The direct effects include anticipated areas of bat habitat that may be overprinted. Areas adjacent to the PDA may experience indirect effects as result of a change in function, connectivity and quality. The predicted indirect effects are measured within a zone of influence, which is the area between the spatial footprint of an activity and the extent of the activity's effects on the surrounding habitat (Wilson 2016). The indirect effects are based on the zone of influence associated with the changes due to the following:
    - The groundwater drawdown (Figure 6.15-2);
    - The extent of the modelled air emissions (Figure 6.15-3); and
    - The extent of the modelled noise emissions (Figure 6.15-4).
- **Regional Study Area (RSA):** The RSA includes the combination of quaternary watershed boundaries that may be influenced by the Project and is based on guidance outlined by ECCC to define an ecologically relevant study area. The extent of the RSA considers patterns in land cover where assemblages of vegetation and wetlands occur with distinct environmental conditions, relevant eco-districts and Bird Conservation Regions, and traditional knowledge from local Indigenous communities.

The temporal boundaries for the assessment are defined as:

- **Construction Phase:** Years -3 to -1, representing the construction period for the Project.
- **Operation Phase:** Years 1 to 10, with the first year potentially representing a partial year as the Project transitions from construction into operation. Mining of the ore from the open pit will end in Year 10, at which time the pit will begin refilling with water.
- Decommissioning and Closure Phase:
    - Active Closure: Years 11 to 15, when final decommissioning and the majority of active reclamation activities are carried out; and,
    - Post-Closure: Years 16+, corresponding to the post-closure monitoring period when the filled open pit basin will be reconnected to Springpole Lake.

Effects on each VC are assessed for each Project phase (i.e., construction, operation and closure).

6.15.1.4 Criteria and Indicators

In undertaking the assessment of effects on bats, the following criteria were used:

- Change in habitat;
- Change in the function, connectivity, and quality of habitat; and
- Change in risk of mortality.

The specific criteria, measurable indicators and the rationale for the selection of criteria are described in

Table 6.15-1: Bat Criteria, Indicators, and Rationale

. To support the effects assessment, indicators are assessed using professional judgement and experience.

6.15.1.5 Description of Residual Effect Attributes

Residual effects for bats are characterized in terms of the following attributes:

- Magnitude;
- Geographic extent;
- Duration;
- Frequency;
- Reversibility; and
- Timing.

These attributes along with the rankings are further described in Table 6.15-2.

In addition, the residual effects for bats are characterized according to the ecological context within which the VC is found. This is a qualitative measure of the sensitivity and/or resilience of the VC to potential change. The following ranking is applicable:

- **Level I:** The VC may or may not be sensitive but is capable of supporting the predicted change with typical mitigation measures.
- **Level II:** The VC is sensitive and requires special measures to support the predicted change.
- **Level III:** The VC is sensitive and unable to support the predicted change even with special measures.

As noted in Section 6.1, a residual effect is defined as significant if both of the following criteria are satisfied:

- A Level II or III rating is attained for all of the attributes involving magnitude, extent, duration, frequency, reversibility and timing; and
- A Level II or III rating is attained for ecological and/or social context.

Conversely, if a Level I rating is achieved for any of the attributes involving magnitude, extent, duration, frequency, reversibility and timing; or, if a Level I rating is achieved for the ecological contexts, then the residual effect is considered to be not significant.

In the event there is a significant adverse effect, the likelihood of occurrence is further described.

6.15.2 Existing Conditions

A description of the baseline conditions is presented below to characterize the existing conditions for bats and is based on three years of study that has resulted in a comprehensive dataset for this stage of project planning. The existing conditions are used to support the assessment of potential effects from the Project on bats and will support long-term monitoring for the Project. Further baseline information on terrestrial resources can be found in the technical support documentation (Appendix P) includes baseline data from field investigation conducted on bats.

Road networks associated with logging and the Slate Falls community are present in the southwestern and southeastern parts of the RSA. The E1C and Wataynikaneyap Power transmission line corridors run east to

west across the RSA. The area is also located within the Trout Lake, Lac Seul and Cat Lake Forest Management Unit FRI.

Bat Maternity Habitat

Surveys to identify suitable bat maternity roosting habitat for SAR bats were conducted from August 26 to September 7, 2021, June 5 to July 8, 2022, and May 25 to 29, 2023. Far North Land Class data were used to target areas of mature-growth deciduous / mixed wood stands or old-growth deciduous / mixed wood stands. FRI data were used to target ecosites identified by the MECP (2021) as providing suitable maternity roosting habitat for bats including ecosites B015-019, B023-028, B039-043, B054-059, B069-076, B087-092, B103-108, B118-125, and B130-133. Additional ecosites comprising forested habitat (deciduous, mixed, or coniferous) were also targeted if they were deemed potentially suitable through ground surveys. A total of 167 survey plots were completed across the LSA and the RSA.

In July 2022, a visual assessment of the existing exploration camp buildings was also undertaken for evidence of potential bat maternity roosting. The evaluated buildings included the kitchen, the core shack, the geology shack, the workshop, the office, and any other wooden or metal buildings.

Acoustic surveys were conducted to confirm the presence and use of the surveyed maternity roosting habitat by bats (Figure 6.15-5). In 2021, 37 bat detectors were deployed at 19 sites during the maternity period. During the first round of recording, pairs of detectors were placed at 11 sites from May 31 to June 10, 2021. During a second round of recording, all detectors except four were moved and re-deployed in pairs at eight new sites from June 8 to 29. The four detectors that were not moved were left to continue recording at their original sites. In 2022, 37 bat detectors were deployed, of which 15 were deployed at sites (one per site) from 2021, and the remaining 22 were deployed at new sites not surveyed in 2021. Similar to 2021, bat detectors were deployed in two rounds and moved between rounds to improve coverage. Single bat detectors were also deployed for two nights, on July 6 and 7, along with in-person exit surveys to monitor five openings identified in exploration camp buildings that bats could use. In 2023, single bat detectors were deployed at 26 survey sites, of which four were from 2021 and not re-surveyed in 2022, and eight were from 2022. The location of the bat maternity habitat is shown in Figure 6.15-6.

Bat Hibernacula

Potential hibernacula were first identified through a GIS investigation of abandoned mines in Ontario using the Abandoned Mines Information System, as well as topography, bedrock geology, ground surveys and incidental aerial observations. Abandoned mines and potentially suitable geological formations identified through desktop investigations were located in the field and evaluated for features that could serve as overwintering habitat for bats. For cliffs, features that were considered potentially suitable were those that were at least 1 m deep with the potential to hold suitable thermoregulatory microclimates for wintering bats. For abandoned mines, once biologists arrived at the Abandoned Mines Information System coordinate, they searched for the mine by moving outward from the system coordinate in a circular pattern up to a radius of 500 m. Nine Abandoned Mines Information System mine features were identified in the RSA (M1 to M9). Three of these, M4, M7, and M8, could not be found, and two other sites, M1 and M9, were unsuitable for bats, as they lacked deep cracks or openings that bats could use. Six cliffs or rock outcroppings (Cliff 1 to Cliff 6) were identified during ground and aerial surveys, of which four contained features that were potentially suitable for bat hibernation (Cliff 1, Cliff 2, Cliff 3, and Cliff 6).

To confirm use of the potentially suitable abandoned mine and cliff sites as hibernacula by bats, acoustic bat surveys were conducted to capture fall swarming and spring emergence activity. In 2021, swarming activity was surveyed from August 27 to September 6, 2021. Eight bat detectors were deployed at the four

candidate abandoned mine sites and 11 detectors were deployed at the four candidate cliff sites to capture swarming activity. Additionally, four bat detectors were placed within 20 to 100 m of the features to serve as control sites for the potential hibernacula to more accurately evaluate the use of the features by hibernating bats. At one of these control sites (Cliff 1-control), the detector malfunctioned and no data could be collected. In 2022, bat detectors were re-deployed at the 2021 sites from May 4 to June 5, 2022 (three detectors monitored until the end of June), including five additional bat detectors along Cliff 1 and three additional control sites to capture bats potentially emerging from candidate hibernacula. Surveys at each feature also included active listening for five minutes with a heterodyne bat detector (Mini-3 Bat Detector, Ultra Sound Advice) tuned to 40 kHz and, where possible, a visual examination for hibernating bats within each feature with a high-intensity flashlight. To avoid disturbing any potentially hibernating bats, active surveys at each feature were kept brief (10 minutes maximum), and biologists did not touch or enter any feature. Data collected in 2021 and 2022 were sufficient to disqualify sites Cliff 2, Cliff 3 and M2 as bat hibernacula so these sites were not surveyed in 2023. Candidate hibernacula surveys in 2023 included the addition of four new control sites, three sites at Cliff 1 (Cliff 1-control2, Cliff 1-control3, and Cliff 1-control 4) and one site at Cliff 6 (Cliff 6-control2). One of the new sites, Cliff 1-control3, malfunctioned and produced no data—all other sites functioned as expected. In 2023, candidate hibernacula surveys aimed to obtain a more complete picture of seasonal activity trends to allow detection of any seasonal changes in activity that might result from bats swarming at the candidate hibernacula. To achieve this, bat acoustic monitoring at the candidate hibernacula ran from July 15 to September 25, 2023, which allowed for detecting any relative peaks in bat activity during the pre-hibernation period that could result from bat swarming activity.

Finally, two trail cameras were deployed from July 15 to October 2, 2023, facing Cliff 6 and M3 to capture bats potentially entering or exiting the potential hibernacula. The cameras were selected for their high trigger speed, long infrared range, high-definition, and high-frame-rate videos. One camera was deployed at the entrance of Cliff 6, and one was deployed at the entrance of M3.

Several lines of evidence were used to assess swarming activity and use of potential hibernacula:

1) Activity of hibernating bat species was predicted to be higher at potential hibernacula compared to control sites.

2) Activity of hibernating bat species was predicted to be higher than that of non-hibernating species as the former would be expected to pass near the detector much more frequently. Conversely, the activity of hibernating species at detectors not located at a hibernaculum, including control sites, was expected to be lower or equal to that of non-hibernating species. A general linear model was used to compare the average activity (passes/hr) of high-frequency species to that of low-frequency species at each site.

3) During the swarming period before the onset of hibernation, bats that hibernate generally continue to use summer roosts and regularly commute to hibernacula to swarm. These commutes can extend up to 12 km or more (Lowe 2012; Parsons et al. 2006). Therefore, hourly bat activity at swarming sites in late summer / fall was expected to begin low and increase throughout the start of the night, peak in the middle of the night and gradually decrease through the end of the night as bats return to their day roosts (Parsons et al. 2006). Although no published records exist describing patterns of hourly bat activity during spring emergence from hibernacula, hourly bat activity may be expected to begin earlier compared to control sites. Figures of hourly activity were examined for such a pattern.

4) Finally, the longer monitoring period at candidate hibernacula in 2023, which ran from mid-July to late September, allowed for detecting any relative peaks in bat activity during the pre-hibernation period that could result from bat swarming activity. The activity of bats was plotted against night and examined

for either higher relative activity at candidate hibernacula during late summer / fall compared to mid-summer or any significant peaks in activity during the late summer / fall period that may coincide with bat swarming behaviour.

Although each of the patterns of activity described above may suggest the presence of a hibernaculum, individually, they do not. For example, optimal foraging habitat may result in activity peaks at a site. Although these hypotheses have not been empirically tested, when considered together, they offer a means to identify sites with a relatively high likelihood of being true hibernacula. The locations of the potential bat hibernacula are shown in Figure 6.15-7. No hibernacula sites are situated within the PDA.

6.15.2.1 Little Brown Myotis

Little Brown Myotis are classified as endangered federally and provincially in response to dramatic declines in bat populations due to White Nose Syndrome (WNS; Hoyt et al. 2021). The federal and provincial recovery strategies (ECCC 2018; Humphrey and Fotherby 2019) for the Little Brown Myotis consider maternity habitat to include any detected maternity roost site and associated foraging resources. The limits for maternity habitat should include the contiguous ecosite where roosting females were observed between May 15 and July 31 and any area that bats may utilize within 2.4 km of the maternity site boundary (Humphrey and Fotherby 2019). The Recovery Strategy for the Little Brown Myotis recommends that any foraging and roosting habitat within 2.6 km of the hibernaculum or swarming site also be designated (Humphrey and Fotherby 2019).

Fieldwork surveys completed in 2012, 2018, and 2019 detected the presence of Little Brown Myotis (Appendix P-1). Surveys conducted from 2021 to 2023 concluded that all surveyed deciduous, mixed, and coniferous forest ecosites in the investigation area have sufficient densities (greater than or equal to 10 trees/ha) of suitable cavity trees to support bat maternity roosts (Table 6.15-3). Most identified potential bat roosting features were in a poplar species (64% of identified tree species) followed by spruce (20% of identified tree species) then birch (12% of identified tree species), with lower numbers in pine and fir species. While deciduous trees expectedly occupied most of the identified potential cavity trees (74%), coniferous trees still made up a significant portion of the identified suitable cavity trees (26%). Echolocation calls of Little Brown Myotis (calls classified as "Little Brown Myotis" or "Unknown Myotis") were recorded at every survey station in 2021 with the exception of survey station B28, located approximately 10 km south of Springpole Lake, west side of the PDA. This species was also recorded at all survey stations in 2022 and 2023.

Acoustic surveys were conducted in 2022 at buildings in the existing exploration camp with the potential to serve as maternity roosts for SAR bats. The activity of SAR bats at the entrance of maternity roosts in anthropogenic structures should be relatively high and should be expected to be higher than that of species that do not form maternity roosts in buildings (i.e., Silver-haired Bat and Hoary Bat). The activity of SAR bats at the four monitored candidate buildings was very low. A single unknown Myotis recording was obtained at sites 'camp bat 2, 3, and 5'. Seventeen Myotis passes were recorded at site 'camp bat 1', and no SAR bats were recorded at site 'camp bat 4' (Figure 6.15-8). All above SAR bat detections at the existing camp buildings occurred in the middle of the night. Conversely, each of these locations saw between 1,200 and 2,250 passes by low-frequency species, of which the majority were by Hoary Bat. These results confirm that bats are not roosting in the existing accommodations complex buildings.

In 2021, 15 candidate hibernacula sites were surveyed to assess their suitability for hibernating bats (Figure 6.15-7). Three of these sites, M4, M7, and M8, could not be found despite a thorough search and four other sites, M1, M9, Cliff4 and Cliff5, were visually determined to be unsuitable for bats. Acoustic surveys were conducted at the remaining eight sites: M2, M3, M5, M6, Cliff1, Cliff2, Cliff3, and Cliff6. Based on acoustic

surveys in late summer / fall 2021 and spring 2022, three sites were ruled out as hibernacula: M2, Cliff2, and Cliff3. The activity of hibernating species at these sites was very low and did not differ from that at control sites or that of non-hibernating species (Figure 6.15-9). Additionally, patterns of hourly activity at these sites were inconsistent with predictions for swarming (fall) or emerging (spring) bats (See Figure 6.15-10, Figure 6.15-11, Figure 6.15-12 and Figure 6.15-13) for average hourly activity throughout the night at each monitoring station for each species).

Additional data collected in 2023 provided sufficient evidence to rule out Cliff 6 as a hibernaculum. During fall 2021, the activity of hibernating bat species at both Cliff 6 and its control was identical and half that of non-hibernating species. Additionally, the activity of hibernating species was highest during the first two hours of the night, which was contrary to predictions for the activity of swarming bats. A second smaller activity peak was observed during the last hour of the night at the Cliff 6 control site (Cliff 6 – control), which may indicate the presence of a day roost in the vicinity of this site. This site is located approximately 200 m from the largest tract of old-growth mixed / deciduous forest to intersect the PDA. During spring 2022, the activity of hibernating- and non-hibernating bats at Cliff 6 and its control were relatively low and had identical distributions. Activity levels at Cliff 6 during the spring and fall were similar to each other, which is contrary to the pattern of bat activity observed at the Renfrew hibernaculum in Ontario, where 10 times more activity was observed during fall swarming than during spring emergence (Adams et al. 2015; Figure 6.15-9). During 2023, the activity of hibernating species in the fall at Cliff 6 was relatively low, equivalent to that at both its control sites (a second control was added in 2023), and never surpassed that of non-hibernating species. Additionally, activity at Cliff 6 and its controls essentially stopped as of August 22 while hibernating species were still active at other monitored sites in the Project until August 31 and, in the case of Cliff 1, well into September (Figure 6.15-9). Finally, the trail camera at Cliff 6 deployed during August and September 2023 did not record any bats. Based on the above combined evidence from acoustic and camera data, it was confidently determined that Cliff 6 was not a hibernaculum.

The remaining candidate hibernacula, Cliff 1, M3, M5, and M6, had much higher activity levels of hibernating species and patterns of activity more closely resembled those predicted for swarming bats. Cliff 1 is the cliff along the north shore of Springpole Lake. The three other sites, M3, M5, and M6, features of the same historical mine site, are located more than 8 km north of the PDA and are unlikely to be affected by mine activities.

6.15.2.2 Northern Myotis

The Northern Myotis is classified as endangered federally and provincially in response to dramatic declines in bat populations due to White Nose Syndrome (WNS; Hoyt et al. 2021). Northern Myotis is a widespread species in Canada with preferred habitat scattered throughout the RSA. The Recovery Strategy for the Northern Myotis considers maternity habitat to include any detected maternity roost site and associated foraging resources. The limits for maternity habitat should include the contiguous ecosite where roosting females were observed between May 15 and July 31, and any foraging area within 500 m of the maternity site boundary (Humphrey and Fotherby 2019).

Habitat assessments conducted within the investigation area determined there is suitable maternity roosting habitat. All surveyed mixed, deciduous, and coniferous forests provided suitable densities of cavity trees for maternal roosting bats. Suitable maternity roosting habitat for Northern Myotis is considered to be the same as that for Little Brown Myotis. Northern Myotis was detected at five of six acoustic survey locations in 2012, however, software used for species identification may have misclassified the species. To address potential misclassification, subsequent surveys were conducted to confirm the species presence. These follow-up surveys targeted preferred habitat and expert verification. Northern Myotis was confirmed

at two acoustic stations in 2022 (C20, C23) from manual vetting of recordings (Figure 6.15-6). Northern Myotis is likely much more prevalent than the data suggest despite the scarcity of confirmatory recordings of this species. This species is less likely to be detected in its preferred habitat as the higher frequencies that distinguish it from the Little Brown Myotis attenuate and scatter more readily in forest-covered areas. A conservative approach has been taken in this assessment and assumed that Northern Myotis is present in all forested habitats.

6.15.2.3 Tricolored Bat

As expected, the Tricolored Bat was not identified in the baseline investigation area. Published results from a comprehensive bat monitoring program across Northern Ontario (Layng et al. 2019) have led to speculation that Tricolored Bats may occur further west than originally thought. However, conclusions from this study are based on 5 of over 7,000 bat recordings, and all five recordings gave different results when subjected to two different classifiers. Additionally, capture surveys would be required to verify the presence of the species before any confirmation can be made. Over 312,000 bat recordings were obtained spanning two maternity, one spring emergence, and two swarming / mating seasons within the LSA and RSA. No Tricolored Bat was identified in either survey period, which provides strong evidence that this species does not occur in the RSA. They are not considered further in the impact assessment.

6.15.2.4 Eastern Small-footed Myotis

Eastern Small-Footed Myotis is not expected to occur in the investigation area, as the RSA is located well outside the distribution range of this species, which is limited to southern Ontario, east of Lake Superior. They are not considered further in the impact assessment.

6.15.2.5 Hoary Bat

The Hoary Bat was designated as "Endangered" by COSEWIC in May 2023 due to its vulnerability and population declines primarily from interactions with wind energy facilities. The species has not yet received a designation under SARA, nor has it been assessed provincially, though federal and provincial designations are likely forthcoming. The Hoary Bat roosts solitarily in deciduous and coniferous trees and undertakes long-distance migrations between summer breeding grounds and its winter range. Though it does not roost in cavities or under tree bark, forest stands used by cavity-roosting species also harbour suitable roost trees for Hoary Bats.

The Hoary Bat is the second most abundant species in the RSA, accounting for 15% to 32% of recorded passes during bat maternity habitat acoustic surveys from 2021-2023. The species was detected at every recording station except for one station in 2021 and three stations in 2022 (detailed results in Appendix P-1). As such, the preferred habitat for the species is considered to be all FRI forest ecosites in the baseline investigation area.

6.15.2.6 Silver-haired Bat

The Siver-haired Bat was designated as "Endangered" by COSEWIC in May 2023 due to its vulnerability and population declines primarily from interactions with wind energy facilities. The species has not yet received a designation under SARA nor been assessed provincially, though federal and provincial designations are likely forthcoming. It is typically found roosting in trees, preferring tree cavities or areas under exfoliating bark. As such, suitable roosting habitat generally mirrors that of Little Brown Myotis and Northern Myotis. However, unlike hibernating species, the Silver-haired Bat migrates as an overwintering strategy.

The Silver-haired Bat is the most abundant species in the RSA, accounting for 48% to 55% of recorded passes during bat maternity habitat acoustic surveys from 2021 to 2023. The species was detected at every

recording station (detailed results in Appendix P-1). As such, the preferred habitat for the species is considered to be all FRI forest ecosites in the Project.

6.15.2.7 Eastern Red Bat

The Eastern Red Bat was designated as "Endangered" by COSEWIC in May 2023 due to its vulnerability and population declines primarily from interactions with wind energy facilities. The species has not yet received a designation under SARA, nor has it been assessed provincially, though federal and provincial designations are likely forthcoming. The Eastern Red Bat roosts solitarily in deciduous and coniferous trees and undertakes long-distance migrations between summer breeding grounds and its winter range. Though it does not roost in cavities or under tree bark, forest stands used by cavity-roosting species also harbour suitable roost trees for Eastern Red Bats.

Eastern Red Bat is the least abundant species in the Project, representing only 0.2% of all recorded bat passes from 2021-2023 (detailed results in Appendix P-1).

6.15.2.8 Traditional Knowledge

As part of the Project, all eight Indigenous communities were contacted to participate in the EA process, and to provide Traditional Knowledge and Traditional Land Use (TK/TLU) information. To date, six Indigenous communities, Cat Lake First Nation, Lac Seul First Nation, Mishkeegogamang Ojibway Nation, Slate Falls Nation, Wabauskang First Nation and the Northwestern Ontario Métis Community, have provided Traditional Knowledge and Traditional Land Use information. Specific TK/TLU information relevant to bats was not identified.

6.15.2.9 Recovery Strategy and Critical Habitat

The maternity roosting and foraging habitats form a mosaic, and WSP's habitat mapping considers both habitats. The Recovery Strategy (Humphrey and Fotherby 2019) notes that mining has a low national impact on Little Brown Myotis and Northern Myotis as the scope (proportion of the species expected to be affected) is low. For bats present where development activities occur, the severity is more moderate, and the impact is continuous. The overall Canada-wide threat is very high to high as threats are considered cumulative. In areas where bat populations have significantly declined due to WNS, even the mortality of a small number of bats can impact the survival of the species. Therefore, even a low-impact threat should be carefully managed to avoid further loss.

Area-specific population objectives for Little Brown Myotis and Northern Myotis are defined based on WNS-affected areas and areas that are not yet known to be affected by WNS. The RSA is not yet known to be affected by WNS but likely is as the distance from the RSA to the nearest known infected hibernaculum is within the known movement range for Little Brown Myotis (Canadian Wildlife Health Cooperative 2021, Norquay et al. 2013). The distribution objective for both the Little Brown Myotis and Northern Myotis is to maintain or restore to the pre-WNS extent of occurrence and the population objective in areas not yet affected by WNS is to maintain a stable population trend or, if feasible, achieve an increasing population trend; these objectives are included in mitigation measures (Section 6.15.4). Preventing the introduction of WNS to hibernacula in areas not yet affected is the most important factor for preventing further loss of individuals.

Based on the Recovery Strategy, the assessment criteria will include the following:

- The change in relative abundance of habitat will assess whether hibernacula (confirmed or potential) are impacted. Additionally, it will assess the change in the relative abundance of maternity roosting and foraging habitat in the RSA.

- Change in the function, connectivity, and quality of habitat will assess the maternity roosting and foraging habitat indirectly altered by air, noise, and groundwater drawdown impacts (land-use change).

The change in risk of mortality is based on the assumption that if there are hibernacula present, access to the habitat will be restricted to qualified biologists to limit the risk of WNS spread. Additionally, the risk of mortality will consider if vegetation removal occurs during sensitive times. The goal is to maintain a stable population.

6.15.3 Identification of Potential Effect Pathways

The initial step in the assessment process is to identify interactions between the Project and bats that can result in pathways to potential effects. These potential effects may be direct, indirect, and/or positive effects, where applicable. Table 6.15-4 includes the potential interactions of the Project with bats prior to the application of the mitigation measures. The professional judgement of technical experts experienced with mining projects in Ontario and Canada, as well as input from Indigenous communities, government agencies, and the public, informed the identification of those interactions that are likely to result in a pathway to a potential effect due to a measurable change on bats. These pathways to potential effects are further described below for each phase of the Project, along with the rationale for those interactions excluded from further assessment. Section 6.15.4 and Table 6.15-5 provides a description of the mitigation measures applied to during all phases of the Project. The residual effects, after the application of the mitigation measures, are then described and further evaluated in Section 6.15.6, using the criteria and indicators identified in Section 6.15.1.4.

Construction Phase

The construction phase of the Project is expected to occur over a three-year period and will include the preparation of the site and the construction of mine infrastructure. The following interactions with the Project result in pathways to potential effects on bats as described below. After mitigation is applied to each pathway, as described in Table 6.15-5, the residual effects are assessed using the criteria identified for each pathway:

- Site preparation activities for the mine site area, including clearing, grubbing, and bulk earthworks, interacts with bats.
  - These activities result in pathways to potential effects on bats due to:
    - the removal of vegetation which may directly affect habitat for bats;
    - the regrading and alterations in catchment areas may change the contribution of surface water and indirectly affect habitat for bats;
    - the use of equipment may cause sensory disturbances and air emissions (including dust) which may indirectly affect habitat for bats; and
    - the use of equipment may increase potential collisions with bats and may change the risk of mortality.
  - The assessment of potential effects on bats includes the change in habitat; the changes in the function, connectivity and quality of habitat; and the change in the risk of mortality from these pathways.
- The construction of the mine access road and airstrip, including the development and operation of potential aggregate resource areas, interacts with bats. These activities result in pathways to potential effects on bats due to the removal of vegetation, which may directly affect habitat for bats; the use of equipment may change sensory disturbances and air emissions, which may

indirectly affect habitat for bats; and, may increase potential collisions with bats leading to changes in the risk of mortality. The assessment of potential effects on bats includes the change in habitat; the changes in the function, connectivity and quality of habitat; and the change in the risk of mortality from these pathways.

- The construction of the transmission line interacts with bats. This activity results in pathways to potential effects on bats due to the removal of woody vegetation, which may directly affect habitat for bats; the use of equipment may change sensory disturbances and air emissions which may indirectly affect habitat for bats; and the use of equipment may increase potential collisions with bats and may change the risk of mortality. The assessment of potential effects on bats includes the change in habitat; the changes in the function, connectivity and quality of habitat; and the change in the risk of mortality from these pathways.
- The development of temporary construction camp and staging areas, the fish habitat development area, the onsite haul and access roads, the buildings and onsite infrastructure, the construction of the dikes, the construction of the starter embankments for the CDF, the development of the surficial soil stockpile and ore stockpiles interacts with bats. These activities result in pathways to potential effects on bats due to the use of equipment may change sensory disturbances and air emissions which may indirectly affect habitat for bats; and the use of equipment may increase potential collisions with bats and may change the risk of mortality. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat, and the change in the risk of mortality from these pathways.
- The controlled dewatering of the open pit basin interacts with bats. This activity results in a pathway to a potential effect on bats due to the change in groundwater levels that may indirectly affect habitat for bats. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat from this pathway.
- The development of the central water storage pond and other water management and treatment facilities interacts with bats. These activities result in pathways to potential effects on bats due to the change in catchment areas and surface water regimes levels which may indirectly affect habitat for bats; the use of equipment may change sensory disturbances and air emissions which may indirectly affect habitat for bats; and may increase potential collisions with bats leading to change in the risk of mortality. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat as well as the change in the risk of mortality from these pathways.
- The commissioning of the process plant, the stripping of lake bed sediments and overburden in the open pit and the initiation of pit development interacts with bats. These activities result in pathways to potential effects on bats due to the change in sensory disturbances from the process plant and equipment which may indirectly affect habitat for bats; and may increase potential collisions with bats leading to a change in the risk of mortality. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat, as well as the change in the risk of mortality from these pathways.

There is no plausible interaction between employment and expenditure activities and bats during any Project phase.

Operation Phase

The operation phase is anticipated over a 10-year period, but the removal of habitat will occur during the construction phase. The following interactions with the Project result in pathways to potential effects on bats as described below. After mitigation is applied to each pathway, as described in Table 6.15-5, the residual effects are assessed using the criteria identified for each pathway:

- The operation of the process plant interacts with bats. This activity results in a pathway to a potential effect on bats due to the operation of the plant and associated equipment changing sensory disturbances, which may indirectly affect the habitat of bats. The assessment of potential effects on bats includes the changes in the function, connectivity, and quality of habitat from this pathway.
- The operation of the open pit mine interacts with bats. This activity results in pathways to a potential effect on bats due to ongoing groundwater management, which may continue to indirectly affect the habitat for bats, and the use of equipment and blasting may change sensory disturbances and air emissions (including dust), which may indirectly affect habitat for bats. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat from these pathways.
- The management of overburden, mine rock, tailings, and ore in designated facilities interacts with bats. These activities result in pathways to potential effects on bats due to the use of equipment and operation of haul trucks may change sensory disturbances and air emissions (including dust) which may indirectly affect the habitat for bats; and the use of equipment may increase potential collisions with bats and may change the risk of mortality. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat as well as the change in the risk of mortality from these pathways.
- The operation of water management and treatment facilities interacts with bats. These activities result in pathways to a potential effect on bats due to the ongoing management of surface water from the regrading and alterations in catchment areas may continue to indirectly affect habitat for bats; and the use of equipment and operation of pumps may change sensory disturbances which may indirectly affect habitat for bats. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat from these pathways.
- The operation and maintenance of mine site infrastructure, including the mine access road, the transmission line and the airstrip interacts with bats. These activities result in pathways to potential effects on bats due to the management of vegetation which may indirectly affect habitat for bats; the use of equipment, the operation of Project vehicles and haul trucks, and the operation of aircraft may change sensory disturbances, which may indirectly affect habitat for bats; and the use of equipment may increase potential collisions with bats and may change the risk of mortality. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat as well as the change in the risk of mortality from these pathways.
- Progressive reclamation activities interact with bats. These activities result in pathways to potential effects on bats due to the change in vegetation communities from revegetation activities may directly affect habitat for bats; ground disturbances from regrading may change the contribution of surface water and indirectly affect habitat for bats; the use of equipment may change sensory disturbances and air emissions (including dust) which may indirectly affect habitat for bats; and may increase potential collisions with bats leading to changes in the risk of mortality. The assessment of

potential effects on bats includes the changes in the function, connectivity and quality of habitat as well as the change in the risk of mortality from these pathways.

The operation of the accommodations complex will not interact with bats as there is no associated direct or indirect change in habitat or change in the risk of mortality.

Decommissioning and Closure Phase

Activities occurring during this active closure phase, which is expected to occur over a five-year period, are similar to those that occur during the construction phase and use similar mining equipment, but generally on a smaller scale. The following interactions with the Project result in pathways to potential effects on bats, as described below. After mitigation is applied to each pathway, as described in Table 6.15-5, the residual effects are assessed using the criteria identified for each pathway:

- The reclamation of impacted areas, such as by regrading to provide stable slopes and reduce the potential for erosion, placement of cover in designated areas to provide stability, and revegetation activities interacts with bats. These activities result in pathways to potential effects on bats due to the change in vegetation communities from revegetation activities may directly affect habitat for bats; ground disturbances from regrading may change the contribution of surface water and indirectly affect habitat for bats; the use of equipment may change sensory disturbances and air emissions (including dust) which may indirectly affect habitat for bats; and may increase potential collisions with bats leading to changes in the risk of mortality. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat as well as the change in the risk of mortality from these pathways.
- The filling of the open pit basin with water interacts with bats. This activity results in pathways to potential effects on bats due to the change in groundwater levels may indirectly affect habitat for bats. The assessment of potential effects on bats includes the changes in the function, connectivity and quality of habitat from this pathway.

Removal of assets, the demolition and recycling and/or disposal of remaining materials and the removal and disposal of demolition-related wastes in approved facilities are not anticipated to result in potential effects on bats. Beyond closure, the activities will be primarily monitoring, and there are no anticipated potential effects on bats.

6.15.4 Mitigation Measures

Measures to be implemented to avoid or minimize the effects of the Project on bats include:

- Develop a compact mine site to limit the areal extent of disturbance.
- Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
- Avoid the removal of bat maternity habitat between April 15 and August 31 during the construction phase, unless authorized under an ESA or other appropriate approval.
- Follow appropriate timing windows for vegetation removals; in combination with timing windows for wildlife and wildlife habitat (6.12), Boreal Caribou (6.13), Wolverine (6.14), and SAR birds (6.16), vegetation removals should only occur between September 15 to January 14.
- Maintain a 500 m radius of uncleared habitat around the entrance for candidate bat hibernacula, unless otherwise authorized under an ESA or other appropriate approval.

- During construction and operation phases, avoid the removal / disturbance of foraging habitat within 2.6 km of candidate bat hibernacula, unless authorized under an ESA or other appropriate approval.
- Undertake offsetting measures for bats such as establishing artificial hibernacula, as required by relevant ESA approvals.
- Implement the mitigation measures for potential effects on air quality relevant to bats (Section 6.2.4) including:
    - During construction, operation and active closure, a dust management plan will be implemented to identify potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed.
    - Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray and supplemented by dust suppressants, if required;
    - Site roads will be maintained in good condition, with regular inspections and timely maintenance completed to minimize the silt loading on the roads; and,
    - Vehicle speeds will be limited.
- Implement the mitigation measures for potential effects of noise relevant to bats (Section 6.3.4) including:
    - Building dimensions, layout and orientation will be designed to shield noise sources, where possible.
    - Acoustical enclosures will be used in the process plant to limit overall noise emissions from key noise sources, such as the ball mills.
    - Generator intakes and exhausts in the process plant will use silencers.
    - Motorized equipment will be selected or designed with mufflers / silencers to limit noise emissions during all phases of the Project
    - Reversing alarms should be dimmable with white noise and/or strobe lights, but in accordance with the applicable health and safety regulations, during all phases of the Project
    - The use of engine brakes will be prohibited.
    - Vehicles and equipment will be operated in such a way that impulsive noise is minimized, where possible, during all phases of the Project
    - Regular inspections will take place to confirm that equipment and machinery used on site is operated in good working condition through regular maintenance.
    - For helicopter use during transmission line construction, minimum flight altitudes will be maintained unless the helicopters are engaged in construction tasks, landing or departure.
- During construction, operation and closure phases, implement mitigation measures for lighting to minimize sensory disturbance (Appendix J), including:
    - To prevent a direct line-of-sight from light, maintain light sources below natural barriers such as tree lines or artificial barriers such as berms; and,

- Minimize light spill and glare using shielding on stationary light sources and direct lighting downwards where practicable.

- Implement the mitigation measures for potential effects on surface water systems relevant for bats (Sections 6.6.4, Section 6.7.4 and Section 6.7.4) including:
  - During construction, operation and active closure, an erosion and sediment control plan will be implemented to manage runoff water in disturbed areas.
  - During construction, operation and active closure, an integrated water management system will be designed to collect and control contact water.
  - Water collection ditches will be constructed and operated around the perimeter of infrastructure, including the CDF and stockpiles to collect overland flow and seepage and direct it to the integrated water management system.
  - Non-contact water will be diverted away from Project components using ditches, diversion berms and other suitable measures.
  - Collected contact water that is not recycled in ore processing will be treated at the effluent treatment plant and discharged to the southeast arm of Springpole Lake in accordance with permitting requirements.
- Implement the mitigation measures for potential effects on vegetation communities and wetlands relevant to bats (Section 6.11.4) including:
  - During construction and operation, minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation;
  - During construction and operation, minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs;
  - During construction, operation and active closure phases, implement mitigation measures for wetlands;
  - During operation and closure phases, undertake progressive and final rehabilitation of mine development in accordance with the filed Closure Plan, and implement a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and wildlife habitat features including bats.
- Implement the mitigation measures for potential effects on wildlife and wildlife habitat relevant to bats (Section 6.12.4) including:
  - During construction, operation and closure phases of the Project, domestic solid waste products and similar materials will be properly secured, stored and disposed of at an offsite licensed facility, particularly anything that is an attractant for scavenging wildlife. Domestic solid waste products will be transported to a landfill off site, mitigating the habitat sink effect of increased predator densities that can be created due to access to landfill sites.
  - During construction of the Project, minimize the disturbance by using existing trails and roads for travel, where practical.

- During the operation phase of the mine access road, enforce reduced speed limits along Project-controlled roads within high-quality wildlife habitats, particularly along segments with known or recurrent wildlife crossings;
- During the operation phase of the mine access road, Project-related vehicles travelling on the mine access road must come to a stop if wildlife is encountered and provide them with the right-of-way to cross the road;
- During the operation phase of the transmission line, minimize vegetation management to that necessary for safe operation;
- During construction, operation and closure phases, wildlife (including SAR) awareness training will be provided to Project employees; and
- During construction, operation and closure phases, log (and report as needed) observed wildlife, sign / tracks and wildlife–vehicle collisions and alter mitigation measures as appropriate.

The application of mitigation measures to specific pathways and phases is illustrated in Table 6.15-5. Mitigation measures described in this section are expected to be effective for their intended purposes given their effective implementation at similar projects.

Monitoring programs will be implemented to verify the accuracy of the predicted effects, assess the effectiveness of the implemented mitigation measures and may be further optimized in response to monitoring data. Extensive monitoring programs are in place for the Project with several years of data collection completed. Monitoring for the Project going forward is further described in Section 12 and will be further refined during the permitting phase to incorporate conditions of approvals and permits. Consultation on the monitoring programs is expected to continue through all phases of the Project.

6.15.5 Analytical Methodology

To quantify the direct effects of removing habitat from the PDA, it was conservatively assumed that all habitat (terrestrial and wetland vegetation communities) would be removed. Habitat mapping was overlaid with the PDA in GIS tools, and the removal areas were calculated.

Areas adjacent to the PDA within the LSA may experience indirect effects, such as edge effects, changes in light and changes in environmental conditions due to dust, noise, and limited groundwater changes. Changes in air quality parameters such as dust were modelled for the Project (Appendix G-2). The potential changes in air quality above background levels around the mine site area are considered in the quantification of indirect effects on bat habitat, but not along the mine access road or transmission line, given the short duration of those construction activities (Figure 6.15-3). Changes in the acoustic environment during the operation of the mine site area (Year 4) were modelled, as described in Appendix H-3, and the indirect effects on bat habitat were quantified for noise levels above 40 A-weighted decibels (dBA; Figure 6.15-4). The controlled dewatering of the open pit basin will result in a groundwater drawdown cone (Appendix L-2) that emanates radially from the open pit toward the nearest boundary conditions (i.e., Springpole Lake and Birch Lake), as shown in Figure 6.15-2. The 2 m drawdown contour indicates an inferred zone of influence on bat habitat and is quantified as an indirect effect on bat habitat. These indirect effects are quantified by overlaying the predicted changes in the environmental conditions on habitat mapping within the LSA and the removal areas were calculated. The assessment of potential indirect effects (e.g., sensory disturbance, groundwater drawdown), does not account for the removal of the PDA (i.e., the area directly impacted by the PDA is not subtracted from the indirect impact calculations).

The assessment of potential change in the risk of mortality to species was undertaken in a qualitative manner, considering experience with other mine operations, literature, and Project-specific factors.

6.15.5.1 Assumptions and the Use of the Conservative Approach

For the purposes of this effects assessment, the following assumptions have been made:

- The PDA contains buffers to allow for flexibility for design optimizations during Project permitting. The buffer includes approximately 250 m around the mine site area, a 40 m wide corridor for the transmission line, and the 30 m wide corridor for the mine access road. Where the mine access road and transmission line are aligned together, the buffer is included within a 60 m wide corridor.
- The 2021 FRI ecosite mapping was used for the purposes of this effects assessment to support the analyses presented in this assessment. As noted in Section 6.15.5, it has been conservatively assumed that all vegetation communities supporting bats within the PDA will be removed during construction and as a result, all wildlife habitat within the PDA will be removed. However, in reality, vegetation communities will be maintained in specific areas to provide a buffer along waterbodies and mine site infrastructure where necessary.
- As noted, it is conservatively assumed that all vegetation communities / habitats in the PDA will be removed. However, the assessment of potential indirect effects (e.g., sensory disturbance, groundwater drawdown), does not account for the removal of the PDA (i.e., the area directly impacted by the PDA is not subtracted from the indirect impact calculations). This assumption further applies a conservative approach.
- Progressive rehabilitation will occur at select locations during construction and operation when disturbance activities have been completed. Nevertheless, to be conservative, the assessment of the effects assumes that final rehabilitation activities will be completed during the active closure phase.
- In determining the habitat for bats, it is assumed that all forested FRI ecosites (sparse treed, coniferous treed, deciduous treed, coniferous swamp and deciduous swamp) can support maternity colonies. In addition, Northern Myotis has been confirmed at only two locations, yet it is assumed to occur throughout the RSA.
- The Ontario Recovery Strategy defines bat foraging activity as greatest within 40 m of a forest edge (Humphrey and Fotherby 2019). Therefore, foraging habitat is characterized in this section as all areas within 40 m of maternity habitat, a 40 m buffer along the inside of all lake edges, forest, and watercourses, and any area within a 2,600 m buffer around a confirmed hibernaculum.
- The noise threshold to evaluate the effects of sensory disturbance is assumed to be greatest within the 40 dBA contour around the mine site area. Literature indicates that wildlife responses begin at noise levels of approximately 40 dBA, documented impacts occurring below 50 dBA (Shannon et al. 2016). As a result, a 40 dBA continuous noise threshold is used as a disturbance benchmark, which correspond to the noise of a suburban area at night.
- The assessment of changes in air quality are based on the predicted changes in dust deposition under a highly conservative scenario in which silt content was modelled at 5.8% and dust control efficiency was modelled at 85%, used to evaluate the sensitivity of a more realistic scenario for dust predictions.

- The assessment of mortality risk focuses on the construction and operation phases, as a conservative scenario, as the risk of mortality would be expected to be less during the decommissioning and closure phase once the footprint has been restored. It is assumed that the implementation of sensitive timing windows would effectively reduce the risk of mortality during the removal of vegetation.

6.15.6 Characterization of Potential Residual Effects

The assessment and characterization of potential residual effects on bats is focused on the direct habitat losses, indirect habitat alterations, and the risk of mortality during the Project, as discussed below.

6.15.6.1 Change in Relative Abundance of Habitat

The direct change in the relative abundance of bat habitat will occur in the PDA during the construction phase. It has been conservatively assumed that all terrestrial and wetland vegetation communities in the PDA (2,026 ha) will be removed during construction. However, the actual footprint of the Project is 1,365 ha, with 670 ha representing the terrestrial habitat overprinted by the mine site.

Bat maternity habitat was mapped using the bat maternity habitat criteria (MECP 2022) and habitat suitability evaluations conducted during baseline surveys from 2021 to 2023. Based on the suitability modelling, there is 21,154 ha of available bat maternity roosting habitat in the LSA, and 463,795 ha in the RSA (Table 6.15-6). Foraging habitat was also mapped, using criteria from the Ontario recovery strategy for SAR bats (Humphrey and Fotherby 2019) and the available bat foraging habitat in the LSA is 10,670 ha, with 218,140 ha in the RSA (Table 6.15-6). Extensive baseline studies did not document bat hibernacula within the PDA.

As a result of the construction of the Project, the removal of vegetation will result in the loss of 1,677 ha of bat maternity roosting habitat in the PDA (Table 6.15-6). This represents a reduction of 7.9% in the LSA and 0.4% in the RSA, demonstrating that there is an abundance of suitable bat maternity habitat in the RSA and sufficient alternate roosting sites available nearby. Additionally, the removal of roosting habitat (i.e., forests) may result in the generation of new commuting and foraging habitat. The effect of tree clearing on bat population sizes may be variable since population sizes are difficult to estimate and bat activity can increase after clearing due to increased suitable edge foraging habitat. Roost exclusion studies suggest that exclusion from permanent structures can decrease site fidelity, alter home range size, lower reproductive recruitment, and reduce colony size and the strength of association among individuals. However, removal of roosts at a small scale has shown no effect on the distribution and roost selection of Northern Myotis, although Little Brown Myotis change roosts less often and may be less resilient (Silvis et al. 2015b).

The construction of the Project will also result in the loss of 469 ha of bat foraging habitat in the PDA (Table 6.15-6). This represents a reduction of 4.4% in the LSA (10,670 ha available) and a reduction of 0.2% in the RSA (218,140 ha available), demonstrating that there is an abundance of suitable foraging habitat in the RSA and sufficient alternate foraging habitat available. Preferred foraging habitat for SAR bats includes forest edges, clearings, and waterbodies. Foraging for Northern Myotis also occurs within the forest interior along canopy-covered clearings and waterways. Most bats prefer to forage in proximity to their roost, although Little Brown Myotis may travel over 5 km from the roost to forage. The removal of wetland habitat adjacent to suitable roosting habitat may also reduce the quality of the roosting habitat if alternative foraging areas are unavailable. The removal of foraging habitat may cause bats to expend unnecessary energy locating new and potentially farther foraging grounds or cause them to seek new roosting sites in proximity of better foraging habitat.

The removal of bat habitat is direct and localized to the PDA and occurs in a landscape with high forest cover. There is less than a 1% direct loss of maternity roosting and foraging habitat in the RSA, and sufficient suitable habitat exists elsewhere to support bats. Progressive reclamation measures carried out during operations and final reclamation at closure may promote the re-establishment of vegetation for roosting and foraging habitat. While the vegetation communities are not likely to return to the pre-existing conditions, this is not expected to limit the ability of this species to move through the landscape.

With the implementation of the mitigation measures described in Table 6.15-5, there will be a residual effect on bats due to the loss of 1,677 ha of maternity roosting habitat and due to the loss of 469 ha of foraging habitat during construction.

6.15.6.2 Change in the Function, Connectivity and Quality of Habitat

Indirect changes in the function, connectivity, and quality of bat habitat will occur during the construction, operation and closure phases; however, the most pronounced effects will occur during the operations phase. These indirect changes in habitat at the LSA scale will result from activity within the PDA due to changes in groundwater, changes in dust deposition, change in lighting and changes in sound levels.

The change in the groundwater due to the dewatering of the open pit could affect the suitability and utilization of local adjacent bat habitats and result in reduced habitat effectiveness due to fragmentation and changes in habitat configuration. This could affect the abundance and composition of wetland vegetation and, thus, the composition of insect species that bats prey on. This also has the potential to affect trees currently supporting roosts and may change the characteristics of the habitat from a treed swamp to a more open-water habitat, thereby reducing available roosting habitat. The changes in groundwater within the LSA (Figure 6.15-2) may affect 570 ha of bat maternity habitat and 148 ha of bat foraging habitat (Table 6.15-7). This represents a reduction of 2.7% in maternity habitat and a reduction of 1.4% in foraging habitat in the LSA and represents a reduction of 2.7% in maternity habitat and 1% in foraging habitat in the RSA (Table 6.15-7). The groundwater drawdown (Figure 6.15-2) is primarily restricted to the PDA, and therefore, the development of the Project during construction will have already directly removed the majority of the habitat. As a result, there will be a negligible change to bat maternity and foraging habitats due to changes in groundwater during operations. During the closure phase, the Project area will be rehabilitated resulting in a return to near-baseline conditions for groundwater flow once dewatering activities cease. As a result, there will be no contribution to residual effects on the function, connectivity and quality of bat habitat due to the groundwater pathway.

Dust from operations may negatively impact forest canopies and, thus, habitat for roosting bats. The air quality isopleth for dust was used to calculate the area of potential bat habitat that may be affected. The air quality contour is largely focused on the Project where the direct loss of habitat has already occurred and there is limited high-value terrestrial habitat suitable for bats, as the majority of the area is open water. Still, in keeping with the conservative assumptions, the air quality contour is evaluated with the habitat mapping (Table 6.15-8). The modelled change in dust deposition during operation affects 1,464 ha of bat maternity habitat and 537 ha of bat foraging habitat in the LSA (Section 6.15.6.2). This change in habitat from dust represents a reduction of 6.9% of the available maternity habitat and 5.0% of the available foraging habitat in the LSA, and a reduction of 0.3% of the available maternity habitat and 0.3% in available foraging habitat in the RSA (Table 6.15-8). The majority of this habitat will be lost during the construction of the Project, as noted above, with habitat on islands outside of the Project potentially affected by dust deposition. As noted in Section 6.15.1.5, the calculated amount of bat habitat indirectly affected by dust was based on the air quality isopleth for dust that conservatively assumed a higher silt content (5.8%) and lower control efficiency (85%). With the implementation of mitigation measures such as the dust

management plan, the application of water sprays on roads and limiting speed limits, the pathway to a potential effect on bat habitat due to dust will be effectively mitigated. As a result, there will be no contribution to residual effects on the function, connectivity and quality of bat habitat from this pathway.

Artificial lighting will be required during the construction, operation and closure phases of the Project. The use of artificial lighting may affect bats due to avoidance of commuting routes that are affected by artificial lighting; changes in foraging areas affected by artificial lighting; delayed emergence from roosting areas; avoidance of roosting areas affected by artificial lighting; and, reduced reproductive success (Stone et al. 2015). An assessment of the effect of light from the Project was conducted (Appendix J) and measures to mitigate potential effects are identified in Table 6.15-5. Further, light disturbances that may have indirectly changed habitat will be discontinued at the end of the closure phase. With the implementation of mitigation for lighting through the construction, operation and closure phases, the potential effect of lighting on bat habitat will be mitigated within the PDA. As a result, there will be no contribution to residual effects on the function, connectivity and quality of bat habitat from the artificial lighting pathway.

During construction and operation of the Project, sensory disturbance is the main driver of altered habitat used by bats for foraging and maternity roosting. Activities occurring during operations will result in increased sound levels that will reduce the distance and area over which acoustic signals can be perceived (Barber et al. 2009). Bats use echolocation to navigate their environment and to search for prey, which consists of emitting pulses of high-frequency sound and listening for returning echoes. Differences in time and frequency between the pulses and their echoes provide bats with information about their surroundings (Naughton 2012). Evidence shows that foraging bats are deterred by, and avoid, anthropogenic noise from traffic and construction activities, and these effects are greatest for bats that emit lower-frequency echolocation calls and bats that detect their prey by listening for the sounds they produce (Schaub et al. 2009, Bunkley et al. 2015, Finch et al. 2020). The Hoary Bat and the Silver-haired Bat are considered low-frequency species and may be more susceptible to effects of noise, although all bats are likely affected by Project-related noise.

Baseline sound levels were monitored, and the average nighttime sound level is 25 dBA during the leaves-off period (April 2021; Appendix H-1) and 35 dBA during the leaves-on period (June 2021; Appendix H-2). Changes in sound levels during the worst-case scenario (Year 4 of the operation phase) were modelled using the 40 dBA threshold to determine the extent of potential effects on bat habitat. The sensory disturbance from the change in sound levels will affect 2,434 ha of bat maternity habitat and 3,057 ha of bat foraging habitat (5,491.07 ha total bat habitat). The affected habitat from sound level changes represents a reduction of 0.12% in maternity habitat and a reduction of 0.29% in foraging habitat in the LSA, and a reduction of less 0.01% in maternity habitat and foraging habitat in the RSA (Table 6.15-9). As the majority of these habitats will be directly lost due to vegetation removal during construction of the Project (Section 6.15.6.2), there will be a reduction in the amount of bat habitat indirectly affected by sensory disturbances. Modelled noise impacts encompass the mine site area and the mine access road from the mine site area to the end of Wenasaga Road. The PDA numbers for the mine site area are 1,527.9 ha and the portion of the mine access road is 183.7 ha (1,711.6 ha total; land and open water). Open water is not mapped as bat habitat, however, if 1,711.6 ha (PDA) is subtracted from 5,491.07 ha (bat habitat), 3,779.47 ha remains and the affected habitat from sound level changes represents a reduction of 0.23% of the LSA and 0.01% of the RSA. However, substantial portion of the area around the mine site area consist of open waterbodies, which are not targeted by bats aside from the shorelines. The majority of this foraging habitat is located within 2.6 km of the candidate hibernaculum on the north shore of the southeast arm of Springpole Lake, away from the mine site area where sound levels will be more continuous during the operation phase. The area along the transmission line will be affected only for brief periods during

construction and typically during winter when bat activity is low. The area along the mine access road will be affected only sporadically, when used by Project vehicles and equipment. During the closure phase, sensory disturbances will be discontinued, thereby reducing the potential for effects on bats. As a result, with the implementation of noise mitigation (Table 6.15-5), sensory disturbances due to the change in sound levels will result in a residual effect to the function, connectivity and quality of bat habitat of less than 1% of the bat maternity and foraging habitat in the RSA.

Hibernacula are relatively scarce on the landscape and bats return to the same hibernacula year after year. Bats may travel substantial distances to hibernacula from summering sites, and even between multiple hibernacula during the fall swarming (i.e., breeding) season. Disturbances to a hibernaculum may affect the survival of bats through the energetic costs of unanticipated long distances associated with locating alternative overwintering sites. Effects of noise disturbance to the candidate hibernaculum Cliff 1 were therefore considered. The MECP (2021) recommendations state that "activities producing loud noises and/or vibrations (e.g., blasting, drilling, movement of heavy equipment) that occur more than 500 m from a bat hibernaculum are unlikely to harm or harass hibernating bats." The closest candidate hibernaculum is Cliff 1, which is located more than 500 m from the PDA and is not expected to be affected by sensory disturbance from the Project.

With the implementation of the mitigation measures listed in Table 6.15-5, there will be a residual effect from the indirect loss of maternity roosting and foraging habitat due to noise.

6.15.6.3 Change in the Risk of Mortality

Ground disturbance and vegetation clearing can result in physical disturbance of key habitat features (e.g., bat maternity roosts), and vehicle and equipment movement can result in accidental mortality (i.e., wildlife-vehicle collisions), which is elevated during sensitive timing windows. If vegetation clearing of bat maternity habitat is undertaken outside the active season of April 15 to August 31 for maternity-roosting bats, the risk of mortality of maternal females and their young will be greatly reduced. There is no change in the risk of mortality outside of the PDA as vegetation removal will only occur within the PDA. During operation, increased insect activity along linear corridors may increase the risk of vehicle–bat collisions (Claireau et al. 2019). However, if lower speed limits are enforced, the risk of mortality due to vehicle collisions will be minimized.

Construction and operation activities will not directly result in the removal or physical alteration of the candidate hibernaculum (Cliff 1). Noise from Project activities may deter bats from using a nearby hibernaculum and may also cause bats to arouse more frequently causing them to prematurely exhaust their energy reserves and lead to mortality. However, the closest candidate hibernaculum (Cliff 1) is located more than 500 m from the mine access road portion of the PDA and is not expected to be affected by sensory disturbance from the Project.

With the implementation of the mitigation measures identified in Table 6.15-5, including conducting vegetation removal outside the active season (April 15 to August 31), enforcing speed limits for Project-related vehicles, and maintaining a 500-meter buffer around candidate hibernacula, the risk of mortality will be minimized.

6.15.7 Significance of Residual Effects

The ecological and/or social context of bats is considered low (Level I) as the VC is capable of supporting the predicted change with typical mitigation measures. Suitable maternity and foraging habitat is abundant throughout the RSA, and the Project results in less than one percent change in the availability of these habitat types at that scale. Baseline studies confirm that bats use a broad range of forested ecosites across

the RSA, providing multiple alternate roosting and foraging areas. No hibernacula occur within the PDA, and the nearest candidate hibernaculum is located more than 500 m from the PDA, consistent with guidance that effects at this distance are unlikely to affect hibernating bats. Bats are expected to maintain access to the habitat and ecological functions necessary to support survival and reproduction

6.15.7.1 Change in Relative Abundance of Habitat

With the implementation of mitigation measures identified in Table 6.15-5, the magnitude of the residual effect from the direct loss of bat habitat is low (Level I). The removal of maternity roosting and foraging bat habitat within the PDA represents less than 1% of this habitat in the RSA. These habitats are common throughout the LSA and RSA, and there is a low potential to adversely affect bats or their habitat required to carry out the life processes necessary to survive and reproduce. The candidate hibernaculum is not located in the PDA and, therefore, will not be impacted, which is in line with the Recovery Strategy (Humphrey and Fotherby 2019) objectives. The geographic extent of the residual effect from the direct loss of bat habitat will be confined to the PDA (Level I). The duration of the residual effect is high (Level III), as the effects will occur over the long term, lasting throughout all phases of the Project until suitable roost trees are re-established after rehabilitation. The timing of the residual effect will be mitigated avoiding vegetation clearing during sensitive timing windows and is therefore low (Level I). The residual effect is predicted to be infrequent (Level I), as it will occur once during construction. It is partially reversible with rehabilitation of the mine site areas at closure, resulting in revegetation that may support bats over time (Level II). As a result, the adverse residual effect on bats due to a change in the relative abundance of habitat is predicted to be not significant.

6.15.7.1 Change in the Function, Connectivity, and Quality of Habitat

The residual effect to the function, connectivity and quality of bat habitat is predicted to be less than 1% of the available bat maternity and foraging habitat in the RSA. The predominant pathway for the residual effect is due to changes in sound resulting in sensory disturbances. With the implementation of mitigation measures identified in Table 6.15-5, including the dust management plan, and measures to attenuate noise, the magnitude of the residual effect on the function, connectivity and quality of bat habitat is low (Level I), as habitat functions are likely maintained elsewhere in the RSA. The abundance and/or distribution of species and habitats are not predicted to change the status of populations or the availability of unique habitats, given that the removed habitat types are abundant across the RSA. The geographic extent of the residual effect is low (Level I), as it is constrained within the LSA. The duration and frequency of the residual effect is considered moderate (Level II), as it will occur continuously over the medium term, throughout the construction and operation phases but is predicted to be fully reversible (Level I) as Project activities cease after closure and function, connectivity, and quality of habitat returns to existing conditions. However, the residual effect may occur occasionally during sensitive periods and therefore the timing is considered to be moderate (Level II). As a result, the adverse residual effect on bats due to a change in the function, connectivity and quality of bat habitat is predicted to be not significant.

6.15.7.1 Change in the Risk of Mortality

The candidate hibernaculum is not located in the PDA and noise from Project activities is not expected to affect potential swarming or hibernating bats at Cliff 1 as mitigation to limit noise within 500 m of Cliff 1 will be implemented as per MECP guidelines (MECP 2021), therefore, will not be impacted by Project activities. With implementation of mitigation measures, there may be a low potential for a change in the risk of mortality during construction and operational activities in previously undisturbed habitat. The magnitude of the change in the mortality risk is considered low (Level I) as there is a low potential to

adversely affect the local population. The geographic extent of the residual effects will be confined to the PDA (Level I), however the duration of the residual effects on bats is moderate (Level II), as the effects may occur over the medium term, during construction and operation. The residual effects are predicted to occur infrequently during construction and operations (Level I), and the effects will be reversible as Project activities cease after closure (Level I), and the risk of mortality returns to existing conditions. The timing of the residual effect is low (Level I), as construction activities will occur outside sensitive periods for bats. As a result, the adverse residual effect on bats due to a change in mortality is predicted to be not significant.

6.15.8 Confidence Prediction

The confidence level in the prediction is considered moderate to high based on the quality and quantity of baseline information, updated FRI data and the GIS mapping techniques. Baseline data incorporated representative surveys from across the PDA, LSA, and RSA during three bat maternity roosting seasons, following federal and provincial survey guidelines. The updated FRI data were used to undertake habitat mapping and GIS analysis. The assessment of changes in the function, connectivity, and quality of bat habitat relied on the results of predictive modelling undertaken for groundwater, noise, air, and lighting. Further, assessing potential effects on bats included consideration for applicable Recovery Strategies and using realistic but conservative assumptions. The identified mitigation measures are industry standards successfully implemented at other mining projects and are informed by species-specific information, where available.

6.15.9 References

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Table 6.15-1: Bat Criteria, Indicators, and Rationale

Criteria	Indicators	Rationale
Change in habitat	• Area and relative abundance of habitat, in hectares • Removal of hibernacula	Based on the Recovery Strategy for the Little Brown Myotis Northern Myotis and Tri-colored Bat in Ontario (Humphrey and Fotherby 2019), the change in habitat is selected because the area and relative abundance of habitat (i.e., maternity roosts and foraging and hibernacula) provide a measure of the availability of resources (e.g., food, shelter). A decrease in the area or relative abundance of habitat can affect wildlife abundance and habitat availability.
Change in the function, connectivity, and quality of habitat	• Area indirectly altered, in hectares	Based on the Recovery Strategy the Little Brown Myotis Northern Myotis and Tri-colored Bat in Ontario (Humphrey and Fotherby 2019), the change in the function, connectivity, and quality of habitat is selected because it can affect movement and dispersal, access to resources, and survival. Landscape fragmentation (function of connectivity) can reduce the probability that some wildlife species can persist on a landscape.
Change in the risk of mortality	• Qualitative risk of mortality	Based on the Recovery Strategy for the Little Brown Myotis Northern Myotis and Tri-colored Bat in Ontario (Humphrey and Fotherby 2019), the change in the risk of mortality is selected because ground disturbance, vegetation clearing and vehicle movement can result in accidental mortality (e.g., wildlife–vehicle collisions). A qualitative assessment is used to identify potential risks.

Table 6.15-2: Significance Determination Attributes and Rankings for Bats

Attribute	Description	Category
Magnitude	A qualitative or quantitative measure to describe the size or degree of the residual effects relative to baseline conditions	**Level I:** The Project-related residual effect has a low potential to adversely affect bats and/or the habitat required for bats to carry out the life processes necessary to survive and reproduce. Bat habitat functions are likely maintained elsewhere in the RSA. Project-related changes in habitat are less than 1% of the RSA. **Level II:** The Project-related residual effect has a moderate potential to adversely affect bats and/or the habitat required for bats to carry out the life processes necessary to survive and reproduce (e.g., some temporary changes in behaviour but not expected to have long-term impacts on the population or change the status of local populations or the availability of unique habitats). Bat habitat functions are likely maintained elsewhere in the RSA. Project-related changes in habitat are between 1% and 5% of the RSA. **Level III:** The Project-related residual effect has a high potential to adversely affect bats and/or the habitat required for bats to carry out the life processes necessary to survive and reproduce. Bat habitat functions are not maintained elsewhere in the RSA. Project-related changes in habitat are greater than 5% of the RSA.
Geographic extent	The spatial extent over which the residual effect will take place	**Level I:** Effect is restricted to within the LSA. **Level II:** Effect extends beyond the LSA. **Level III:** Effect extends beyond the RSA.
Duration	The time period over which the residual effect will or is expected to occur	**Level I:** Effect occurs over the short term: less than or equal to 3 years. **Level II:** Effect occurs over the medium term: more than 3 years but less than 20 years. **Level III:** Effect occurs over the long term: greater than 20 years.
Frequency	The rate of occurrence of the residual effect	**Level I:** Effect occurs once, infrequently or not at all. **Level II:** Effect occurs intermittently or with a certain degree of regularity. **Level III:** Effect occurs frequently or continuously.
Reversibility	The extent to which the residual effect can be reversed	**Level I:** Effect is fully reversible. **Level II:** Effect is partially reversible or potentially reversible with difficulty. **Level III:** Effect is not reversible.
Timing	A measure of whether the residual effect occurs during a sensitive period of the year	**Level I:** Effects do not occur during a sensitive period, or related effects are fully mitigated. **Level II:** Effects occur during a sensitive period, and related effects are partially mitigated. **Level III:** Effects occur during a sensitive period, or related effects cannot be fully mitigated.

Table 6.15-3: Mean Cavity Tree Density and the Number of Plots Surveyed within Each Ecosite

Ecosite	Mean Snag Density	Number of Plots Sampled
B024	60	2
B034	70	2
B049	67	27
B050	42	51
B052	34	7
B055	37	26
B065	140	1
B070	57	7
B088	20	4
B104	63	7
B119	93	6
B127	20	1
B128	43	20
B140	20	2

Table 6.15-4: Potential Interactions of Project Components with Bats

Project Component / Activity	Bats
Construction Phase	
Site preparation activities including clearing, grubbing and bulk earthworks	Yes
Construction of the mine site access road and airstrip, including the development and operation of aggregate resource areas	Yes
Development of temporary construction camp and staging areas	Yes
Construction of the fish habitat development area	Yes
Construction of the transmission line to the Project site	Yes
Construction of the onsite haul and access roads	Yes
Construction of the dikes in the north basin of Springpole Lake	Yes
Construction of buildings and onsite infrastructure	Yes
Construction of the central water storage pond	Yes
Controlled dewatering of the open pit basin	Yes
Construction of the starter embankments for the CDF	Yes
Stripping of lake bed sediment and overburden at the open pit	Yes
Development of the surficial soil stockpile	Yes
Initiation of pit development in rock	Yes
Initiation of stockpiling of ore	Yes
Establishment and operation of water management and treatment facilities	Yes
Commissioning of the process plant	Yes
Employment and Expenditures	-
Operation Phase	
Operation of the process plant	Yes
Operation of open pit mine	Yes
Management of overburden, mine rock, tailings and ore in designated facilities	Yes-
Operation of water management and treatment facilities	Yes
Accommodations complex operations	-
Operation and maintenance of mine site infrastructure	Yes
Progressive reclamation activities	Yes
Employment and Expenditures	-
Decommissioning and Closure Phase	
Removal of assets that can be salvaged	-
Demolition and recycling and/or disposal of remaining materials	-
Removal and disposal of demolition-related wastes in approved facilities	-
Reclamation of impacted areas, such as by regrading, placement of cover, and revegetation	Yes
Filling the open pit with water	Yes
Monitoring and maintenance	-
Employment and Expenditures	-

Note:

- = The interaction is not expected, and no further assessment is warranted.

Table 6.15-5: Proposed Mitigation Measures for Potential Bat Effects

	Phase			
Pathways to Potential Effect / Criteria	**Con.**	**Op.**	**Cl.**	**Proposed Mitigation Measure**
Change in habitat	•	–	–	Develop a compact mine site to limit the areal extent of disturbance.
	•	–	–	Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
	•	–	–	Avoid the removal of bat maternity habitat between April 15 and August 31 during the construction phase, unless authorized under an ESA or other appropriate approval.
	•	–	–	Follow appropriate timing windows for vegetation removals; in combination with timing windows for wildlife and wildlife habitat (6.12), Boreal Caribou (6.13), Wolverine (6.14), and SAR birds (6.16), vegetation removals should only occur between September 15 to January 14.
	•	•	–	During construction and operation phases, avoid the removal / disturbance of foraging habitat within 2.6 km of candidate bat hibernacula, unless authorized under an ESA or other appropriate approval.
	•	•	•	Undertake offsetting measures for bats such as establishing artificial hibernacula, as required by relevant ESA approvals.
	•	•	•	Implementation of mitigation measures for potential effects on wildlife and wildlife habitat relevant to bats (Section 6.12.4) including: • During construction of the Project, minimize the disturbance by using existing trails and roads for travel, where practical. • During the operation phase of the transmission line, minimize vegetation management to that necessary for safe operation.
	•	•	•	Implementation of mitigation measures for potential effects on vegetation communities and wetlands relevant to bats (Section 6.2.4) including: • During construction and operation, minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation; • During construction and operation, minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs; and, • During operation and closure phases, undertake progressive and final rehabilitation of mine development in accordance with the filed Closure Plan, and implement a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and wildlife habitat features including bats.

Table 6.15-5: Proposed Mitigation Measures for Potential Bat Effects

	Phase			
Pathways to Potential Effect / Criteria	**Con.**	**Op.**	**Cl.**	**Proposed Mitigation Measure**
Change in function, connectivity and quality of habitat	•	–	–	Develop a compact mine site to limit the areal extent of disturbance.
	•	–	–	Co-locate the transmission line, airstrip and mine access road within a shared infrastructure corridor, where feasible.
	•	–	–	Avoid the removal of bat maternity habitat between April 15 and August 31 during the construction phase, unless authorized under an ESA approval.
	•	•	–	Maintain a 500 m radius of uncleared habitat around the entrance for confirmed bat hibernacula, unless otherwise authorized under an ESA approval.
	•	•	–	Avoid the removal / disturbance of foraging habitat within 2.6 km of confirmed bat hibernacula, unless authorized under an ESA approval.
	•	•	•	Undertake offsetting measures for bats such as establishing artificial hibernacula, as required by relevant ESA approvals.
	•	•	•	Implementation of mitigation measures for potential effects on air quality relevant to bats (Section 6.2.4) including: • During construction, operation and active closure, a dust management plan will be implemented to identify potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed. • Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray and supplemented by dust suppressants, if required; • Site roads will be maintained in good condition, with regular inspections and timely maintenance completed to minimize the silt loading on the roads; and, • Vehicle speeds will be limited.
	•	•	•	Implement the mitigation measures for potential effects on noise relevant to bats (Section 6.3.4), including: • Building dimensions, layout and orientation will be designed to shield noise sources, where possible. • Acoustical enclosures will be used in the process plant to limit overall noise emissions from key noise sources, such as the ball mills. • Generator intakes and exhausts in the process plant will use silencers. • Motorized equipment will be selected or designed with mufflers / silencers to limit noise emissions during all phases of the Project

Table 6.15-5: Proposed Mitigation Measures for Potential Bat Effects

Pathways to Potential Effect / Criteria	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
				• Reversing alarms should be dimmable with white noise and/or strobe lights, but in accordance with the applicable health and safety regulations, during all phases of the Project • The use of engine brakes will be prohibited. • Vehicles and equipment will be operated in such a way that impulsive noise is minimized, where possible, during all phases of the Project • Regular inspections will take place to confirm that equipment and machinery used on site is operated in good working condition through regular maintenance. • For helicopter use during transmission line construction, minimum flight altitudes will be maintained unless the helicopters are engaged in construction tasks, landing or departure.
	•	•	•	Implement mitigation measures for lighting to minimize sensory disturbance, including: • To prevent a direct line-of-sight from light, maintain light sources below natural barriers such as tree lines or artificial barriers such as berms; and • Minimize light spill and glare using shielding on stationary light sources and direct lighting downwards where practicable.
	•	•	•	Implement the mitigation measures for potential effects on surface water relevant to bats (Section 6.6.4, Section 6.7.4 and 6.8.4), including. • During construction, operation and active closure, an erosion and sediment control (ESC) plan will be implemented to manage runoff water in disturbed areas. • During construction, operation and active closure, an integrated water management system will be designed to collect and control contact water. • Water collection ditches will be constructed and operated around the perimeter of infrastructure, including the CDF and stockpiles to collect overland flow and seepage and direct it to the integrated water management system. • Non-contact water will be diverted away from Project components using ditches, diversion berms and other suitable measures. • Collected contact water that is not recycled in ore processing will be treated at the effluent treatment plant and discharged to the southeast arm of Springpole Lake in accordance with permitting requirements.
	•	•	•	Implementation of mitigation measures for potential effects on vegetation communities and wetlands relevant to bats (Section 6.2.4) including:

Table 6.15-5: Proposed Mitigation Measures for Potential Bat Effects

Pathways to Potential Effect / Criteria	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
				• During construction and operation, minimize the clearing of vegetation within the mine access road and transmission line corridor to that needed for the construction and safe operation; • During construction and operation, minimize the removal of woody vegetation within the transmission line corridor to maintain natural cover to adjacent areas. The removal of woody vegetation will be limited to hazard trees and clearing to provide safe construction access and infrastructure needs; • During construction, operation and active closure phases, implement mitigation measures for wetlands; and, • During operation and closure phases, undertake progressive and final rehabilitation of mine development in accordance with the filed Closure Plan, and implement a revegetation plan that preferentially uses local vegetation sources, incorporates plant species of interest to Indigenous communities, and wildlife habitat features including bats.
	•	•	•	Implementation of mitigation measures for potential effects on wildlife and wildlife habitat relevant to bats (Section 6.12.4) including: • During construction, operation and closure phases of the Project, domestic solid waste products and similar materials will be properly secured, stored and disposed of at an offsite licensed facility, particularly anything that is an attractant for scavenging wildlife. Domestic solid waste products will be transported to a landfill off site, mitigating the habitat sink effect of increased predator densities that can be created due to access to landfill sites. • During construction of the Project, minimize the disturbance by using existing trails and roads for travel, where practical. • During the operation phase of the mine access road, enforce reduced speed limits along Project-controlled roads within high-quality wildlife habitats, particularly along segments with known or recurrent wildlife crossings; • During the operation phase of the mine access road, Project-related vehicles travelling on the mine access road must come to a stop if wildlife is encountered and provide them with the right-of-way to cross the road; and • During the operation phase of the transmission line, minimize vegetation management to that necessary for safe operation.

Table 6.15-5: Proposed Mitigation Measures for Potential Bat Effects

Pathways to Potential Effect / Criteria	Phase			Proposed Mitigation Measure
	Con.	Op.	Cl.	
				• During construction, operation and closure phases, wildlife (including SAR) awareness training will be provided to Project employees. • During construction, operation and closure phases, log (and report as needed) observed wildlife, sign / tracks and wildlife–vehicle collisions and alter mitigation measures as appropriate.
Change in the risk of mortality	●	–	–	Avoid the removal of bat maternity habitat between April 15 and August 31 during the construction phase, unless authorized under an ESA approval.
	●	●	–	Maintain a 500 m radius of uncleared habitat around the entrance for confirmed bat hibernacula, unless otherwise authorized under an ESA approval.
	●	●	–	Avoid the removal / disturbance of foraging habitat within 2.6 km of confirmed bat hibernacula, unless authorized under an ESA approval.
	●	●	●	Implementation of mitigation measures for potential effects on wildlife and wildlife habitat relevant to bats (Section 6.12.4) including: • During construction, operation and closure phases of the Project, domestic solid waste products and similar materials will be properly secured, stored and disposed of at an offsite licensed facility, particularly anything that is an attractant for scavenging wildlife. Domestic solid waste products will be transported to a landfill off site, mitigating the habitat sink effect of increased predator densities that can be created due to access to landfill sites. • During the operation phase of the mine access road, enforce reduced speed limits along Project-controlled roads within high-quality wildlife habitats, particularly along segments with known or recurrent wildlife crossings; • During the operation phase of the mine access road, Project-related vehicles travelling on the mine access road must come to a stop if wildlife is encountered and provide them with the right-of-way to cross the road; and • During construction, operation and closure phases, wildlife (including SAR) awareness training will be provided to Project employees. • During construction, operation and closure phases, log (and report as needed) observed wildlife, sign / tracks and wildlife–vehicle collisions and alter mitigation measures as appropriate.

Notes:
Con = construction; Op = operation; Cl = closure; ● = mitigation is applicable; – = mitigation is not applicable.

Table 6.15-6: Habitat Assessment for Bats during Construction Relative to Baseline Conditions

PDA														
Habitat Type		Ecosite	Baseline Condition (area, in ha)[1]						Condition during Mine Operation (area, in ha)[2]				Change in Cover Type[3]	
			PDA	%	LSA	%	RSA	%	LSA	%	RSA	%	LSA	RSA
Maternity habitat	Sparse treed	B011	0.00	0%	0.00	0.00%	2.77	0.00%	0.00	0.00%	2.77	0.00%	0.00%	0.00%
		B012	1.29	0%	306.22	1.32%	4,721.61	0.91%	304.93	1.57%	4,720.32	1.02%	-0.42%	-0.03%
		B024	0.00	0%	6.72	0.03%	6.72	0.00%	6.72	0.03%	6.72	0.00%	0.00%	0.00%
		B034	0.00	0%	39.67	0.17%	5,720.54	1.10%	39.67	0.20%	5,720.54	1.24%	0.00%	0.00%
		B035	0.00	0%	0.00	0.00%	555.05	0.11%	0.00	0.00%	555.05	0.12%	0.00%	0.00%
		B037	0.00	0%	23.48	0.10%	61.34	0.01%	23.48	0.12%	61.34	0.01%	0.00%	0.00%
		B040	0.00	0%	0.00	0.00%	67.16	0.01%	0.00	0.00%	67.16	0.01%	0.00%	0.00%
	Coniferous treed	B048	0.00	0%	0.00	0.00%	206.06	0.04%	0.00	0.00%	206.06	0.04%	0.00%	0.00%
		B049	483.23	28%	9,744.39	41.95%	227,209.20	43.74%	9,261.16	47.55%	226,725.98	49.06%	-4.96%	-0.21%
		B050	478.43	28%	3,234.36	13.92%	50,704.25	9.76%	2,755.93	14.15%	50,225.82	10.87%	-14.79%	-0.94%
		B052	134.90	8%	363.55	1.57%	2,094.69	0.40%	228.65	1.17%	1,959.79	0.42%	-37.11%	-6.44%
		B053	0.00	0%	0.00	0.00%	7.07	0.00%	0.00	0.00%	7.07	0.00%	0.00%	0.00%
		B064	0.00	0%	0.00	0.00%	2.24	0.00%	0.00	0.00%	2.24	0.00%	0.00%	0.00%
		B065	40.39	2%	896.82	3.86%	27,344.02	5.26%	856.44	4.40%	27,303.64	5.91%	-4.50%	-0.15%
		B067	0.00	0%	0.00	0.00%	73.40	0.01%	0.00	0.00%	73.40	0.02%	0.00%	0.00%
		B068	0.00	0%	0.00	0.00%	30.54	0.01%	0.00	0.00%	30.54	0.01%	0.00%	0.00%
		B082	0.00	0%	8.99	0.04%	404.06	0.08%	8.99	0.05%	404.06	0.09%	0.00%	0.00%
		B083	0.00	0%	0.00	0.00%	269.79	0.05%	0.00	0.00%	269.79	0.06%	0.00%	0.00%
		B085	0.00	0%	0.00	0.00%	31.18	0.01%	0.00	0.00%	31.18	0.01%	0.00%	0.00%
		B098	4.72	0%	357.76	1.54%	3,996.35	0.77%	353.03	1.81%	3,991.63	0.86%	-1.32%	-0.12%
		B099	0.37	0%	136.36	0.59%	2,377.27	0.46%	135.99	0.70%	2,376.90	0.51%	-0.27%	-0.02%
		B101	0.77	0%	25.29	0.11%	502.20	0.10%	24.52	0.13%	501.43	0.11%	-3.04%	-0.15%
		B114	0.00	0%	7.69	0.03%	1,165.43	0.22%	7.69	0.04%	1,165.43	0.25%	0.00%	0.00%
		B116	0.00	0%	0.00	0.00%	73.92	0.01%	0.00	0.00%	73.92	0.02%	0.00%	0.00%
	Deciduous treed (including mixed treed)	B054	0.00	0%	0.00	0.00%	2.35	0.00%	0.00	0.00%	2.35	0.00%	0.00%	0.00%
		B055	242.86	14%	761.46	3.28%	10,115.42	1.95%	518.59	2.66%	9,872.55	2.14%	-31.89%	-2.40%
		B070	0.00	0%	4.20	0.02%	522.79	0.10%	4.20	0.02%	522.79	0.11%	0.00%	0.00%
		B088	0.00	0%	0.00	0.00%	173.30	0.03%	0.00	0.00%	173.30	0.04%	0.00%	0.00%
		B104	1.13	0%	138.65	0.60%	978.99	0.19%	137.52	0.71%	977.86	0.21%	-0.81%	-0.12%
		B119	0.00	0%	0.00	0.00%	254.27	0.05%	0.00	0.00%	254.27	0.06%	0.00%	0.00%
	Coniferous swamp	B127	56.21	3%	1,004.81	4.33%	21,580.81	4.15%	948.59	4.87%	21,524.60	4.66%	-5.59%	-0.26%
		B128	232.95	13%	4,093.49	17.62%	101,902.02	19.62%	3,860.54	19.82%	101,669.07	22.00%	-5.69%	-0.23%
		B129	0.00	0%	0.00	0.00%	279.38	0.05%	0.00	0.00%	279.38	0.06%	0.00%	0.00%
		B222	0.00	0%	0.00	0.00%	171.98	0.03%	0.00	0.00%	171.98	0.04%	0.00%	0.00%
		B223	0.00	0%	0.00	0.00%	102.52	0.02%	0.00	0.00%	102.52	0.02%	0.00%	0.00%
		B224	0.00	0%	0.00	0.00%	18.43	0.00%	0.00	0.00%	18.43	0.00%	0.00%	0.00%
	Deciduous swamp	B130	0.00	0%	0.00	0.00%	33.03	0.01%	0.00	0.00%	33.03	0.01%	0.00%	0.00%
		B133	0.00	0%	0.00	0.00%	32.75	0.01%	0.00	0.00%	32.75	0.01%	0.00%	0.00%
Maternity Habitat Total[4]			1,677.25	96.75%	21,154	91.07%	463,794.93	89.28%	19,477	100.00%	462,117.68	100.00%	-7.93%	-0.36%
Foraging Habitat[5]			469.0347887	27.06%	10,670.28	45.94%	218,140.23	41.99%	10,201.25	100.00%	217,671.19	100.00%	-4.40%	-0.22%
Foraging Habitat Total[4]			469.03	27.06%	10,670.28	45.94%	218,140.23	41.99%	10,201	100.00%	217,671.19	100.00%	-4.40%	-0.22%

Notes:

(1) Refers to the condition prior to mine development.

(2) Refers to the conditions after the mine has been developed for operation (i.e., the removal of vegetation in the PDA footprint).

(3) Change in Cover Type is calculated as =([Condition during Mine Operations – Baseline Condition]/Baseline Condition. In Subtotal rows, Change in Cover Type is not summed but calculated based on the sums of the row.

(4) Within the PDA's 2,026.33 ha, 1,733.56 ha are represented in FRI ecosites. The LSA and RSA, spanning 30,773.41 ha and 628,311.38 ha respectively, have 23,228.22 ha and 519,473.30 ha captured in FRI ecosites.

(5) Foraging habitat includes: A 40 m buffer around all maternity habitat, a 40 m buffer along the inside of all lake edges, a 2 m buffer around any stream, a 2,600 m buffer around candidate hibernacula and any forest, wetland or pond not identified as maternity habitat.

Table 6.15-7: Habitat Assessment for Bats: Operational Changes due to Groundwater Relative to Baseline Conditions

Habitat Type	Ecosite Group	Ecosite	Baseline Condition (area, in ha)[1]			Zone of Influence from Groundwater Management (area, in ha)[2]				
			PDA[4]	LSA	RSA	Pit Dewatering Drawdown Area	Area within LSA	Area within RSA	LSA % Change[3]	RSA % Change[3]
Maternity habitat	Sparse treed	B011	0.00	0.00	2.77	0.00	0.00	2.77	0.00%	0.00%
		B012	1.29	306.22	4721.61	0.00	306.22	4721.61	0.00%	0.00%
		B024	0.00	6.72	6.72	0.00	6.72	6.72	0.00%	0.00%
		B034	0.00	39.67	5720.54	0.00	39.67	5720.54	0.00%	0.00%
		B035	0.00	0.00	555.05	0.00	0.00	555.05	0.00%	0.00%
		B037	0.00	23.48	61.34	0.00	23.48	61.34	0.00%	0.00%
		B040	0.00	0.00	67.16	0.00	0.00	67.16	0.00%	0.00%
	Coniferous treed	B048	0.00	0.00	206.06	0.00	0.00	206.06	0.00%	0.00%
		B049	483.23	9744.39	227209.20	93.63	9650.76	227115.57	-0.96%	-0.04%
		B050	478.43	3234.36	50704.25	196.60	3037.76	50507.66	-6.08%	-0.39%
		B052	134.90	363.55	2094.69	79.48	284.07	2015.21	-21.86%	-3.79%
		B053	0.00	0.00	7.07	0.00	0.00	7.07	0.00%	0.00%
		B064	0.00	0.00	2.24	0.00	0.00	2.24	0.00%	0.00%
		B065	40.39	896.82	27344.02	17.88	878.95	27326.14	-1.99%	-0.07%
		B067	0.00	0.00	73.40	0.00	0.00	73.40	0.00%	0.00%
		B068	0.00	0.00	30.54	0.00	0.00	30.54	0.00%	0.00%
		B082	0.00	8.99	404.06	0.00	8.99	404.06	0.00%	0.00%
		B083	0.00	0.00	269.79	0.00	0.00	269.79	0.00%	0.00%
		B085	0.00	0.00	31.18	0.00	0.00	31.18	0.00%	0.00%
		B098	4.72	357.76	3996.35	0.00	357.76	3996.35	0.00%	0.00%
		B099	0.37	136.36	2377.27	0.00	136.36	2377.27	0.00%	0.00%
		B101	0.77	25.29	502.20	0.00	25.29	502.20	0.00%	0.00%
		B114	0.00	7.69	1165.43	0.00	7.69	1165.43	0.00%	0.00%
		B116	0.00	0.00	73.92	0.00	0.00	73.92	0.00%	0.00%
	Deciduous treed (including mixed treed)	B054	0.00	0.00	2.35	0.00	0.00	2.35	0.00%	0.00%
		B055	242.86	761.46	10115.42	111.29	650.16	10004.12	-14.62%	-1.10%
		B070	0.00	4.20	522.79	0.00	4.20	522.79	0.00%	0.00%
		B088	0.00	0.00	173.30	0.00	0.00	173.30	0.00%	0.00%
		B104	1.13	138.65	978.99	0.00	138.65	978.99	0.00%	0.00%
		B119	0.00	0.00	254.27	0.00	0.00	254.27	0.00%	0.00%
	Coniferous swamp	B127	56.21	1004.81	21580.81	11.19	993.61	21569.62	-1.11%	-0.05%
		B128	232.95	4093.49	101902.02	60.12	4033.37	101841.90	-1.47%	-0.06%
		B129	0.00	0.00	279.38	0.00	0.00	279.38	0.00%	0.00%
		B222	0.00	0.00	171.98	0.00	0.00	171.98	0.00%	0.00%
		B223	0.00	0.00	102.52	0.00	0.00	102.52	0.00%	0.00%
		B224	0.00	0.00	18.43	0.00	0.00	18.43	0.00%	0.00%
	Deciduous swamp	B130	0.00	0.00	33.03	0.00	0.00	33.03	0.00%	0.00%
		B133	0.00	0.00	32.75	0.00	0.00	32.75	0.00%	0.00%
Maternity Habitat Total[4]			**1,677.25**	**21,153.90**	**463,794.93**	**570.20**	**20583.70**	**463224.74**	**-2.70%**	**-0.12%**
Foraging Habitat Total[4][5]			**469.03**	**10670.28**	**218140.23**	**147.91**	**321.13**	**217992.32**	**-96.99%**	**-0.07%**

Notes:

(1) Refers to the condition prior to mine development.

(2) Refers to the conditions after the mine has been developed for operation (i.e., the removal of the PDA footprint in GIS analysis).

(3) LSA/RSA % is calculated as = ([Condition during Mine Operations – Baseline Condition]/Baseline Condition). In Subtotal rows, Change in Cover Type is not summed but calculated based on the sums of the row.

(4) The PDA has an area of 2,026.33 ha of which 1,713.76 ha are captured in FRI ecosites.

(5) Foraging habitat includes: A 40 m buffer around all maternity habitat, a 40 m buffer along the inside of all lake edges, a 2 m buffer around any stream, a 2,600 m buffer around candidate hibernacula and any forest, wetland or pond not identified as maternity habitat.

Table 6.15-8: Habitat Assessment for Bats: Operational Changes due to Air Quality Relative to Baseline Conditions

Habitat Type	Ecosite Group	Ecosite	Baseline Condition (area, in ha) [1]		Zone of Influence from Changes in Air Quality (area, in ha)[2]					
			PDA	LSA	RSA	Air Quality Effects	Area within LSA	Area within RSA	LSA % Change[3]	RSA % Change[3]
Maternity habitat	Sparse treed	B011	0.00	0.00	2.77	0.00	0.00	2.77	0.00%	0.00%
		B012	1.29	306.22	4721.61	0.00	306.22	4721.61	0.00%	0.00%
		B024	0.00	6.72	6.72	0.00	6.72	6.72	0.00%	0.00%
		B034	0.00	39.67	5720.54	0.00	39.67	5720.54	0.00%	0.00%
		B035	0.00	0.00	555.05	0.00	0.00	555.05	0.00%	0.00%
		B037	0.00	23.48	61.34	0.00	23.48	61.34	0.00%	0.00%
		B040	0.00	0.00	67.16	0.00	0.00	67.16	0.00%	0.00%
	Coniferous treed	B048	0.00	0.00	206.06	0.00	0.00	206.06	0.00%	0.00%
		B049	483.23	9744.39	227209.20	219.64	9524.75	226989.57	-2.25%	-0.10%
		B050	478.43	3234.36	50704.25	518.15	2716.20	50186.10	-16.02%	-1.02%
		B052	134.90	363.55	2094.69	206.72	156.83	1887.97	-56.86%	-9.87%
		B053	0.00	0.00	7.07	0.00	0.00	7.07	0.00%	0.00%
		B064	0.00	0.00	2.24	0.00	0.00	2.24	0.00%	0.00%
		B065	40.39	896.82	27344.02	32.33	864.49	27311.69	-3.61%	-0.12%
		B067	0.00	0.00	73.40	0.00	0.00	73.40	0.00%	0.00%
		B068	0.00	0.00	30.54	0.00	0.00	30.54	0.00%	0.00%
		B082	0.00	8.99	404.06	0.00	8.99	404.06	0.00%	0.00%
		B083	0.00	0.00	269.79	0.00	0.00	269.79	0.00%	0.00%
		B085	0.00	0.00	31.18	0.00	0.00	31.18	0.00%	0.00%
		B098	4.72	357.76	3996.35	0.00	357.76	3996.35	0.00%	0.00%
		B099	0.37	136.36	2377.27	0.00	136.36	2377.27	0.00%	0.00%
		B101	0.77	25.29	502.20	0.00	25.29	502.20	0.00%	0.00%
		B114	0.00	7.69	1165.43	0.00	7.69	1165.43	0.00%	0.00%
		B116	0.00	0.00	73.92	0.00	0.00	73.92	0.00%	0.00%
	Deciduous treed (including mixed treed)	B054	0.00	0.00	2.35	0.00	0.00	2.35	0.00%	0.00%
		B055	242.86	761.46	10115.42	261.65	499.81	9853.77	-34.36%	-2.59%
		B070	0.00	4.20	522.79	0.00	4.20	522.79	0.00%	0.00%
		B088	0.00	0.00	173.30	0.00	0.00	173.30	0.00%	0.00%
		B104	1.13	138.65	978.99	0.00	138.65	978.99	0.00%	0.00%
		B119	0.00	0.00	254.27	0.00	0.00	254.27	0.00%	0.00%
	Coniferous swamp	B127	56.21	1004.81	21580.81	34.38	970.43	21546.43	-3.42%	-0.16%
		B128	232.95	4093.49	101902.02	191.32	3902.17	101710.71	-4.67%	-0.19%
		B129	0.00	0.00	279.38	0.00	0.00	279.38	0.00%	0.00%
		B222	0.00	0.00	171.98	0.00	0.00	171.98	0.00%	0.00%
		B223	0.00	0.00	102.52	0.00	0.00	102.52	0.00%	0.00%
		B224	0.00	0.00	18.43	0.00	0.00	18.43	0.00%	0.00%
	Deciduous swamp	B130	0.00	0.00	33.03	0.00	0.00	33.03	0.00%	0.00%
		B133	0.00	0.00	32.75	0.00	0.00	32.75	0.00%	0.00%
Maternity Habitat Total[4]		**1,677.25**	**21,153.90**		**463,794.93**	**1464.19**	**19689.71**	**462330.74**	**-6.92%**	**-0.32%**
Foraging Habitat Total[4][5]		**469.03**	**10670.28**		**218140.23**	**537.0045**	**10133.28**	**217603.22**	**-5.03%**	**-0.25%**

Notes:

(1) Refers to the condition prior to mine development.

(2) Refers to the conditions after the mine has been developed for operation (i.e., the removal of the PDA footprint in GIS analysis).

(3) LSA / RSA % is calculated as = ([Condition during Mine Operations – Baseline Condition]/Baseline Condition). In Subtotal rows, Change in Cover Type is not summed but calculated based on the sums of the row.

(4) The PDA has an area of 2,026.33 ha of which 1,713.76 ha are captured in FRI ecosites.

(5) Foraging habitat includes: A 40 m buffer around all maternity habitat, a 40 m buffer along the inside of all lake edges, a 2 m buffer around any stream, a 2,600 m buffer around candidate hibernacula and any forest, wetland or pond not identified as maternity habitat.

Table 6.15-9: Habitat Assessment for Bats: Operational Changes Due to Noise Relative to Baseline Conditions

Habitat Type	Ecosite Group	Ecosite	Baseline Condition (area, in ha) [1]			Zone of Influence from Changes in Sound Levels (area, in ha)[2]				
			PDA	LSA	RSA	Noise Effects	Area within LSA	Area within RSA	LSA % Change(1)	RSA % Change(1)
Maternity Habitat	Sparse treed	B011	0.00	0.00	2.77	0.00	0.00	2.77	0.00	0.00
		B012	1.29	306.22	4721.61	0.00	306.22	4721.61	0.00	0.00
		B024	0.00	6.72	6.72	0.00	6.72	6.72	0.00	0.00
		B034	0.00	39.67	5720.54	0.00	39.67	5720.54	0.00	0.00
		B035	0.00	0.00	555.05	0.00	0.00	555.05	0.00	0.00
		B037	0.00	23.48	61.34	0.00	23.48	61.34	0.00	0.00
		B040	0.00	0.00	67.16	0.00	0.00	67.16	0.00	0.00
	Coniferous treed	B048	0.00	0.00	206.06	0.00	0.00	206.06	0.00	0.00
		B049	483.23	9744.39	227209.20	708.05	9036.34	226501.15	-0.07	0.00
		B050	478.43	3234.36	50704.25	729.28	2505.08	49974.97	-0.23	-0.01
		B052	134.90	363.55	2094.69	176.02	187.52	1918.66	-0.48	-0.08
		B053	0.00	0.00	7.07	0.00	0.00	7.07	0.00	0.00
		B064	0.00	0.00	2.24	0.00	0.00	2.24	0.00	0.00
		B065	40.39	896.82	27344.02	65.41	831.41	27278.61	-0.07	0.00
		B067	0.00	0.00	73.40	0.00	0.00	73.40	0.00	0.00
		B068	0.00	0.00	30.54	0.00	0.00	30.54	0.00	0.00
		B082	0.00	8.99	404.06	0.00	8.99	404.06	0.00	0.00
		B083	0.00	0.00	269.79	0.00	0.00	269.79	0.00	0.00
		B085	0.00	0.00	31.18	3.02	-3.02	28.17	0.00	-0.10
		B098	4.72	357.76	3996.35	0.00	357.76	3996.35	0.00	0.00
		B099	0.37	136.36	2377.27	0.00	136.36	2377.27	0.00	0.00
		B101	0.77	25.29	502.20	0.00	25.29	502.20	0.00	0.00
		B114	0.00	7.69	1165.43	0.00	7.69	1165.43	0.00	0.00
		B116	0.00	0.00	73.92	0.00	0.00	73.92	0.00	0.00
	Deciduous treed (including mixed treed)	B054	0.00	0.00	2.35	0.00	0.00	2.35	0.00	0.00
		B055	242.86	761.46	10115.42	407.35	354.11	9708.07	-0.53	-0.04
		B070	0.00	4.20	522.79	0.00	4.20	522.79	0.00	0.00
		B088	0.00	0.00	173.30	0.00	0.00	173.30	0.00	0.00
		B104	1.13	138.65	978.99	0.09	138.55	978.89	0.00	0.00
		B119	0.00	0.00	254.27	0.00	0.00	254.27	0.00	0.00
	Coniferous swamp	B127	56.21	1004.81	21580.81	41.41	963.40	21539.40	-0.04	0.00
		B128	232.95	4093.49	101902.02	303.72	3789.77	101598.31	-0.07	0.00
		B129	0.00	0.00	279.38	0.00	0.00	279.38	0.00	0.00
		B222	0.00	0.00	171.98	0.00	0.00	171.98	0.00	0.00
		B223	0.00	0.00	102.52	0.00	0.00	102.52	0.00	0.00
		B224	0.00	0.00	18.43	0.00	0.00	18.43	0.00	0.00
	Deciduous Swamp	B130	0.00	0.00	33.03	0.00	0.00	33.03	0.00	0.00
		B133	0.00	0.00	32.75	0.00	0.00	32.75	0.00	0.00
Maternity Habitat Total[4]			**1677.25**	**21153.90**	**463794.93**	**2434.34**	**18719.56**	**461360.59**	**-0.12**	**-0.01**
Foraging Habitat Total[4][5]			**469.03**	**10670.28**	**218140.23**	**3056.73**	**7613.55**	**215083.50**	**-0.29**	**-0.01**

Notes:

(1) Refers to the condition prior to mine development.

(2) Refers to the conditions after the mine has been developed for operation (i.e., the removal of the PDA footprint in GIS analysis).

(3) LSA / RSA % is calculated as = ([Condition during Mine Operations – Baseline Condition]/Baseline Condition). In Subtotal rows, Change in Cover Type is not summed but calculated based on the sums of the row.

(4) The PDA has an area of 2,026.33 ha of which 1,713.76 ha are captured in FRI ecosites.

(5 Foraging habitat includes: A 40 m buffer around all maternity habitat, a 40 m buffer along the inside of all lake edges, a 2 m buffer around any stream, a 2,600 m buffer around candidate hibernacula and any forest, wetland or pond not identified as maternity habitat.

480000 500000 520000 540000 560000 580000 600000 620000 640000 660000 680000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Zionz Lake
Birch Lake
Springpole Lake
Fawcett Lake
Wright Lake
Gull Lake
Shabumeni Lake
Seagrave Lake
Kezik Lake
Fry Lake
Narrow Lake
Woman Lake
Okanse Lake
Trout Lake
SLATE FALLS NATION
Joyce Lake
Perrigo Lake
Bamaji Lake
Jeanette Lake
Blackstone Lake
Confederation Lake
Lake St. Joseph
Little Trout Lake
Doran Lake
Slate Lake
Otatakan Lake
Whitemud Lake
Miniss Lake
Bruce Lake
Bluffy Lake
De Lesseps Lake
St. Raphael Lake

LEGEND

- Proposed Mine Feature
- Project Development Area
- Local Study Area for Bats
- Regional Study Area for Bats
- First Nation Reserve
- Fire Disturbance Burn Area
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1, 26 June 2023 and modified by WSP July 2023.
- Fire disturbance burn areas extracted from Ontario GeoHub (Land Information Ontario, 2023)

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

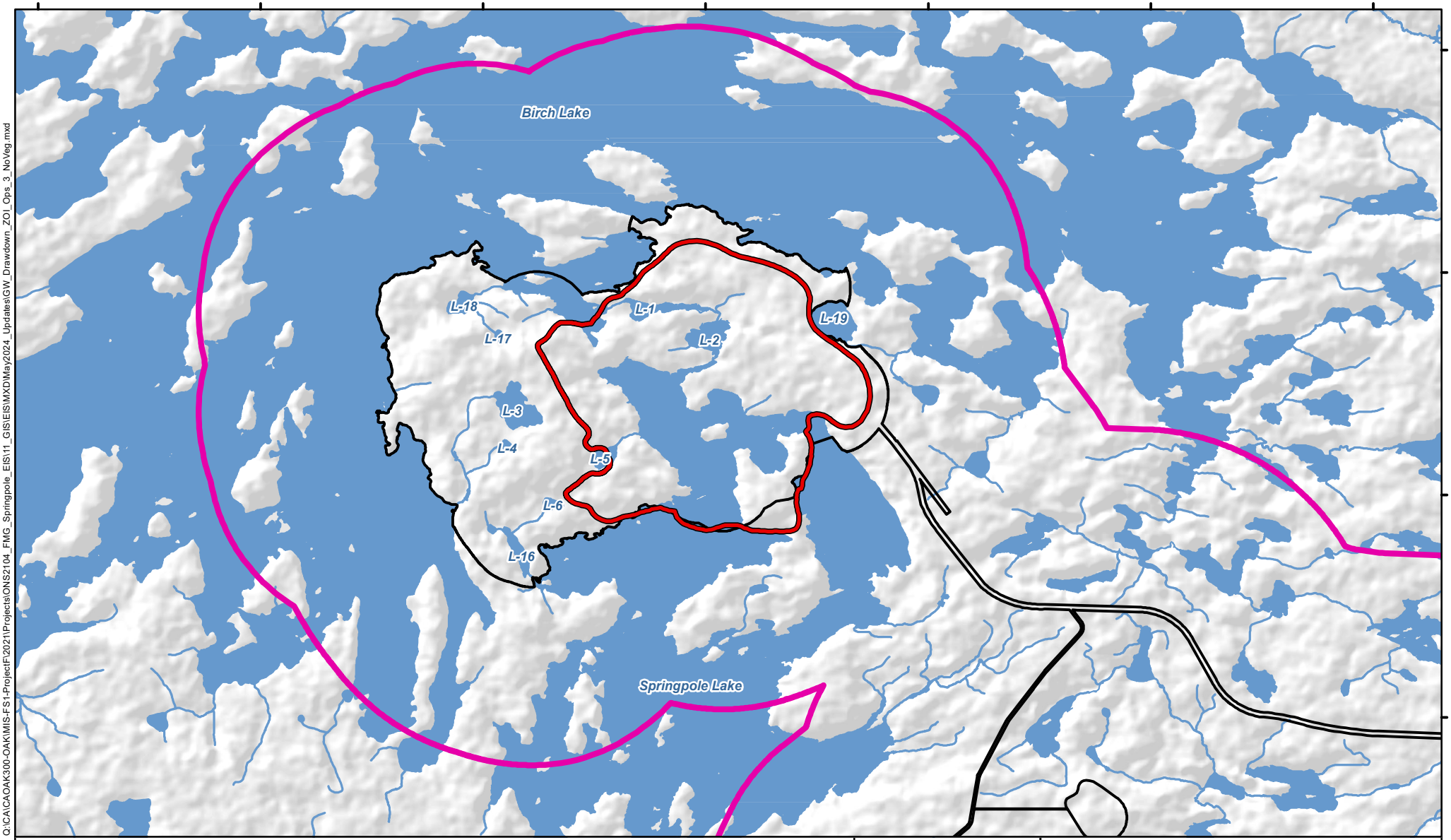
Local and Regional Study Areas for Bats

PROJECT N°: ONS2104

FIGURE: 6.15-1

SCALE: 1:500,000

DATE: May 2024



Q:\CA\CA\OAK300-OAK\MIS-FS1-Project\FI2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\EIS\MXD\May2024_Updates\GW_Drawdown_ZOI_Ops_3_NoVeg.mxd

LEGEND

- Proposed Mine Feature
- Groundwater 2 m Drawdown Zone of Influence (Nov. 2023 Model)
- Local Study Area for Bats
- Waterbody
- Watercourse

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023

Datum: NAD83
Projection: UTM Zone 15N

0 0.5 1 2 3 4 5 Kilometres

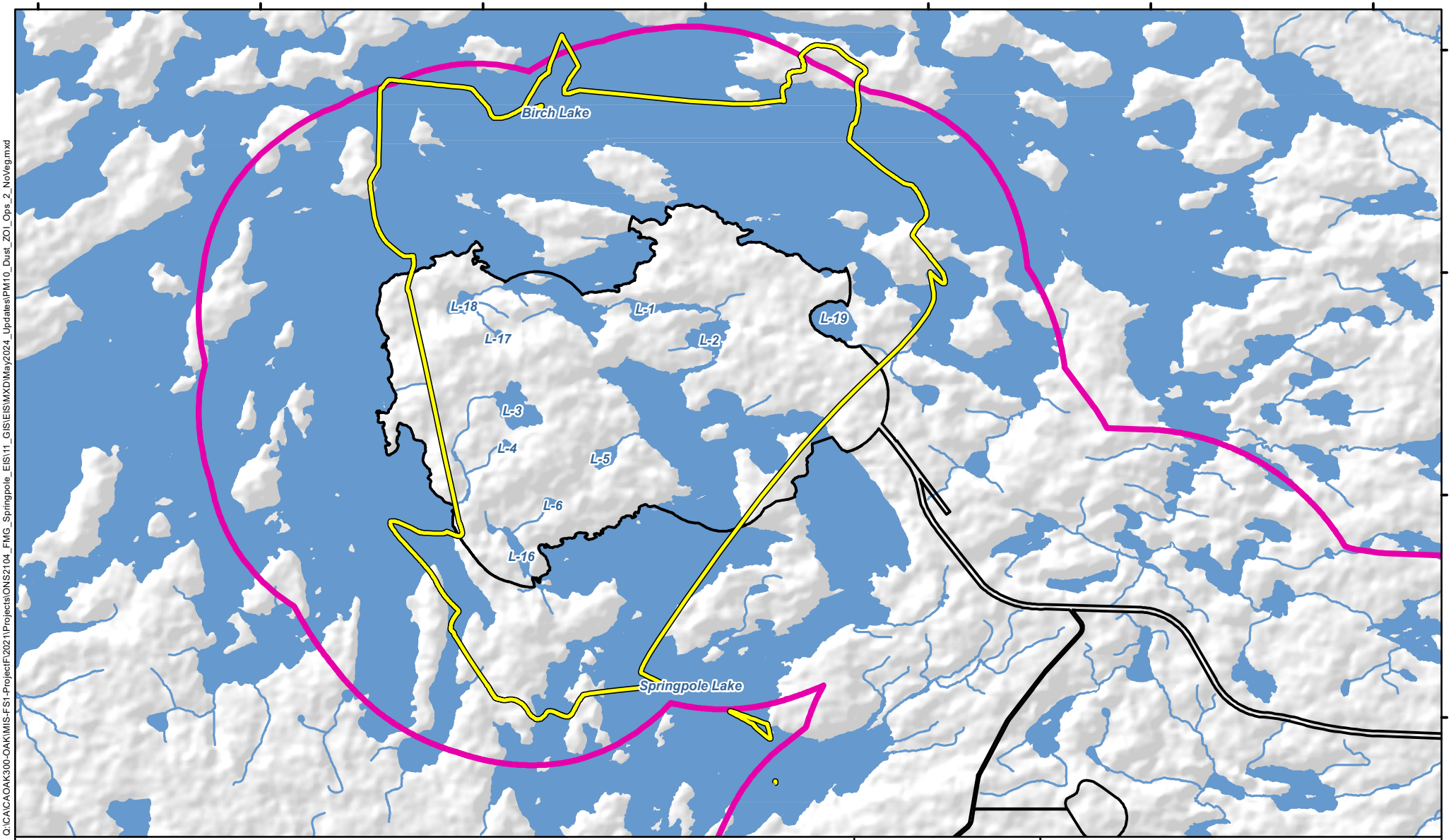
First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Groundwater Drawdown Zone of Influence during Operations

PROJECT N°: ONS2104	**FIGURE: 6.15-2**
SCALE: 1:60,000	DATE: June 2024



Q:\CA\CAOAK300-OAK\MIS-FS1-Project\FI2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\EIS\MXD\May2024_Updates\PM10_Dust_ZOI_Ops_2_NoVeg.mxd

LEGEND

- Proposed Mine Feature
- PM10 Concentration (µg/m3), 85% Dust Control, 5.8% Silt, Project and Baseline Effects
- Local Study Area for Bats
- Waterbody
- Watercourse

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan current as of Oct. 30, 2023

Disclaimer for PM10 Concentration (µg/m3) shown:
- Predicted effects should be considered in the context of the conservative nature of the emission rate estimates (all sources active at the maximum all the time, activity levels for all years at the maximum year of operations) and the conservative modelling (worst-case meteorological conditions over five years of meteorological data.
- For the low dust control and higher silt, only the Fish Harvest sensitive receptor predicts exceedances and only 0.3% of the time (6 days) ion a 5-year period. All exceedances for the fish harvest were predicted in December and January.

0 0.5 1 2 3 4 5 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Extent of Modelled Air Emissions from the Project

PROJECT N°: ONS2104

FIGURE: 6.15-3

SCALE: 1:60,000

DATE: June 2024

540000 560000 580000 600000 620000

5700000

5680000

5660000

Gitche Lake

Zionz Lake

Birch Lake

Springpole Lake

Seagrave Lake

Gull Lake

Fawcett Lake

Kezik Lake

Fry Lake

SLATE FALLS NATION

Bamaji Lake

Jeanette Lake

Blackstone

X:\CA\CAOAK300-OAK\MIS-FS1-Project\P2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\TerrestrialBird_HSM_HSI_Models\MXD_Maps\Noise_Impact_ZOI_5.mxd

LEGEND

- Proposed Mine Feature
- Project Development Area
- Local Study Area for Bats
- Regional Study Area for Bats
- Noise Impact Zone of Influence (June 2024 model) * Existing Road
- Existing Winter Road
- First Nation Reserve
- Existing Transmission Line
- Watercourse
- Waterbody

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
* Outer boundary of 40 dBA contours within continuous noise areas (mine site and access road)

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold

wsp

SPRINGPOLE GOLD PROJECT

Extent of Modelled Noise Emissions from the Project

PROJECT N°: ONS2104 | **FIGURE: 6.15-4**

SCALE: 1:220,000 | DATE: October 2024

500000 520000 540000 560000 580000 600000 620000 640000 660000

5700000 5680000 5660000 5640000 5620000

Carillon Lake
Kapikik Lake
Gitche Lake
Dobie Lake
Meen Lake
Zionz Lake
Birch Lake
Fawcett Lake
Wright Lake
Shabumeni Lake
Obaskaka Lake
Gull Lake
Bertha Lake
Kezik Lake
Fry Lake
Trout Lake
Woman Lake
Narrow Lake
Okanse Lake
Joyce Lake
Perrigo Lake
Confederation Lake
Sesikinaga Lake
Bamaji Lake
Jeanette Lake
Uchi Lake
Blackstone Lake
Lake St. Joseph
Doran Lake
Slate Lake
Whitemud Lake
Otatakan Lake
Bluffy Lake
Churchill Lake
Miniss Lake
St. Raphael Lake
De Lesseps Lake
Wenasaga Lake

SLATE FALLS NATION

M3 C37 M5 D1 C36 D12 C13 C32 M1 C13 SW1 C12 C12 D4 C10 D3 SW6 C5 C5 W6 C14 C9 C4-22 Control 99 SW9 D2 Control 3 D7 Control 2 C11 C17 D6 C19 C19 C16 C16 NE5 NE6 C14 C15 NE2 NE1 D13 D8 B19 A10 W1 C26A Control 1 C12 A6 C16 SE1 C24 C20 A13 SE6 SE7 D5 D11 D3

LEGEND

- Proposed Mine Feature
- Project Development Area
- Species at Risk Bat Local Study Area
- Species at Risk Bat Regional Study Area
- Bat Maternity Habitat Survey Locations (2023 ARU) (Labelled with ID)
- Bat Maternity Habitat Survey Locations (2022 ARU) (Labelled with ID)
- Bat Maternity Habitat Survey Locations (2021 ARU) (Labelled with ID)
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- First Nation Reserve
- Watercourse
- Waterbody

NOTES:
- Topographic information extracted from LIO, MNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

0 10 20 40 60 80 100 Kilometres

First Mining Gold

WSP

SPRINGPOLE GOLD PROJECT

Bat Maternity Roost Habitat and ARU Stations

PROJECT N°: ONS2104 | **FIGURE:** 6.15-5

SCALE: 1:430,000 | DATE: May 2024

480000 500000 520000 540000 560000 580000 600000 620000

5700000 5680000 5660000 5640000

Graham Lake
Richardson Lake
Carillon Lake
Casummit Lake
Penson Lake
Keigat Creek
Birch Lake
Dole Lake
Springpole Lake
2 Km

Kapikik Lake
Bertrand Lake
McVicar Lake
Carillon Lake
Gitche Lake
Meen Lake
Dobie Lake
Birch Lake
Zionz Lake
Fawcett Lake
Gull Lake
Kezik Lake
Obaskaka Lake
Seagrave Lake
Bertha Lake
Fry Lake
Okanse Lake
SLATE FALLS NATION
North Bamaji Lake
Perrigo Lake
Sesikinaga Lake
Bamaji Lake
Jeanette Lake
Uchi Lake
Blackstone Lake
Lake St. Joseph
Otatakan Lake

Q:\CA\CAOAK300-OAK\MIS-FS1-Project\P2021\Projects\ONS2104 FMG Springpole EIS\11 GIS\EIS\MXD\May2024 Updates\SAR Bat 3.mxd

LEGEND

- Proposed Mine Feature
- Proposed 230 kV Transmission Line
- Local Study Area for Bats
- Regional Study Area for Bats
- First Nation Reserve
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- Watercourse
- Waterbody
- Little Brown Myotis (Wood 2021)
- Bat Maternity Colony Habitat

0 5 10 20 30 40 50 Kilometres

NOTES:
- Topographic information extracted from LIO, NDMNRF.
- Proposed site plan provided by Ausenco, drawing number 105877-0000-G-001, Rev C. 29 July 2021.
- Co-Disposal Facility provided by Knight Piésold Ltd., 27 September 2021.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

First Mining Gold | WSP

SPRINGPOLE GOLD PROJECT

Species at Risk Bat Maternity Habitat and Confirmed Presence

PROJECT N°: ONS2104 | **FIGURE: 6.15-6**

SCALE: 1:400,000 | DATE: May 2024

460000 480000 500000 520000 540000 560000 580000 600000 620000

5700000 5680000 5660000 5640000 5620000

Q:\CA\CA\OAK300-OAK\MIS-FS1-Project\F2021\Projects\ONS2104_FMG_Springpole_EIS\11_GIS\EIS\MXD\May2024_Updates\BatHibernacula_Surveys_and_ARU_2.mxd

Pringle Lake
Birch Lake
Dole Lake
Springpole Lake (L-15)
L-1
L-2
L-3
L-4
L-6
L-16
L-17
L-18
L-19
L-20
Cliff6-Control
Cliff 6-control
Cliff6
Cliff 6
Cliff 6-control2
Cliff 6-control
2
Km

Carillon Lake
Kapikik Lake
Zionz Lake
Gull Lake
Bertha Lake
Kezik Lake
Fry Lake
Perrigo Lake
Sesikinaga Lake
Jeanette Lake
North Bamaji Lake
Bamaji Lake
Blackstone Lake
Slate Lake
Lake St. Joseph
Otatakan Lake
Churchill Lake
St. Raphael Lake
Dobie Lake
SLATE FALLS NATION
M6-2
M6-1
M5-1
M3-1
M3-6-Control
M3-2-1
M6-2
M5
M3-6-control
M5-1
M6
M2
M2
A1
M6-1
M3-2
M2
M3-6-control
M2 control
M2-Control
Cliff6 ntrol2
Cliff 6-control
Cliff
Cliff 1-control2
M7
M9
M8
Cliff5
Cliff 2-2
Cliff2-1
Cliff2
Cliff2-2
Cliff2-control
Cliff 2-1
Cliff4
Cliff3
Cliff3
Cliff 3
Cliff 3-control
Cliff
1-1
Cliff1-3
Cliff
1-3
Cliff 1-2
Cliff1-2
Cliff1-4
Cliff
1-9
Cliff
1-control
Cliff1-1
Cliff1-5
Cliff
1-control4
Cliff
1-control2
Cliff1-6
Cliff1-control
Cliff1-10
Cliff 1-3
Cliff 1-9
Cliff 1-10
Cliff 1-1
Cliff 1-8
Cliff 1-2
Cliff
1-6
Cliff 1-7
Cliff 1-3
Cliff 1-7
Cliff 1-4
Cliff 1-6
Cliff 1-5
Cliff
1-4
Cliff 1-5
1
Km

LEGEND

- Proposed Mine Feature
- Project Development Area
- Species at Risk Bat Local Study Area
- Species at Risk Bat Regional Study Area
- Bat Hibernacula Detector Survey Locations (2023) (labelled with ID)
- Bat Hibernacula Detector Survey Locations (2022) (labelled with ID)
- Bat Hibernacula Detector Survey Locations (2021) (Labelled with ID)
- Bat Hibernacula Survey Locations (Fall 2021) (Labelled with ID)
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- First Nation Reserve
- Watercourse
- Waterbody

NOTES:
- Topographic information extracted from LIO, MNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.
- Bat detector survey locations (2011-2019) conducted by NorthWinds Environmental Services.

Datum: NAD83
Projection: UTM Zone 15N

0 10 20 40 60 80 100 Kilometres

FIRST MINING GOLD

WSP

SPRINGPOLE GOLD PROJECT

Bat Hibernacula Surveys and ARU Stations

PROJECT N°: ONS2104 | **FIGURE:** 6.15-7

SCALE: 1:430,000 | DATE: May 2024

500000 520000 540000 560000 580000 600000 620000 640000 660000

5700000 5680000 5660000 5640000 5620000

M5 M3 M6 Cliff1

Birch Lake Zionz Lake Fawcett Lake Gull Lake Kezik Lake Bertha Lake Shabumeni Lake Woman Lake Narrow Lake Okanse Lake Joyce Lake Confederation Lake Perrigo Lake Sesikinaga Lake Jeanette Lake Uchi Lake Bamaji Lake Fry Lake Obaskaka Lake Wright Lake Meen Lake Dobie Lake Gitche Lake Blackstone Lake Lake St. Joseph Doran Lake Miniss Lake Churchill Lake St. Raphael Lake De Lesseps Lake Slate Lake Whitemud Lake Bluffy Lake Otatakan Lake

SLATE FALLS NATION

O:\CA\CAOAK300-OAK\MIS-FS1-ProjectF\2021\Projects\ONS2104 FMG Springpole EIS\11 GIS\EIS\MXD\May2024 Updates\Bat Habitat Map 2.mxd

LEGEND

- Proposed Mine Feature
- Project Development Area
- Species at Risk Bird Local Study Area
- Species at Risk Bird Regional Study Area
- Existing Road
- Existing Winter Road
- Existing Transmission Line
- First Nation Reserve
- Watercourse
- Waterbody
- Bat Candidate Hibernacula (labelled with ID)
- Bat Maternity Habitat
- Bat Foraging Habitat

Confirmed SAR Bat Detections (2021 to 2023)

- Little Brown Myotis and Northern Myotis
- Little Brown Myotis
- Little Brown Myotis and Unknown Myotis
- Unknown Myotis

NOTES:
- Topographic information extracted from LIO, MNRF.
- Proposed site plan provided by Ausenco, drawing number 104496-GX-03000-31344-003, Rev 1. 26 June 2023 and modified by WSP July 2023.

Datum: NAD83
Projection: UTM Zone 15N

0 10 20 40 60 80 100 Kilometres

N W E S

First Mining Gold

wsp

SPRINGPOLE GOLD PROJECT

Bat Habitat Summary Map

PROJECT N°: ONS2104 | **FIGURE:** 6.15-8

SCALE: 1:430,000 | DATE: May 2024

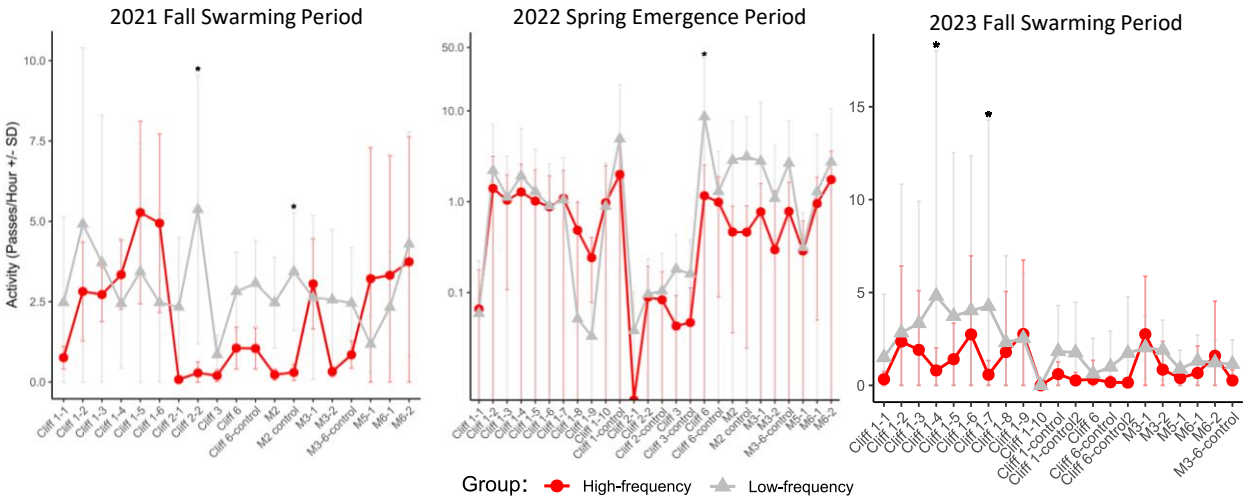


Figure 6.15-9: Average Cumulative Activity of High-Frequency and Low-Frequency Bat Species

Note:
Measured in passes per hour, with standard deviation.
At abandoned mine and cliff sites in the area in the vicinity of the Project that were determined to be potentially suitable overwintering features for bats. Meaningful differences in activity between high-frequency and low-frequency groups at each site are denoted with an asterisk (*). Activity for 2022 spring emergence (middle panel) is represented on the log scale due to the large standard deviation for low-frequency bats at Cliff 6.

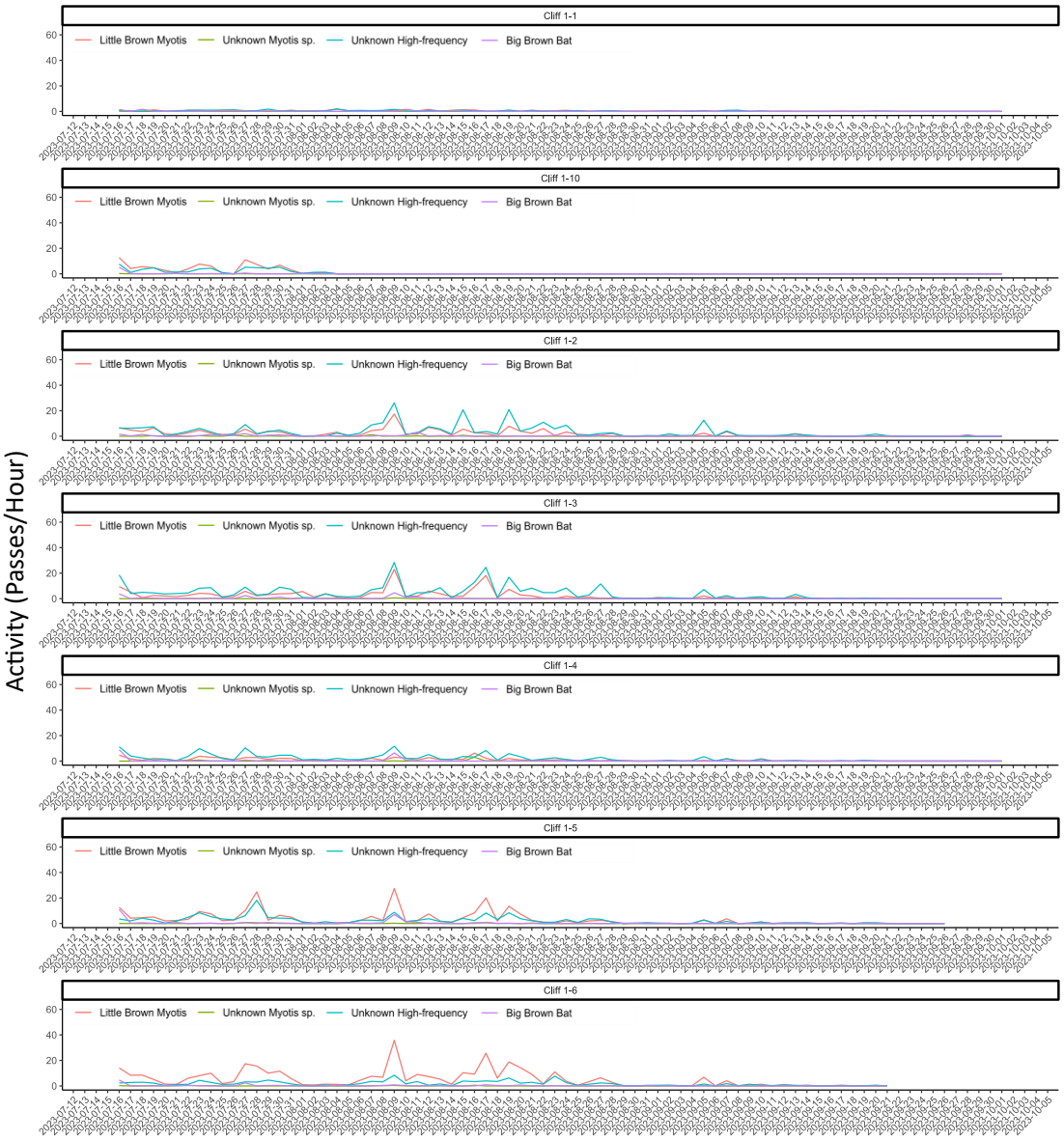


Figure 6.15-10: Nightly Activity of Hibernating Species at Each Survey Station During the 2023 Candidate Hibernacula Surveys (Part 1)

Note:
Auto-classifications of Big Brown Bat are included as Big Brown Bat is a hibernating species. However, auto-classifications to Big Brown Bat were not manually vetted so presence of this species is not confirmed for 2023 candidate hibernacula surveys.

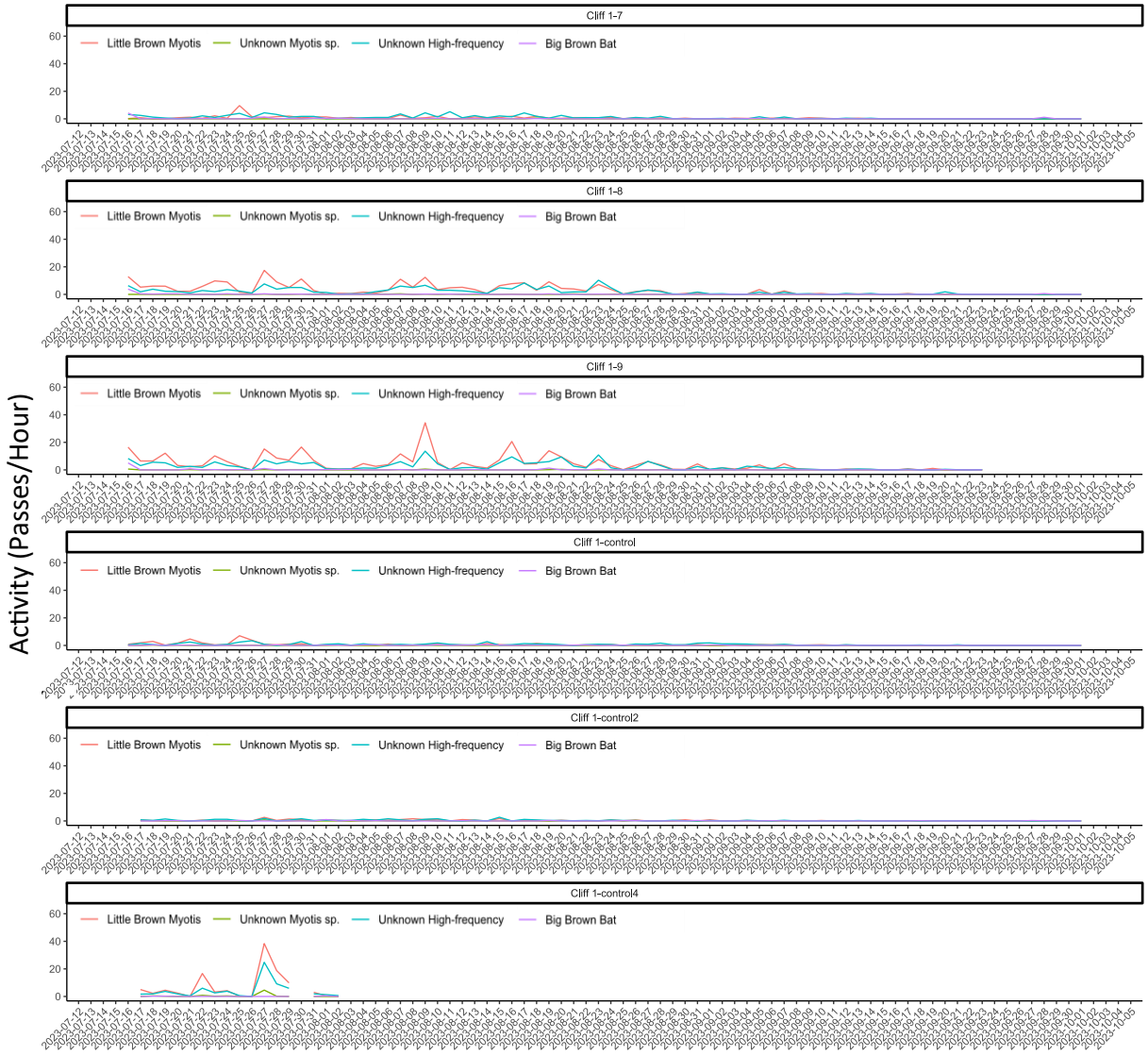


Figure 6.15-11: Nightly Activity of Hibernating Species at Each Survey Station During the 2023 Candidate Hibernacula Surveys (Part 2)

Note:
Auto-classifications of Big Brown Bat are included as Big Brown Bat is a hibernating species. However, auto-classifications to Big Brown Bat were not manually vetted so presence of this species is not confirmed for 2023 candidate hibernacula surveys.

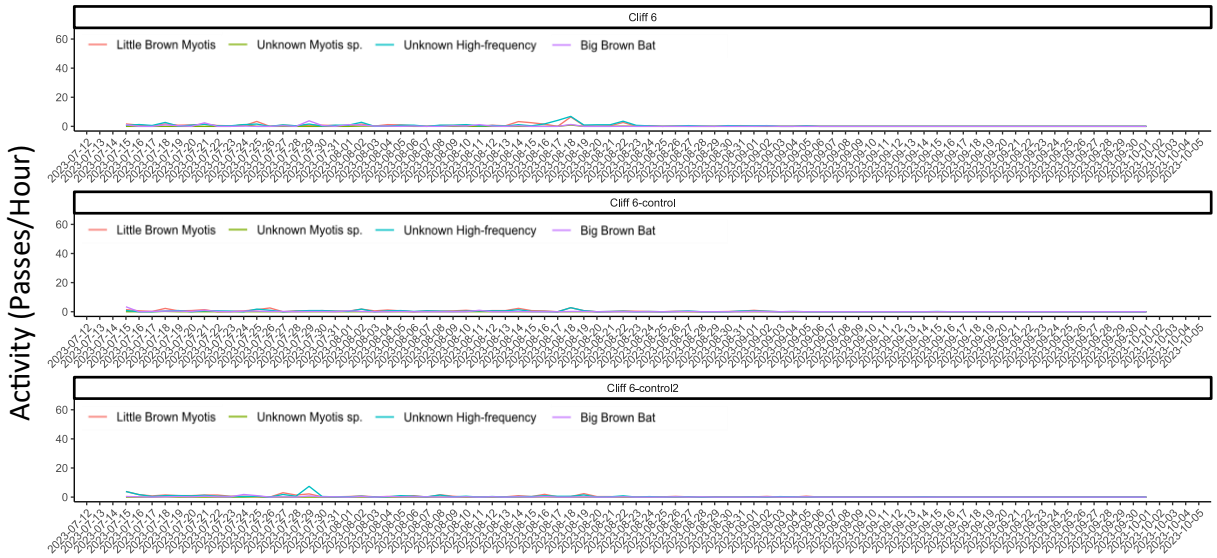


Figure 6.15-12: Nightly Activity of Hibernating Species at Each Survey Station During the 2023 Candidate Hibernacula Surveys (Part 3)

Note:
Auto-classifications of Big Brown Bat are included as Big Brown Bat is a hibernating species. However, auto-classifications to Big Brown Bat were not manually vetted so presence of this species is not confirmed for 2023 candidate hibernacula surveys.

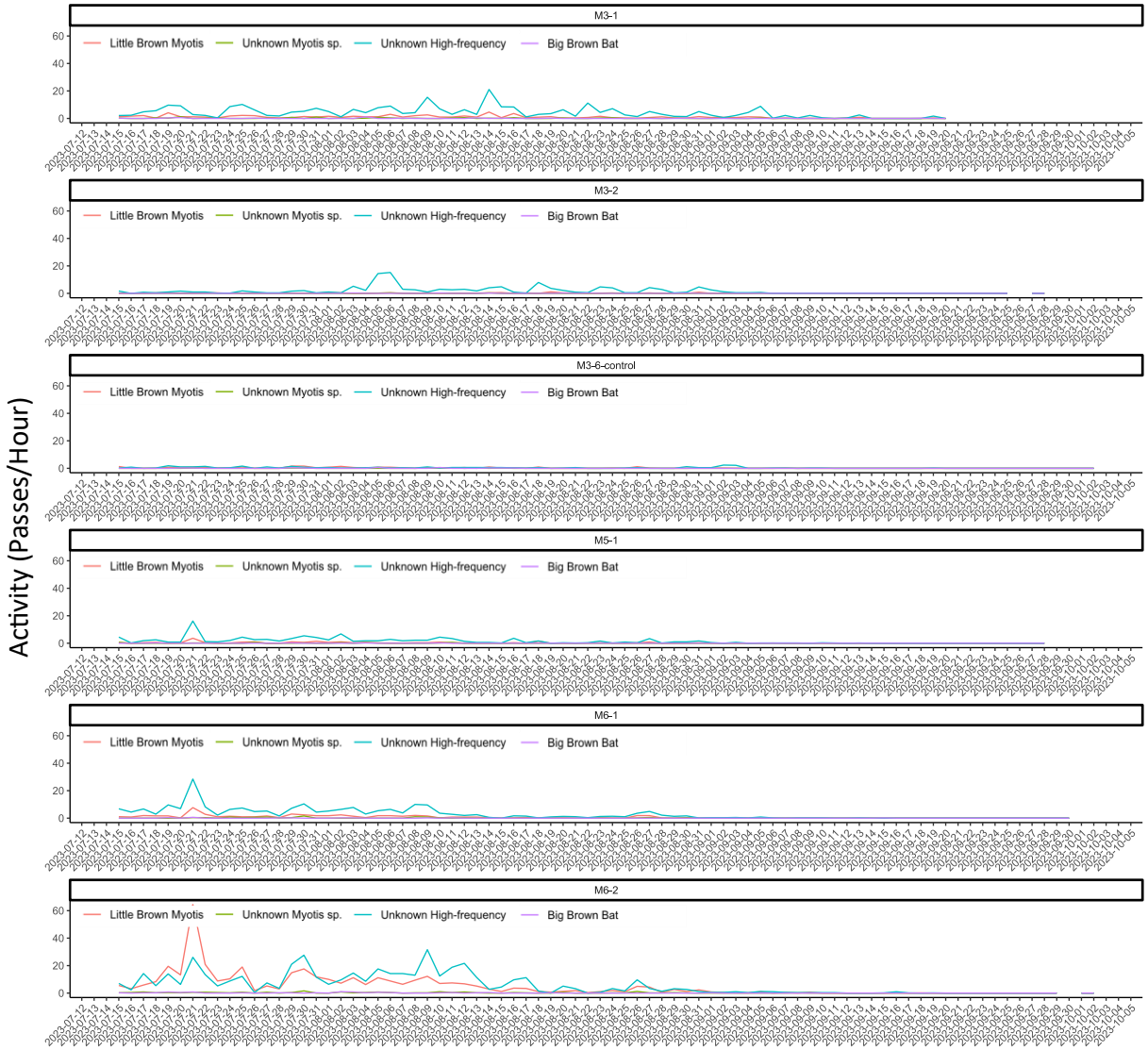


Figure 6.15-13: Nightly Activity of Hibernating Species at Each Survey Station During the 2023 Candidate Hibernacula Surveys (Part 4)

Note:
Auto-classifications of Big Brown Bat are included as Big Brown Bat is a hibernating species. However, auto-classifications to Big Brown Bat were not manually vetted so presence of this species is not confirmed for 2023 candidate hibernacula surveys.